



Kugluktuk

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

Bathurst Inlet
Kingaok

May 30th, 2022

Bay Chimo
Umingmaktok

**Re: Review of Sabina's 2021 Annual report for Back River Project
Certificate NIRB No. 007.**

Cambridge Bay
Ikaluktutiak

Dear Keith Morrison, the KIA has reviewed Sabina's 2021 Annual Report for the Back River Project Certificate NIRB No. 007.

1) Compliance Monitoring:

Gjoa Haven
Okhoktok

The KIA's Framework Agreement (FA) and Inuit Impact and Benefits Agreement (IIBA) with Sabina Gold & Silver Corp. cover terms and conditions of NIRB Project Certificate 007.

Taloyoak

The Framework Agreement is a confidential agreement between KIA and Sabina that supersedes and replaces all previous contractual arrangements between both parties. Section 3.1 of the FA covers Terms and conditions of land use license and reporting.

Kugaaruk

Appendix A of Section 3.1 of the Framework Agreement specifies the details of annual reporting by Sabina to the KIA, which is summarized as follows:

Sabina is to provide an annual report to KIA providing details of its operations under any land use License, Advanced Exploration Lease and/or Commercial Lease covering the location and operations area of lands affected, and the nature of facilities and equipment at these sites. In addition, Sabina is to provide details of progressive reclamation or closure activities undertaken during the year and details of all permits, licenses, and authorizations from other regulatory bodies or agencies that are required for operations.

This annual report is to provide information on:

- Ground disturbances including land use activities for camps, infrastructure, equipment, winter roads and trails.
- Fuel and Chemical storage including Chemicals of Potential Concern inventory (COPC), fuel and chemical usage, and spill records.
- Drilling programs, locations, and methods.
- Water use and effects on water.



- Wildlife interaction, data logs, and summaries.
- Waste disposal, waste management practices, inventory of waste on site, and inventory of hazardous materials or non-combustible waste removed from site.
- Closure and reclamation progress associated with waste management, drilling, and ground disturbance along with associated costs.
- General information on annual inspection activities by staff and other agencies and their results, community consultations, future exploration work plans, submissions to NIRB, NWB, or NPC or other regulators related to mining activity, archaeological sites and burial grounds, and any incidents of storage or possession of alcohol and drugs on site.

Sabina has provided the KIA with the **Back River Project 2021 Annual Report for KIA Framework Agreement** in accordance with Appendix A to Schedule 3.1 of the Framework Agreement. This report is separate from the **Back River Project 2021 Annual Report for Project Certificate No. 007**, which was submitted, to NIRB.

The socio-economic impact of the project on affected communities of Nunavut is covered by the IIBA, which is summarized here.

Inuit Impact and Benefits Agreement (IIBA) – Summary.

On April 20, 2018, the Kitikmeot Inuit Association (KIA) and Sabina Gold & Silver Corp. entered into a comprehensive Framework Agreement for the development of the Back River Project area, which includes the Marine Laydown Area (MLA), Winter Road, and the Goose Lake advanced exploration camp, among other exploration and development targets. The Agreement is intended to provide long-term benefit and certainty to Inuit beneficiaries, long-term development, and tenure certainty to Sabina.

One of the major features of this comprehensive agreement is a publicly available Inuit Impact and Benefit Agreement (IIBA) for activities in the Back River Project area, which addresses socio-economic interests of Inuit in the region, including employment, contracting, and training.

The purpose of the IIBA is to satisfy requirements under article 26 of the NLCA with respect to Back River Project area. It is intended by the IIBA to provide benefits to Inuit arising from Sabina's operations that may fall below the threshold of a Major Development Project.

Under the IIBA, Sabina has a commitment to inform the KIA on a regular basis on both the socio-economic and ecosystem effects of their operations in the Kitikmeot region. Socio-economic effects are to be reported on a regular and timely basis through



the IIBA Implementation Committee, Sabina Liaison, and the IIBA Manager. Ecosystem effects is be reported through the Inuit Environmental Advisory Committee (IEAC) once established.

The Implementation of the Back River IIBA and the establishment of the Back River IIBA implementation Committee is still pending a production decision by Sabina. KIA anticipates the establishment of the Back River IIBA IC this year or in 2023.

KIA met with Sabina Gold & Silver Corp., the Government of Nunavut, and Crown-Indigenous Relations and Northern Affairs Canada for the Socio-Economic Monitoring Working Group (SEMWG) on May 12, 2021.

The 2020 Socio-Economic Monitoring Report content and format was reviewed. Other matters pertaining to the socio-economic management plan, guidance for incorporating community perspectives, traditional knowledge in the monitoring program, and outfitting/guiding business consultation protocol were discussed. Future initiatives such as Inuit employee survey, stakeholder grievance mechanism, and the advancement of orientation and training programs were established.

Inspection of Back River Project

The KIA conducted its site inspection the Back River Project with its geotechnical engineering consultant, BGC Engineering Inc., from July 22 to 24, 2021. The KIA had conducted its inspection of Goose Lake Camp, the Marine Laydown Area (MLA), and George Lake Camp with Sabina staff. KIA's internal report as well as BGC Engineering Inc. inspection reports were provided to Sabina Gold & Silver Corp. for response. Sabina had acted upon observations and recommendations provided in both reports.

Internal Report on Back River Project – July 22 to 24, 2021

Summary

The inspection of Goose Lake Camp, Marine Laydown Area (MLA) facilities, and George Lake Camp was conducted from July 22 to 24 as per established inspection schedule. John Roesch of KIA, Lukas Arenson of BGC Engineering and Merle Keefe of Sabina Gold & Silver Corp. had conducted the inspection. Eighty (80) site components out of 82 components were inspected in accordance with KIA's established schedule at all three locations.

Photographs were taken of the inspected mine site components and along with some aerial photographs by KIA and BGC Engineering. Photographs were also provided by Sabina Gold & Silver Corp. of the MLA.



Overall, the Goose Lake Camp and MLA are being maintained in good condition while operating during the COVID-19 pandemic. There has been considerable expansion at the Goose Lake Camp with the construction of the access road to Umwelt which contains two temporary bridges and culverts at Echo crossing. There is considerable development at Umwelt consisting of an underground portal, service shop, diesel generators, transformers, cold storage, quarry, temporary ANFO, and pad development for mine site accommodations.

The Umwelt access road requires further development and must be raised to 1.5 metres in height with permanent bridges installed. Three additional culverts must be added to Echo crossing to improve water flow during freshet. There is cracking and slumping by the generators at Umwelt which needs to be fixed with the pad built up. There is a temporary saline pond for recirculated mine water at the portal. This will be replaced by a C-Can tank.

The MLA is in very good condition and only needs its pads and roads regraded. The George Lake Camp is in fair condition given that it is closed. It needs to be reorganized and cleaned up with damaged tents replaced.

If the camp is to be re-opened and expanded for advanced exploration, Sabina should construct a new and larger airstrip away from the existing camp and repurpose the existing airstrip as a pad for a reorganized expanded camp. The current arrangement with the camp and stored equipment on either side of the airstrip constitute a hazard to aircraft and personnel.

In addition to this report, a report by BGC Engineering Inc. has been prepared complete with observations and recommendations. The report by BGC Engineering Inc. is included to supplement this report.

Both reports will be provided to Sabina for feedback on KIA's inspection.

Compliance Status

In 2021, Sabina Gold & Silver completed several activities such as:

- Major progress in project funding;
- Sampling, discharge, and maintenance of fuel storage areas at the MLA and Goose Lake Camp;
- Extending the Goose all-weather airstrip to allow aircraft of different sizes to land year-round with an increased degree of success;
- Goose site road network expansion, including watercourse crossing towards the Llama deposit;



- Initial construction of a 10M litre fuel tank and containment at Goose Lake Camp, and final construction of the 10M litre fuel tank and containment at the MLA;
- Additions to Goose site infrastructure including laydown areas, such as:
 - Process Plant Pad Area construction.
 - Exploration Decline Portal Ramp construction and advancement, completed bolting and screening of portal entrance, constructed supporting laydown pads and shops;
- Geotechnical drilling at Goose; and
- Environmental monitoring and baseline programs including atmospheric, archaeology, water quality, fisheries, wildlife, geotechnical, and vegetation programs.

Sabina is proceeding to make a full construction decision due to major advancement in their financing. As of this year, Sabina has made full payment to KIA for land access under the Framework Agreement in preparation for implementation of the Back River IIBA and the establishment of the Inuit Environmental Advisory Committee (IEAC). The KIA anticipates that full construction will commence in 2023 with continued on-going exploration. Overall, Sabina Gold & Silver Corp. is following its permits, licenses, and agreements.

However, several project certificate conditions are considered to be only partially compliant by KIA's wildlife consultant whereas our other consultants find that Sabina has presented adequate information to demonstrate that the Back River Project has complied with project certificate terms and conditions.

Several of our wildlife consultants issues have been brought up in previous reviews of the Back River Annual Reports to NIRB and KIA will seek to address these identified issues with Sabina as the project moves forward.

2) Effects of Monitoring:

a) Whether the conclusions reached by Sabina in the 2021 Annual Report Are Valid.

KIA's consultants in the areas of wildlife, fisheries, water quality, and geotechnical engineering reviewed the 2021 Annual Report for Back River Project Certificate NIRB no, 007 and the following documents:

- Appendix A. Figures



- Appendix B. Sabina's Back River Blasting Plan for Plant Site.
- Appendix D. Vegetation Monitoring Program.
- Appendix E. Business Development Plan.
- Appendix F. 2021 Pre-Construction Wildlife Mitigation and Monitoring Plan.
- Appendix G. Oil Pollution Emergency Plan.
- Appendix K. Tailings Management Plan.

As well as:

- Water Management Plan;
- Waste Rock Management Plan;
- Operation Management and Monitoring Plans; and
- 2021 Geotechnical Annual Report.

Overall, most of our consultants find Sabina's conclusions in the 2021 Annual Report are valid, with the exception of our wildlife consultant.

Sabina has presented adequate information to demonstrate the Back River Gold Mine Project has complied with project certificate terms and conditions to most of our consultants, whereas KIA's wildlife consultant considers several project certificate conditions to be only partially compliant.

KIA notes that Sabina is currently updating the AEMP based on Technical and Public Hearing process and to align the program with the Metal and Diamond Mining Effluent Regulations (MDMER) and incorporating recommendations from the aquatic baseline synthesis report. It was therefore not included in the Annual Report. The full AEMP is expected to be implemented when discharge activities start, with results submitted annually thereafter.

Sabina stated that the following additional baseline data collection was conducted in 2021 to address the commitments made in response to technical comments on the AEMP, by KIA, Crown-Indigenous Relations and Northern Affairs Canada (CIRNAC), and Environment and Climate Change Canada (ECCC):

- Ice-cover and open-water, water quality in Goose Lake, and Reference B Lake;
- Open-water, water quality in Goose Lake streams;
- Sediment and benthic macroinvertebrate community in Propeller Lake;
- Fish health and fish tissue chemistry of Lake Trout (*Salvelinus namaycush*) in Goose and Propeller Lakes; and



- Fish health and fish tissue chemistry on Slimy Sculpin (*Cottus cognatus*) in Propeller Lake.

The baseline data collected under the amended AEMP was not disclosed in the 2021 Annual Report. An overarching request of this review is that a data report summarizing the results of AEMP monitoring be included in future reporting. Without this information, the KIA cannot determine whether the AEMP meets the objectives of the project certificate condition.

In reviewing the annual report, the KIA also notes that no tailings storage facilities, waste rock piles, or landfill have been constructed in 2021 and therefore no reporting is required. However, even though project certificate condition 13 is not applicable, it should have been included in the report.

Also, for project certificate condition 17, the Tailings Management Plan (November 2020), appended to the 2021 Annual Report, was approved by the NWB with the issuance of the amended Licence 2AM-BRP1831. However, no tailings have yet been produced for which testing results would be available.

For project certificate condition 18, it is understood that no geotechnical drilling program has been undertaken with a focus on the Tailings Storage Facility (TSF) Containment Dam. Further, Sabina will complete the remaining infill geotechnical drill program as part of additional characterization carried out immediately prior to TSF Dam construction, if constructed. Sabina noted that its currently approved mine plan no longer contains a TSF structure and associated dam.

For project certificate condition 20, no construction has been initiated and therefore, the thermal monitoring plan has not been developed. This needs to be addressed once construction is initiated.

Concerning project certificate condition 28, Sabina did not construct and operate the WIR in the 2020-2021 season. Since the WIR 2021-2022 was still in operation at the time of the 2021 Annual Report preparation, cumulative volumes of water used are not yet available, but will be reported in the 2022 Annual Report

As noted above, KIA's wildlife consultant considers that several project certificate conditions are not fully compliant but are only partially compliant. These project certificate conditions are 12, 13, 32, 34, 35, 36, 37, 45, 48, 49, 50, 53, 54, 55, 56, 58, 60, 64, and 89.



Our wildlife consultants comments and recommendations concerning these project certificate conditions will be presented in the next section of our response to NIRB.

- b) **Any areas of significance requiring further supporting information or changes to the monitoring program, which may be required.**

1.0 Back River 2021 Annual Report

1.1 KIA-NIRB-01

Review Comment Number	KIA-NIRB-01
Subject/Topic	Surveys for wildlife prior to construction
References	<p>Sabina, Back River Project 2021 Annual Report (March 31, 2022)</p> <ul style="list-style-type: none"> • Project Certificate Condition No. 45 • Appendix F. 2021 Pre-Construction Wildlife Mitigation and Monitoring Program Report (March 2022)
Summary	<p>Project Condition 45 of the Project Certificate 007 states that <i>“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.”</i> However, there is not any discussion of the measures taken with regards to wildlife crossings or denning sites for the construction of site infrastructure in 2021.</p>
Detailed Review Comment	<p>Within the 2021 Annual Report, pages 4-91 and 4-92, Sabina describes their compliance activity in 2018-2020 as it pertains to the winter ice road (WIR), including surveys for denning sites prior to road construction and comparing caribou movement via collar data during 2019, when the WIR was constructed, to 2017 and 2018 collar data, when a WIR was not constructed. Sabina then states that the WIR was not constructed in 2021, concluding their statement. However, there is no discussion of surveys undertaken for expansion of the road network to the northwest of the Goose site, which according to Sabina in the Annual Report (page 3-1, and Appendix F Figure 3.2-1) includes watercourse crossings. There is no discussion of potential denning sites or safe wildlife crossings in the footprint of 2021 construction of project infrastructure.</p>
Recommendation/Request	<p>The KIA requests the following:</p> <ul style="list-style-type: none"> • Please describe the efforts undertaken to avoid, mitigate, restore, or offset effects of 2021 construction on wildlife and



	<p>wildlife denning sites.</p> <ul style="list-style-type: none"> • Please clarify whether wildlife surveys (including caribou collar monitoring and den surveys) were conducted prior to road network expansion at the Goose site or provide rationale as to why surveys were not needed. • If no wildlife surveys were conducted, please explain how the road network expansion was constructed to allow for the safe passage of caribou and other terrestrial wildlife, and to avoid interfering with wildlife denning sites.
Importance of Issue	Low

1.2 KIA-NIRB-02

Review Comment Number	KIA-NIRB-02
Subject/Topic	Terrestrial Environment – Sensitive Landform Mitigation and Monitoring
References	<p>Sabina, Back River Project, 2021 Annual Report (March 31, 2022)</p> <ul style="list-style-type: none"> • Project Certificate Condition No. 13 <p>Sabina, Back River Project, 2020 Annual Report (March 31, 2021)</p> <ul style="list-style-type: none"> • Project Certificate Condition No. 13
Summary	<p>Project Condition 13 of the Project Certificate 007 states that <i>“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.”</i></p> <p>Reporting requirements for Project Condition 13 of the Project Certificate 007 states that <i>“During construction, the Proponent shall, on an annual basis, provide information regarding the results of additional geotechnical investigations undertaken and any associated mitigation and monitoring measures implemented by the Proponent in the Proponent’s annual report to the Nunavut Impact Review Board.”</i> However, there is not any discussion of the results of identifying sensitive landforms, modifying engineering design for project infrastructure, or development / implementation of mitigation or monitoring measures regarding the impacts of project activities and development on sensitive landforms.</p>



<p>Detailed Review Comment</p>	<p>Within Sabina’s 2020 Annual Report, page 4-31, Sabina makes the statement, “Sabina is required to have an annual geotechnical inspection completed by a Geotechnical Engineer of all major earthworks, between July and September. The inspection must be conducted in accordance with the Canadian Dam Safety Guidelines where applicable. This is a requirement of the Back River Project Type A Water License 2AM-BRP1831 (Part I, Item 10). <i>“Sabina will be completing this annual geotechnical inspection in 2021.”</i> In Sabina’s 2021 Annual Report for Project Condition 13 (page 4-34), Sabina states that the inspection was completed in 2021.</p> <p>The results of the geotechnical inspection are not a part of Sabina’s 2020 or 2021 Annual Reports to the NIRB, nor is there a discussion of results, monitoring, or mitigation measures.</p> <p>According to statements by Sabina as noted above, geotechnical inspections appear to be limited to major earthworks. However, it is not clear as to the definition of “major earthworks.” Project infrastructure is likely not exclusive to major earthworks, and PC 13 applies to identifying sensitive landforms prior to construction as well as monitoring project impacts on sensitive landforms. Sabina has not reported results of monitoring sensitive landform conditions for any Project infrastructure. If geotechnical inspections are limited to major earthworks, there must be other monitoring techniques in place for other aspects of project infrastructure.</p> <p>In addition, Sabina’s 2021 Annual Report (page 4-34) includes the statement <i>“Currently, Sabina has not constructed any waste or waste managed infrastructure where permafrost monitoring thermistors can be installed to assess thermal conditions,”</i> and further discussion of thermal monitoring. However, Project Condition 13 applies to all sensitive landforms, not exclusively permafrost. There is no discussion of monitoring or mitigation for non-permafrost sensitive landforms.</p>
<p>Recommendation/Request</p>	<p>The KIA requests the following:</p> <ul style="list-style-type: none"> • Please provide the results of the geotechnical inspection(s), including how the inspection relates to fulfilling PCs 11-13 and specifically to sensitive landforms, along with the results of monitoring and identifying mitigation measures. • Please describe investigations, monitoring, and mitigation for non-permafrost sensitive landforms relative to all project infrastructure.



Importance of Issue	Moderate
----------------------------	----------

1.3 KIA-NIRB-03

Review Comment Number	KIA-NIRB-03
Subject/Topic	Wildlife and Wildlife Habitat – Wildlife Mitigation Measures
References	<p>Sabina, Back River Project, 2021 Annual Report (March 31, 2022)</p> <ul style="list-style-type: none"> • Project Certificate Condition No. 48 • Appendix F. 2021 Pre-Construction Wildlife Mitigation and Monitoring Program Report (March 2022) <ul style="list-style-type: none"> o Appendix 5C. Wildlife Safety Site Audit Report, August 2021 (March 2022) o Appendix 5D. Waste Management SOP – Pre-Construction, Construction, and Operations: ENVIRO-08 (Version C.1, 14 March 2022)
Summary	<p>Project Condition 48 of the Project Certificate 007 states that <i>“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.”</i></p> <p>Reporting Requirements for Project Condition 48 of Project Certificate 007 states that <i>“Information regarding mitigation measures implemented and / or updated by the Proponent in fulfillment of this Term and Condition shall be included in Wildlife Mitigation and Monitoring Program Plan (WMMPP) and in the Proponent’s annual report to the Nunavut Impact Review Board.”</i> However, mitigation measures implemented after deficiencies were found during a 2021 site audit have not been reported.</p>
Detailed Review Comment	<p>The Waste Management SOP includes preventative measures to, <i>“... prevent wildlife from becoming food conditioned and habituated to the site”</i> (page 3, Appendix 5D of Appendix F of the Back River 2021 Annual Report). These preventative measures include:</p> <ul style="list-style-type: none"> • No littering (page 3 of Appendix 5D of Appendix F of the Back River 2021 Annual Report) • Bear-proof containers must be tightly secured at all times (page 3 of Appendix 5D of Appendix F of the Back River 2021 Annual Report) • Buildings and facilities are designed to exclude wildlife, with skirting under the building, screens over vents and doors sufficient to exclude inquisitive wildlife (Page 4 of



	<p>Appendix 5D of Appendix F of the Back River 2021 Annual Report)</p> <ul style="list-style-type: none"> • If wildlife is able to access buildings through damaged skirting, then skirting will be repaired immediately (Page 4 of Appendix 5D of Appendix F of the Back River 2021 Annual Report) <p>In addition, the Waste Management SOP also includes waste storage requirements for project-generated waste (page 5 of Appendix 5D of Appendix F of the Back River 2021 Annual Report), including:</p> <ul style="list-style-type: none"> • All food-related or food-contaminated waste must be stored indoors. <p>The Waste Management SOP also includes a section on waste management audits and reporting:</p> <ul style="list-style-type: none"> • The Environment department will report the incidental wildlife observations, wildlife-waste interactions, and any implemented mitigation in the annual Wildlife Mitigation and Monitoring Program (WMMP) report (page 10 of Appendix 5D of Appendix F of the Back River 2021 Annual Report). <p>In August of 2021, a safety site audit revealed several potential wildlife attractants, including:</p> <ul style="list-style-type: none"> • Several buildings with missing or damaged skirting • Food items left unattended outside after meals • Doors propped open and/or unable to close <p>(Appendix 5C. Wildlife Safety Site Audit Report, August 2021 (part of Appendix F. 2021 Pre-Construction Wildlife Mitigation and Monitoring Plan of Back River Project 2021 Annual Report))</p> <p>The results of this site safety audit were briefly discussed in the WMMPP report (page 5-10), but responses to the deficiencies and mitigation measures to prevent recurrence of deficiencies have not been reported.</p>
Recommendation/Request	<p>The KIA requests the following:</p> <ul style="list-style-type: none"> • Please provide description of mitigation measures taken in response to the deficiencies found during the 2021 site audit report, including measures to prevent recurrence of deficiencies. • Please clarify if the recommendations in the Wildlife Safety Audit Report were implemented.
Importance of Issue	Low

1.4 KIA-NIRB-04

Review Comment Number	KIA-NIRB-04
------------------------------	-------------



Subject/Topic	Reporting of trends for valued ecosystem components
References	<p>Sabina, Back River Project, 2021 Annual Report (March 31, 2022)</p> <ul style="list-style-type: none"> • Project Certificate Condition No. 50 <p>Sabina, Back River Project, 2020 Annual Report (March 31, 2021)</p> <ul style="list-style-type: none"> • Project Certificate Condition No. 50 <p>Sabina, Back River Project, 2019 Annual Report (March 31, 2020)</p> <ul style="list-style-type: none"> • Project Certificate Condition No. 50 <p>Sabina, Back River Project 2018 Annual Report (April 30, 2019)</p> <ul style="list-style-type: none"> • Project Certificate Condition No. 50 <p>Sabina, Back River Project, Wildlife Mitigation and Monitoring Program Plan (Version 10), October 2019</p>
Summary	<p>Project Condition 50 of the Project Certificate 007 states, in part, that <i>“Within its annual report to the NIRB, the Proponent shall incorporate a review section which includes:</i></p> <ol style="list-style-type: none"> <i>An examination for trends in the measured natural variability of Valued Ecosystem Components in the region relative to the baseline reporting...”</i> <p>Reporting requirements for Project Condition 50 of the Project Condition 50 states that “Information regarding the Proponent’s efforts in fulfillment of this Term and Condition shall be included in the Proponent’s annual report to the Nunavut Impact Review Board.” However, there is incomplete discussion of trends for Valued Ecosystem Components (VECs).</p>
Detailed Review Comment	<p>In the 2021 Annual Report for PC 50, Sabina included the statement, <i>“Sabina is developing an initial Pre-Construction Wildlife Effects Monitoring Report to report on the pre-construction activities conducted in 2018”</i> (page 4-99). This statement is repeated verbatim in the 2020 Annual Report section for PC 50 (Page 4-90). This may be an editing error, as there is no reason that the 2018 report should still be in development. Upon further inspection, this statement also appears verbatim in the 2019 Annual Report (page 4-82) and the 2018 Annual Report (Page 4-78). However, a more concerning repeated statement between the 2018, 2019, 2020, and 2021 annual reports occurs under the heading “Trends:”</p> <p><i>“Not Applicable. This is the first year of monitoring”</i> (page 4-100, Back River Project 2021 Annual Report; page 4-91, Back River Project 2020 Annual Report; page 4-83, Back River</p>



	<p>Project 2019 Annual Report; page 4-79, Back River Project 2018 Annual Report).</p> <p>As it is unlikely that the first year of wildlife monitoring occurred in 2018, 2019, 2020, and 2021, this statement may also be an editing/copy and paste error between reports. However, since it is also unlikely that 2021 is the first year of monitoring given statements in previous Annual Reports, then an analysis and discussion of trends is appropriate.</p> <p>With regards to reporting trends, the 2021 Pre-Construction Wildlife Mitigation and Monitoring Program Report includes a presentation of habitat loss due to project activities prior to 2021 and in 2021, a discussion of the differences in number of caribou sightings by season from 2018-2021, and wildlife mortalities from 2018-2021. There is no presentation of trends information for other VECs.</p>
<p>Recommendation/Request</p>	<p>The KIA requests the following:</p> <ul style="list-style-type: none"> • Please provide an analysis of trends as required by this Project Condition. Valued Ecosystem Components (VECs) include caribou, grizzly bear, muskox, wolverine / furbearers, migratory birds (waterbirds, upland birds), raptors (e.g., falcons, eagles, hawks, ravens, and owls), seabirds and seaducks, and marine mammals (Back River Project Wildlife Mitigation and Monitoring Program Plan (Version 10), page 2-1). • If Sabina believes that there are currently insufficient data to analyze trends, please clarify the number of years of data collection necessary to analyze trends as well as a discussion of how adaptive management will proceed if trends cannot be analyzed.
<p>Importance of Issue</p>	<p>High</p>

1.5 KIA-NIRB-05

<p>Review Comment Number</p>	<p>KIA-NIRB-05</p>
<p>Subject/Topic</p>	<p>Incidental wildlife observations</p>
<p>References</p>	<p>Sabina, Back River Project, 2021 Annual Report (March 31, 2022)</p> <ul style="list-style-type: none"> • Project Certificate Condition No. 49 • Project Certificate Condition No. 43 • Appendix F. 2021 Pre-Construction Wildlife Mitigation and Monitoring Program Report (March 2022) o Appendix 4A. Incidental Caribou Observations, 2021
<p>Summary</p>	<p>Project Condition 49 of the Project Certificate 007 states, in</p>



	<p>part, that <i>“The Proponent shall report to the Nunavut Impact Review Board (NIRB) regarding its terrestrial wildlife monitoring efforts, with inclusion of the following information:</i></p> <p><i>a. ...</i></p> <p><i>b. ...</i></p> <p><i>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... “</i></p> <p>However, detailed presentation of the locations of incidental wildlife sightings has not been provided.</p>
<p>Detailed Review Comment</p>	<p>In Appendix F. 2021 Pre-Construction Wildlife Mitigation and Monitoring Program Report, part of the Back River Project 2021 Annual Report, Sabina describes incidental sightings (or lack thereof) of caribou (page 5-15), other terrestrial wildlife (page 5-16), birds (page 6-2), marine mammals (pages 7-2 and 7-11), and seabirds (pages 7-7 and 7-8). In the terrestrial mammal sections, Sabina also refers to several specific places within the Goose site or Marine Laydown Area (MLA), such as Plant Site Pad (where blasting occurred in 2021, page 5-6), accommodation buildings and “the pond near the drilling laydown (page 5-10), and the George exploration camp (page 1-1). From the report, and the maps and included information, it is frequently not clear where incidental wildlife sightings occurred in the Goose area, and it is not clear if any incidental wildlife sightings occurred at the George site.</p> <p>Specifically, in the 2021 Pre-Construction Wildlife Mitigation and Monitoring Program Report, there are summary tables of caribou (Table 5.7-2, page 5-15) and other terrestrial animal (Table 5.7-4, page 5-16) observations over the course of 2021. The caribou table includes seasons when the observations were made, but the other terrestrial mammal table does not include dates. Both tables and the accompanying discussion include “Goose” site as the location where the observation occurred. More details regarding locations of caribou sightings are included in Appendix 4A to the 2021 Pre-Construction Wildlife Mitigation and Monitoring Program Report.</p> <p>It would be helpful to provide terrestrial animal sightings in map form to help determine if areas of the project or certain infrastructure have more frequent wildlife sightings. In the marine mammal section, there is a map depicting the locations where different species of marine wildlife were spotted during shipping in 2021 (Figure 7.1-3: Incidental Marine Mammal Observations During Shipping, August and</p>



	<p>September 2021, part of Appendix F. of the Back River Project 2021 Annual Report). This type of map could be prepared to show the incidental sightings of terrestrial wildlife from workers, aircraft pilots, vehicles, etc. to consolidate all sightings, color-coded by species and year. In addition, a fine-scale map of the MLA, Goose site, and other future project sites, showing buildings and other project infrastructure, would show areas of human use that may be inadvertently serving as animal attractants and would meet the terms of PC 49.</p> <p>In addition, the incidental caribou observations report (Appendix 4A to Appendix F. of the Back River Project 2021 Annual report, no page number) includes 10 dated and one undated observations of caribou, all stated as occurring at Goose site. However, in the Performance on Ecosystemic Terms and Conditions section, in regard to Project Certificate Condition No. 43, Sabina states, <i>“During 2021, a lone male caribou continued to be observed at the MLA (page 4-89).”</i> This suggests that the incidental observations tables may not be complete as to observations occurring at the MLA or other Project sites.</p>
<p>Recommendation/Request</p>	<p>The KIA requests the following:</p> <ul style="list-style-type: none"> • Please prepare a map to provide a clear detailed distribution of terrestrial wildlife sightings in relation to project infrastructure and activities. • Please ensure that all incidental observations of caribou and other wildlife are included in the annual report. • Please explain why the observation of a lone male caribou at the MLA reported on page 4-89 was not included in the WMMPP report.
<p>Importance of Issue</p>	<p>Low</p>

1.6 KIA-NIRB-06

<p>Review Comment Number</p>	<p>KIA-NIRB-06</p>
<p>Subject/Topic</p>	<p>SOP for wildlife (carnivore) interactions and deterrents</p>
<p>References</p>	<p>Sabina, Back River Project, 2021 Annual Report (March 31, 2022)</p> <ul style="list-style-type: none"> • Appendix F. 2021 Pre-Construction Wildlife Mitigation and Monitoring Program Report (March 2022) • Project Certificate Condition No. 48 <p>Sabina, Back River Project, Responses to 2020 Annual Report Comments (July 6, 2021)</p>



	<ul style="list-style-type: none"> • Response to Kitikmeot Inuit Association, KIA-21
Summary	<p>KIA has previously requested the inclusion of the Wildlife Interaction and Deterrent SOP in response to the Back River 2019 Pre-Construction Wildlife Mitigation and Monitoring Program Report, and again in response to the Back River Project 2020 Pre-Construction Wildlife Mitigation and Monitoring Program Report (Version B.1), However, this SOP has not been provided.</p>
Detailed Review Comment	<p>The 2019, 2020, and 2021 Pre-Construction Wildlife Mitigation and Monitoring Program Reports did not include the SOP for Wildlife Interaction and Deterrents. The KIA made the initial request for this SOP in response to the Back River Project 2019 Annual Report because this SOP was used in response to an observed grizzly sow and two cubs near the MLA quarry and camp. In the Back River Project Responses to 2020 Annual Report Comments, Sabina responded to this comment and request (KIA-21, page 24), <i>“Sabina will include the SOP for carnivore interactions and deterrents in future annual reports.”</i> A similar sighting of a grizzly sow and two cubs was repeated near the Goose site in 2021 (Appendix F. 2021 Pre-Construction Wildlife Mitigation and Monitoring Program Report, part of the Back River Project 2021 Annual Report, page 5-16). In addition, one wolverine was reported within the camp perimeter in 2021 (it is unclear from the report if the sighting was in the Goose or MLA site), and that this wolverine had to be deterred from the site (Back River Project 2021 Annual Report, page 4-96). If carnivores are in proximity to the site and being deterred, then reviewing this SOP is imperative.</p> <p>In Appendix 5E: Incidental Terrestrial Mammal Observations, 2021, there is a report of a wolverine at Goose site “on shore between medic and kitchen,” and that it was “scared off.” It is unclear if this the same wolverine reported as within the camp perimeter on page 4-96. In addition, it is not reported how the wolverine was “scared off,” if it required human actions, and if personnel followed the SOP.</p> <p>Due to the repeated sightings of carnivores in proximity to both Goose site and MLA, this SOP remains highly relevant for future years into construction, operations, and subsequent phases. The KIA would like to review procedures followed for deterrence, prevention, and responses to wildlife interactions.</p>
Recommendation/Request	<p>The KIA requests the following:</p> <ul style="list-style-type: none"> • Please provide the SOP for wildlife (carnivore) interactions and deterrents as requested previously and acknowledged.



	<ul style="list-style-type: none"> • Please provide a discussion regarding the wolverine detected on 19 December 2021 that was “scared off,” including whether methods used for deterrence followed the SOP, still yet to be provided.
Importance of Issue	Moderate

1.7 KIA-NIRB-07

Review Comment Number	KIA-NIRB-07
Subject/Topic	Wildlife monitoring with cameras
References	<p>Sabina, Back River Project 2021 Annual Report (March 31, 2022)</p> <ul style="list-style-type: none"> • Appendix F. 2021 Pre-Construction Wildlife Mitigation and Monitoring Program Report (March 2022) • Project Certificate Condition No. 49 <p>Sabina, Back River Project, Wildlife Mitigation and Monitoring Program Plan (Version 10), October 2019</p>
Summary	<p>Project Condition 49 of the Project Certificate 007 states, in part, that <i>“The Proponent shall report to the Nunavut Impact Review Board (NIRB) regarding its terrestrial wildlife monitoring efforts, with inclusion of the following information:</i></p> <ol style="list-style-type: none"> <i>Description of all updates to terrestrial wildlife baseline data;</i> <i>...</i> <i>...</i> <i>Results of the annual monitoring programs, including methodologies and statistical approaches used to support conclusions drawn.”</i> <p>However, there is no discussion of the results of the pre-construction ongoing camera monitoring program.</p>
Detailed Review Comment	<p>According to the Back River Project Wildlife Mitigation and Monitoring Program Plan (Version 10) (Table 6.2-1, pages 6-6 to 6-8), the Pre-Construction phase of the project includes ongoing on-site camera monitoring to track caribou, grizzly bear, and muskox. Appendix 2A to Appendix F. 2021 Pre-Construction Wildlife Mitigation and Monitoring Program Report, part of the Back River Project 2021 Annual Report, states that the Pre-Construction phase of the project includes ongoing on-site camera monitoring to track caribou and muskox interactions with Project infrastructure. However, there is no discussion of camera deployment, data collection, discussion of results, or analysis.</p> <p>The KIA also notes that Appendix 2A does not include the complete wildlife monitoring table as presented in Table 6.2-</p>



	1 of the WMMPP. Appendix 2A only presents the first page that includes the monitoring program for caribou and some components for muskox.
Recommendation/Request	The KIA requests the following: <ul style="list-style-type: none"> • Please provide a discussion of the ongoing camera monitoring program, including mitigation and management activities undertaken in response to the findings of the camera monitoring program. • For ease of reference, please include the full overview table of wildlife monitoring programs that trigger management actions as an appendix in future WMMP reports.
Importance of Issue	Low

1.8 KIA-NIRB-08

Review Comment Number	KIA-NIRB-08
Subject/Topic	Caribou collar data analysis and range shifts
References	Sabina, Back River Project 2021 Annual Report (March 31, 2022) <ul style="list-style-type: none"> • Appendix F. 2021 Pre-Construction Wildlife Mitigation and Monitoring Program Report (March 2022) • Project Certificate Condition No. 50 Sabina, Back River Project, Wildlife Mitigation and Monitoring Program Plan (Version 10), October 2019
Summary	Project Condition 50 of the Project Certificate 007 states, in part, that <i>“Within its annual report to the NIRB, the Proponent shall incorporate a review section which includes:</i> <ol style="list-style-type: none"> <i>An examination for trends in the measured natural variability of Valued Ecosystem Components in the region relative to the baseline reporting...”</i> However, possible variability in space use and/or range shifts for caribou have not been fully explored.
Detailed Review Comment	Appendix F (2021 Pre- Construction Wildlife Mitigation and Monitoring Program Report) to the Back River Project 2021 Annual Report discusses an attempted aerial survey for caribou at the Nose Lake – Contwoyo Lake area in August 2021 (pages 5-11 to 5-13; Figure 5.6-1). The survey crew was unsuccessful, as the majority of caribou had left the survey area by 14 August (page 5-12). The report includes the statement, <i>“Inuit land-users familiar with harvesting at Contwoyto Lake suggested that this southerly movement was atypical, since historically late August has been a good time to harvest caribou at that lake.”</i> This Traditional Knowledge



	suggests that caribou range shifted, at least temporally. According to the Back River Project Wildlife Mitigation and Monitoring Program Plan (Version 10), <i>“Ongoing monitoring for caribou will include re-analyzing collar data each year to investigate if a shift in seasonal distribution is occurring”</i> (page 7-12). As there have now been several years of on-site monitoring, analysis of the collar data could reveal critical information about temporal changes in distribution and space use of caribou herds in proximity to the Back River Project.
Recommendation/Request	Please report the results of re-analysis of collar data with a discussion of any potential temporal or spatial range shifts.
Importance of Issue	Moderate

1.9 KIA-NIRB-09

Review Comment Number	KIA-NIRB-09
Subject/Topic	Marine mammal monitoring during Project shipping
References	<p>Sabina, Back River Project 2021 Annual Report (March 31, 2022)</p> <ul style="list-style-type: none"> • Appendix F. 2021 Pre-Construction Wildlife Mitigation and Monitoring Program Report (March 2022) <ul style="list-style-type: none"> o Appendix 7A. Marine Shipping SOP – Wildlife Mitigation and Monitoring: ENVIRO-02 (Version E.1, 18 March 2022) • Project Certificate Condition No. 64 <p>Sabina, Back River Project, Responses to 2020 Annual Report Comments (July 6, 2021)</p> <ul style="list-style-type: none"> • Response to Kitikmeot Inuit Association, KIA-24 • Response to Kitikmeot Inuit Association, KIA-22 <p>Sabina, Back River Project, Wildlife Mitigation and Monitoring Program Plan (Version 10), October 2019</p>
Summary	Project Condition 64 of the Project Certificate 007 states, <i>“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 monitoring with established data collection and recording protocols.”</i> However, some shipping trips did not include monitoring.
Detailed Review Comment	Appendix F (2021 Pre- Construction Wildlife Mitigation and



	<p>Monitoring Program Report) to the Back River Project 2021 Annual Report reports details on the marine mammal surveys conducted during the 2021 shipping seasons (Section 7, pages 7-1 to 7-11). This report outlines that mammals and seabirds were recorded by crew members on vessels travelling on the eastern shipping route, but that, <i>“(t)hree additional sailings occurred in September 2021 along the western shipping route travelling from Hay River through Tuktoyaktuk and to the MLA; no surveys were conducted during these three sailings in 2021”</i> (page 7-1).</p> <p>The KIA notes that Section 13.2.2.3 and 14.2.2 of the 2019 WMMPP states that marine bird and marine mammal monitoring <i>“will be conducted by all Project ships in each Project stage when shipping is occurring, including Construction, Operations, Care and Maintenance, and Reclamation/Closure.”</i> While the Pre-Construction phase is not listed (or defined), it is still Project-related shipping and thus marine wildlife monitoring needs to be conducted as planned and as part of Sabina’s commitments for PC Conditions No. 58 and 64.</p> <p>Sabina indicated in their response to a previous technical comment that, in lieu of hiring a dedicated marine monitor, they committed to using the vessels’ bridge crew to conduct wildlife monitoring, and that the size of tugs used for transit precluded inclusion of additional personnel to be housed and work on the vessel (Back River Project Responses to 2020 Annual Report Comments, page 27).</p> <p>The SOP states that dedicated marine mammal and seabird surveys should occur, <i>“for a dedicated 30-minute survey period, two to four times per day...”</i> As stated in 2019 and reiterated in 2020, there may be a need for a contingency plan if it is not feasible for regular bridge staff to perform wildlife monitoring for the required amount of time. Consideration also needs to occur regarding how absence of surveys will be accounted for analytically, and if it will affect data analysis.</p> <p>In addition, we note that within the Marine Shipping SOP, Figure 2.1-1: Sensitive Habitat and Setbacks for Seabirds and Seaducks along the Shipping Route (page 5) and Figure 2.1-2: Sensitive Habitat for Marine Mammals along the Shipping Route (page 6) depict primarily the eastern shipping route, and the majority of the western shipping route as depicted in the 2021 Pre-Construction Wildlife Mitigation and Monitoring Program Report (Figure 7.1-1: The Kelly Ovayuak and Henry Christoffersen Vessel Shipping Route between Hay River and the Marine Laydown Area, September 2021, page</p>
--	---



	7-3) is not included in the SOP. Is it possible that the SOP was not properly emphasized for vessels on the western shipping route, or gives the impression that only the areas within the map boundaries should be surveyed? The KIA recognizes the jurisdictional limitations of the NIRB to Nunavut that may have fed into the mapping decisions. However, adding sites within the NWT would likely provide clarity and awareness for captains. Sabina previously provided a comment in response to the KIA's 2020 Annual Report review (KIA-22) stating that they would include migratory bird habitat sites in the NWT in the Shipping Management Plan, the Shipping SOP, and Shipping Management Guidelines to ensure that captains are aware of these areas. Therefore, the KIA expected to see these areas on maps in the 2021 Annual Report.
Recommendation/Request	The KIA requests the following: <ul style="list-style-type: none"> • Please address how the lack of marine mammal and seabird surveys will affect the marine mammal monitoring program and subsequent data analysis. • Please address a contingency plan if it is not feasible to rely on regular bridge staff to have time to perform wildlife monitoring. • Please consider including maps of both the eastern and western route in the Marine Shipping SOP.
Importance of Issue	Moderate

1.10 KIA-NIRB-10

Review Comment Number	KIA-NIRB-10
Subject/Topic	Aircraft incidental sightings reports
References	Sabina, Back River Project 2021 Annual Report (March 31, 2022) <ul style="list-style-type: none"> • Appendix F. 2021 Pre-Construction Wildlife Mitigation and Monitoring Program Report (March 2022) Sabina, Back River Project, Responses to 2020 Annual Report Comments (July 6, 2021) <ul style="list-style-type: none"> • Response to Kitikmeot Inuit Association, KIA-17
Summary	Aircraft pilots were instructed to report all incidental wildlife sightings. However, there were no reported wildlife sightings by fixed wing or helicopter pilots in 2021.
Detailed Review Comment	In 2021, aircraft reported zero wildlife sightings (Appendix F. 2021 Pre-Construction Wildlife Mitigation and Monitoring Program Report, part of the Back River Project 2021 Annual Report, pages 5-2 and 5-3), despite helicopters being active



	<p>at the Goose site from May – October 2021 (Figure 5.1-1: Frequency of Helicopter Flights Below 610 m, May to October, 2021, page 5-4) and fixed-wing aircraft operating at least once a week from Spring-Fall 2021 (page 1-1) (however, as in previous years, the number of helicopter and fixed wing flights could not be determined from the presented information in the annual report). In 2020, aircraft reporting protocols resulted in three observations, an improvement over zero aircraft-based wildlife observations in 2019 (Back River Project Responses to 2020 Annual Report Comments, KIA-17, pages 18-19). There were also wildlife sightings from non-aircraft Project personnel over the same time period in 2021, with nine reported caribou sightings (page 5-14) from May – October 2021 and 11 reported sightings of other terrestrial mammals during September and October 2021 (Appendix 5E: Incidental Terrestrial Mammal Observations, 2021).</p> <p>The pilot reporting program is an important aspect of monitoring, especially in context of any staged mitigation responses for caribou. There is almost certainly still an issue of wildlife underreporting by pilots that should be improved.</p>
<p>Recommendation/Request</p>	<p>To reiterate recommendations made in response to the 2020 Annual Report, the KIA recommends:</p> <ul style="list-style-type: none"> • Ensure that pilot wildlife reporting training is thorough and emphasized regularly, such as during daily safety meetings. • Emphasize the value of wildlife reporting to both safety and the project’s compliance to monitor wildlife in the project area as an important trigger for mitigation and work stoppages. • Work to identify any obstacles to pilot reporting and ways to remove reporting barriers • Consider testing reporting compliance by cross-referencing flight paths with caribou collar data or incidental report(s) of large numbers of animals.
<p>Importance of Issue</p>	<p>Moderate - High</p>

1.11 KIA-NIRB-11

<p>Review Comment Number</p>	<p>KIA-NIRB-11</p>
<p>Subject/Topic</p>	<p>Ecosystem/vegetation losses in 2021 and lack of trend analyses.</p>
<p>References</p>	<p>Sabina, Back River Project 2021 Annual Report (March 31, 2022)</p> <ul style="list-style-type: none"> • Project Certificate Condition No. 32



	<ul style="list-style-type: none"> o Table 4.5.9-1, Figure 4.5.9-1 • Appendix D. Vegetation Monitoring Program – Technical Memorandum (March 31, 2022) <ul style="list-style-type: none"> o Section 4.1, Section 3.0, Section 2.0 <p>Sabina, Back River Vegetation Monitoring Plan (January 2020)</p> <ul style="list-style-type: none"> • Section 5.2.3; Table 5-1 <p>Sabina, Back River Project, Wildlife Mitigation and Monitoring Program Plan (Version 10), October 2019</p> <ul style="list-style-type: none"> • Section 3.2.1 <p>Sabina, Back River Project, Responses to 2020 Annual Report Comments (July 6, 2021)</p> <ul style="list-style-type: none"> • Response to Kitikmeot Inuit Association, KIA-27
<p>Summary</p>	<p>Habitat loss due to expansion of the Project footprint in 2021 has not been compared to 2020 data. One of the dominant vegetation associations (undifferentiated tundra) is missing from the summary table showing cumulative habitat loss in 2021. Sabina still considers analysis of trends “<i>not applicable</i>” despite multiple years of vegetation monitoring data available.</p>
<p>Detailed Review Comment</p>	<p>PC Condition No. 32 requires annual reporting of the current Project footprint, including the loss or alteration of vegetation associated with Project activities. Table 4.5.9-1 and Figure 4.5.9-1 show the cumulative habitat loss at the Goose Property and MLA Property as of 2021. It would be informative to also show, numerically and graphically/spatially, the difference in habitat loss between 2020 and 2021, such that specific areas of new disturbance can be identified. Based on the 2020 Vegetation Monitoring Plan (VMP), Table 5-1, one of the objectives of footprint monitoring is to show a “<i>spatial comparison of the previous footprint to the current year’s footprint.</i>” It is also unclear why footprint monitoring results are directly discussed under PC Condition No. 32 rather than as part of the Vegetation Monitoring Program report (Appendix D of the 2021 Annual Report), which excluded footprint monitoring as an activity conducted in 2021 (Section 3.0).</p> <p>In addition, the KIA notes that ‘Undifferentiated Tundra’ (TEM code TU) is not included in Table 4.5.9-1, despite being one of the dominant vegetation associations in the LSA, and within which vegetation monitoring plots have been established (Section 4.1, Vegetation Monitoring Program Report, Appendix D of the 2021 Annual Report). It is unclear whether the ecosystem classification changed in 2021.</p> <p>There are additional discrepancies between Table 4.5.9-1</p>



	<p>and habitat loss information within the Vegetation Monitoring Program and WMMP reports.</p> <ul style="list-style-type: none"> • Please complete a trend analysis for vegetation monitoring data from 2018 to 2021 or provide science- or statistics-based rationale for when trend analyses will be possible.
Importance of Issue	Moderate

1.12 KIA-NIRB-12

Review Comment Number	KIA-NIRB-12
Subject/Topic	Vegetation Monitoring Plan – triggers for adaptive management
References	<p>Sabina, Back River Project 2021 Annual Report (March 31, 2022)</p> <ul style="list-style-type: none"> • Project Certificate Condition No. 34 • Appendix D. Vegetation Monitoring Program – Technical Memorandum (March 31, 2022) <p>Sabina, Back River Vegetation Monitoring Plan (January 2020)</p> <ul style="list-style-type: none"> • Tables 5.1-1, 5.2-2, 5.3-1, 5.4-1, 5.5-1
Summary	<p>Details on the triggers for implementing adaptive management (e.g., EIS predictions) should be directly included in the VMP and referred to during annual reporting. There is no discussion of how the 2021 vegetation monitoring results should/could inform adaptive management in the Vegetation Monitoring Program report.</p>
Detailed Review Comment	<p>The Terms or Conditions (TCs) of PC Condition No. 34 include:</p> <p>c. Details on the triggers for implementing adaptive management options if effects to vegetation are observed, including potential impacts from dust deposition; and,</p> <p>d. Discussion of how the findings from monitoring efforts would be used to inform reclamation planning.</p> <p>However, the 2020 VMP does not outline the quantitative thresholds for triggering adaptive management. Rather, the “Criteria” for each vegetation monitoring component (Footprint, Vegetation, Non-native Plant, Lichen, Winter Ice Road [WIR]) refer to exceeding the predictions of the EIS. It would be much easier to track performance and effectiveness of mitigation measures if the EIS predictions and trigger thresholds were provided in the VMP and reiterated during annual reporting of the monitoring results. The 2021 Vegetation Monitoring Program report (Appendix D of the</p>



	<p>2021 Annual Report) does not refer to the EIS predictions at all.</p> <p>Furthermore, despite Sabina’s assertion in the ‘Next Steps’ section under PC Condition No. 34, the Vegetation Monitoring Program report does not provide a discussion about how the 2021 monitoring results will inform adaptive management strategies and reclamation planning, despite some results of lichen monitoring showing “undesirable change” since baseline (see review comment KIA-NIRB-18). Sabina needs to provide a more fulsome discussion of the vegetation monitoring results and potential mitigation and management options.</p>
Recommendation/Request	<p>The KIA recommends/requests the following:</p> <ul style="list-style-type: none"> • Please include the monitoring trigger thresholds (e.g., EIS predictions) in the VMP and other VEC monitoring plans, as applicable, such that exceedances can be readily identified. • Please provide a more fulsome discussion of the 2021 vegetation monitoring results and how the results will inform adaptive management strategies (see also KIA-NIRB-19).
Importance of Issue	Moderate

1.13 KIA-NIRB-13

Review Comment Number	KIA-NIRB-13
Subject/Topic	Progressive revegetation program and studies
References	<p>Sabina, Back River Project 2021 Annual Report (March 31, 2022)</p> <ul style="list-style-type: none"> • Project Certificate Condition No. 35, No. 36 <p>Sabina, Back River Project, Interim Closure and Reclamation Plan (July 2021)</p> <ul style="list-style-type: none"> • Section 6.3, Appendix E
Summary	The Back River progressive vegetation program has not been fully developed since research studies are continuing to be conducted. The Revegetation Studies review is missing from Appendix E of the ICRP.
Detailed Review Comment	Sabina refers to the progressive vegetation program described in their 2021 Interim Closure and Reclamation Plan (ICRP) to demonstrate compliance with PC Conditions No. 35 and No. 36. Section 6.3 of the ICRP consists of three paragraphs about Progressive Revegetation Studies and is not a “program” that would typically include detailed objectives, methods, monitoring, mitigation and adaptive



	<p>management, etc.</p> <p>Section 6.3 of the ICRP also refers to a revegetation research program that has been initiated, with the results of a review of revegetation programs and studies completed at other northern mine sites presented in Appendix E. However, Appendix E of the ICRP, entitled “Reclamation Studies”, has no content. Sabina summarizes the results of this review in Section 6.3, concludes that active revegetation has limited benefits, and discusses further work/research that may be conducted in the future. As the progressive revegetation program has not yet been fully developed and finalized, the KIA considers Sabina Partially Compliant with PC Condition No. 35. If the Appendix E, Reclamation Studies, are provided for review, the KIA agrees that Sabina would be Compliant with PC Condition No. 36; it is acknowledged that the ICRP will be updated with new research findings on an ongoing basis.</p>
Recommendation/Request	<p>The KIA recommends/requests the following:</p> <ul style="list-style-type: none"> • Please provide the Reclamation Studies conducted by Sabina in 2021 (Appendix E of the ICRP) for review. • Please amend the annual reporting for PC Condition No. 35 to be more transparent that a progressive revegetation program has not been fully developed.
Importance of Issue	Low-Moderate

1.14 KIA-NIRB-14

Review Comment Number	KIA-NIRB-14
Subject/Topic	Pre-Construction vs. Construction activities and monitoring
References	<p>Sabina, Back River Project 2021 Annual Report (March 31, 2022)</p> <ul style="list-style-type: none"> • Project Certificate Conditions No. 34, No. 54, No. 56 • Appendix D. Vegetation Monitoring Program – Technical Memorandum (March 31, 2022) <p>Sabina, Back River Vegetation Monitoring Plan (January 2020)</p> <ul style="list-style-type: none"> • Section 5, Table 5-1 <p>Sabina, Back River Project, Wildlife Mitigation and Monitoring Program Plan (Version 10), October 2019</p> <ul style="list-style-type: none"> • Table 6.2-1 <p>Sabina, Back River Project, Final Environmental Impact Statement, Volume 1: Main Volume</p> <ul style="list-style-type: none"> • Executive Summary, Table 1



	<ul style="list-style-type: none"> • Section 1.4.1 <p>Sabina, Back River Project, Responses to 2018 Annual Report Comments</p> <ul style="list-style-type: none"> • Response to Kitikmeot Inuit Association, KIA-1
<p>Summary</p>	<p>The Proponent still considers the Back River Project to be in the Pre-Construction phase, which was not defined. However, in 2021, Sabina completed drilling and blasting activities, methods that will likely be used during the Construction phase. In addition, Sabina conducted monitoring activities for vegetation and birds that are planned for the Construction phase as per the VMP and WMMPP, respectively. As a result of the Project being categorized as being in Pre-Construction, fewer monitoring and reporting commitments are being upheld.</p>
<p>Detailed Review Comment</p>	<p>Sabina considers the Back River Project to still be in the Pre-Construction phase (and thus fewer monitoring and reporting requirements from the Project Certificate No. 007 apply). It remained unclear as to what is defined as occurring within the Pre-Construction phase, as this phase was not referred to during project certification. However, there are examples in the 2021 Annual Report where Sabina is already undertaking monitoring that is planned for the Construction phase, including:</p> <ul style="list-style-type: none"> • Vegetation monitoring (2020 VMP, Table 5-1) – the monitoring schedule/sampling frequency for all components of the vegetation monitoring program (footprint, WIR, vegetation, non-native plants, lichen) is either annually or every three years “during Construction and Operation”. • Pre-clearing nest surveys (2019 WMMP, Table 6.2-1) – for all bird VECs (raptors, waterbirds, upland birds, marine birds), pre-clearing surveys for nests would be conducted in the spring if triggered during the “Mobilization and Construction” phase, and not the “Baseline/Pre-Construction” phase. Although no ground clearing was required during the bird breeding season in 2021, and therefore no pre-clearing surveys were required (2021 Annual Report for PC Conditions No. 54 and No. 56), pre-clearing nest surveys were conducted in 2020. <p>In Section 1.2 of the 2021 Pre-Construction WMMP Report, Sabina explains that the 2021 Goose Site Earthworks included drilling and blasting at the portal box cut and development of the bulk-sample underground workings; and drilling, blasting and pad construction at the new permanent fuel tank pad. It is unclear how drilling and blasting activities can still be considered Pre-Construction rather than</p>



	<p>Construction.</p> <p>During review of the Back River 2018 Annual Report, the KIA previously submitted a technical comment critiquing Sabina’s argument that the Project is still in the Pre-Construction phase (KIA-1). Comment KIA-1 was focused on sensitive landform mitigation and monitoring, and the issues still apply for this 2021 Annual Report (see review comment KIA-NIRB-02). Sabina’s response to the 2018 Annual Report comment KIA-1 defined the contentious Project phases as:</p> <ul style="list-style-type: none"> • Construction – full mobilization of all materials and personnel on site wherein the site is occupied year-round to initiate construction of all core mine infrastructure. • Mobilization – the time period where some mobilization and development works [i.e., Pre-Construction including site preparation and staging of materials and equipment in advance of construction (NIRB Decision S. 3.4)] can be undertaken consistent with the appropriate permits/licenses on a seasonal basis. <p>Regardless of the semantics and technicalities of these definitions (e.g., year-round vs. seasonal occupation) for identifying the Project phase, the construction activities that occurred in 2021 could impact terrestrial environment VECs in the same way. In addition, by claiming that the Project is still within the Pre-Construction phase, despite undertaking activities that are similar to those that will be used during Construction (e.g., drilling and blasting), Sabina does not appear to be following the precautionary principle that they claim to subscribe to in Section 1.4.1 of Vol. 1 of the FEIS.</p>
<p>Recommendation/Request</p>	<p>The KIA recommends/requests the following:</p> <ul style="list-style-type: none"> • Please provide a definition of “Pre-Construction”, how the activities conducted at the site during “Pre-Construction” differ from activities to be conducted during “Mobilization” and “Construction,” and a timeline for when the “Mobilization and Construction” phase will begin. In the previous response supplied, the term Pre-Construction was used to provide an example of something that could occur during Mobilization, but still no clear definition was provided for where Pre-Construction activities end, and Construction activities begin. • A clear list of activities that would be considered to fall within Pre-Construction, the extent of those activities, and how NIRB Project Certificate conditions do or do not apply to each (e.g., in a table format) would help provide clarity for all parties involved and would provide a clear means by which to compare Project activities to compliance requirements of the Project Certificate.



Importance of Issue	Low
----------------------------	-----

1.15 KIA-NIRB-15

Review Comment Number	KIA-NIRB-15
Subject/Topic	Vegetation monitoring – missing results from planned methods
References	<p>Sabina, Back River Project 2021 Annual Report (March 31, 2022)</p> <ul style="list-style-type: none"> • Project Certificate Condition No. 34 • Appendix D. Vegetation Monitoring Program – Technical Memorandum (March 31, 2022) <ul style="list-style-type: none"> o Section 4.1, Section 5.1, Appendix D, Appendix C <p>Sabina, Back River Vegetation Monitoring Plan (January 2020)</p> <ul style="list-style-type: none"> • Section 5, Table 5-1 <p>Sabina, Back River Project, Responses to 2019 Annual Report Comments (June 29, 2020)</p> <ul style="list-style-type: none"> • Response to Kitikmeot Inuit Association, KIA-27
Summary	The vegetation monitoring program appears to not be collecting or reporting on 70% of the planned monitoring parameters, including relative abundance of vascular and non-vascular species; plant vigour/health; dominant structural stage, moisture regime, and nutrient regime; wildlife sign; and disturbance class.
Detailed Review Comment	<p>Within the Methods proposed for Vegetation Monitoring (Section 4.1 in the 2021 Vegetation Monitoring Program report), information to be collected at each plot includes:</p> <ul style="list-style-type: none"> • Plant species composition (richness) and relative abundance (percent cover) of vascular plant and non-vascular species; • Average heights of plant species observed; • Vigour class or overall plant health of vascular plant species; • Relative abundance (percent cover) of surface substrate materials; • Dominant structural stage, moisture regime, and nutrient regime; • Wildlife sign (e.g., fecal pellets, browsing/grazing, beds, digging) observations, if present; and • Disturbance class (note: this parameter is not listed on p. 7 among the others, but the disturbance class scoring system is provided on p. 8). <p>However, the Results in Section 5.1 only describe three</p>



parameters (highlighted in bold in the list above): average vegetation height, average surface substrate percentage, and average species richness. As such, seven out of 10 (70%) of the proposed vegetation monitoring parameters are not accounted for. With respect to wildlife sign, there are very limited incidental observations in Appendix D of the Vegetation Monitoring Program report; however, these are “site conditions” notes for the lichen monitoring component, and the lichen sampling plots were specifically located adjacent to (rather than within) the vegetation monitoring plots (Section 4.3, p. 9). Furthermore, the results for average surface substrate percentage (Table 5) only shows seven “vegetation associations” and does not include three types listed in Section 4.1, pp. 7-8: fungi, water, and decaying wood. It is unclear whether none of these vegetation associations were found, or if they were not assessed as per the VMP.

In addition, Section 7 (Quality Assurance and Quality Control) of the 2020 VMP states that *“photographs will be utilized to facilitate inter-annual comparisons through the qualitative examination of species vigour/health, species present, ground cover, and observable (anthropogenic) disturbance or general changes in vegetation cover.”* This statement implies that plant vigour, disturbance, and other monitoring parameters should be analyzed by comparing photos between years. There is no discussion of photo comparisons within the 2021 Vegetation Monitoring Program report; Appendix C simply shows representative plot photographs of vegetation types without further analysis.

In summary, although Sabina has developed a Vegetation Monitoring Plan to comply with PC Condition No. 34, they do not appear to be following their VMP as written.

Note that the KIA previously submitted a similar comment during review of the Back River 2019 Annual Report (KIA-27). Sabina’s response about missing vigour class information was that *“vegetation vigour... was only included in the monitoring results as part of the disturbance level.”* This rationale is inadequate for the 2021 Vegetation Monitoring Program report as there is no discussion of disturbance class either. In addition, Sabina’s response to KIA-27 explained that moisture and nutrient regime information were collected but not discussed because *“there were no apparent changes resulting from use of the WIR”*. Similarly, decayed wood (as a surface substrate material) was not included in the summary tables as no observations were made of decayed wood while collecting plot data. As the “missing” data appear to be a recurring issue, it would be more



	transparent if Sabina presented all monitoring results (including not-detected and no-change data) in the annual report to demonstrate that the VMP was followed.
Recommendation/Request	<p>The KIA recommends/requests the following:</p> <ul style="list-style-type: none"> • Please explain why the majority of the proposed vegetation monitoring parameters are not discussed in the results section of the 2021 Vegetation Monitoring Program report. • Please clarify whether data have been collected for the missing parameters since the vegetation monitoring program began in 2018. If the data were collected but not reported in annual reports because Sabina deemed that no apparent changes have occurred, please present the 3-year monitoring results (2018-2021) to support this claim for monitoring/reporting transparency. • Please include not-detected and no-change monitoring results in future Vegetation Monitoring Program reports to allow for greater transparency in Sabina's methods and analyses; this is a request that has been repeated among reviews by the KIA to date and is still not being done. • Please explain how Sabina considers themselves compliant with Project Certificate Condition No. 34 if the vegetation monitoring program is not following the approved VMP (e.g., lack of inter-annual comparisons via photo analysis).
Importance of Issue	Moderate

1.16 KIA-NIRB-16

Review Comment Number	KIA-NIRB-16
Subject/Topic	Vegetation species of conservation concern
References	<p>Sabina, Back River Project 2021 Annual Report (March 31, 2022)</p> <ul style="list-style-type: none"> • Project Certificate Condition No. 55 • Appendix D. Vegetation Monitoring Program – Technical Memorandum (March 31, 2022) <ul style="list-style-type: none"> o Section 5.1, Appendix B • Appendix F. 2021 Pre-Construction Wildlife Mitigation and Monitoring Program Report (March 2022) <ul style="list-style-type: none"> o Section 5.7.2, Section 8 <p>Sabina, Back River Vegetation Monitoring Plan (January 2020)</p> <ul style="list-style-type: none"> • Section 5.2.2 <p>Sabina, Back River Project, Wildlife Mitigation and Monitoring Program Plan (Version 10), October 2019</p>



<p>Summary</p>	<p>Vegetation monitoring currently only considers species listed on Schedule 1 of the federal SARA, whereas wildlife species of conservation concern include species at risk under SARA or as designated by COSEWIC, and species listed in Nunavut by the CESSC. The KIA recommends that a broader definition of vegetation species of concern be used, and that rare plant surveys be conducted prior to clearing activities.</p>
<p>Detailed Review Comment</p>	<p>Section 5.2.2 of the 2020 VMP (sampling methods for vegetation monitoring) defines rare plants as “vascular and non-vascular species listed under SARA Schedule 1 and species with “Endangered”, “Threatened”, or “Special Concern” status.” It is unclear whether this is a Project- or Proponent-specific definition – and approved by stakeholders – since listings under SARA Schedule 1 are typically considered “species at risk”, whereas “rare species” are often defined based on national (N) or subnational (S) conservation rankings between Vulnerable (N/S3) and Critically Imperiled (N/S1). Based on the Canadian Endangered Species Conservation Council (CESSC)’s Wild Species 2015: The General Status of Species in Canada data, some of the vegetation species observed in 2021 (Appendix B of the 2021 Vegetation Monitoring Program report) constitute species of conservation concern, including:</p> <ul style="list-style-type: none"> • Critically Imperiled/Imperiled (S1S2) – Schreber’s moss, Pleurozium schreberi • Vulnerable (S3) – beautiful sedge, Carex concinna • 3 moss and lichen species considered Vulnerable/Apparently Secure (S3S4) • 16 lichen species considered Vulnerable/Secure (S3S5) <p>The KIA notes that Sabina considers CESSC rankings for wildlife VECs. Section 8 of the 2021 WMMPP Report states that “<i>species of conservation concern include those listed in Nunavut by the CESSC or those listed as Endangered, Threatened, or Special Concern on Schedule 1 of the SARA</i>”, and COSEWIC conservation rankings are also noted for wildlife species at risk. It is unclear why vegetation species of conservation concern are not considered in the same way by Sabina. For example, PC Condition No. 55, related to Species at Risk, is not included within the Vegetation Section 4.5.9 of the 2021 Annual Report. Although the KIA understands that PC Condition No. 55 originally pertained to birds and bird habitat, Sabina has already expanded the scope of this condition to other terrestrial and marine wildlife. As the definition of “wildlife species” under the federal SARA includes an animal, plant or other organism, other than a bacterium or virus, that is wild by nature and is native or</p>



	<p>naturalized to Canada, the KIA feels that it is reasonable to include all vegetation species of conservation concern as part of the Project monitoring programs.</p> <p>If Sabina is amenable to the KIA’s request, it would also be useful to present observations of vegetation species of conservation concern spatially in future annual reports. Currently, it is unknown to the reader within which plots the CESSC-listed plants were found. Furthermore, it is unclear whether rare plant surveys are conducted prior to Project clearing activities. Since CESSC-listed plants have been found within monitoring plots, it is reasonable to assume that rare plants may occur elsewhere within the Project Development Area (PDA). To avoid project-related impacts to vegetation species of conservation concern, rare plant surveys should be conducted prior to clearing and mitigation applied as needed (e.g., avoidance if possible, or salvage performed by a Qualified Professional).</p>
Recommendation/Request	<p>The KIA recommends/requests the following:</p> <ul style="list-style-type: none"> • Please expand the definition of “rare plants” to include those listed in Nunavut by the CESSC, similar to how wildlife species of conservation concern are defined in the WMMPP. • Please show the spatial locations of vegetation species of conservation concern (including CESSC-listed species) in future annual reports. • Please clarify whether rare plant surveys are conducted prior to Project clearing activities. If not, please include rare plant surveys and salvage (if needed) in the VMP to avoid impacting vegetation species of conservation concern.
Importance of Issue	High

1.17 KIA-NIRB-17

Review Comment Number	KIA-NIRB-17
Subject/Topic	Non-native plant species in the Tundra
References	<p>Sabina, Back River Project 2021 Annual Report (March 31, 2022)</p> <ul style="list-style-type: none"> • Project Certificate Condition No. 55 • Appendix D. Vegetation Monitoring Program – Technical Memorandum (March 31, 2022) <ul style="list-style-type: none"> o Section 5.2
Summary	Information about vegetation species that are considered native in the territory as a whole, but may be considered locally or regionally non-native, should be included in the



	VMP and annual report for non-native plant monitoring.
Detailed Review Comment	In Section 5.2 of the 2021 Vegetation Monitoring Program report, Sabina states that “ <i>Common fireweed (Chamerion angustifolium)</i> although not an invasive weed, can be considered non-native in the Tundra...” There is no source reference for this information. According to the CESC’s Wild Species 2015 data, common fireweed is considered Native but Unrankable (SU) in Nunavut. If Sabina has gathered TK or local knowledge about common fireweed and other species that could be considered regionally or locally non-native, it would be useful to include this information in the VMP and annual report.
Recommendation/Request	The KIA recommends/requests the following: <ul style="list-style-type: none"> • Please provide the source(s) of information for why common fireweed may be considered non-native in the Tundra. • If additional local/regional information is available for non-native species, please include another list of species within the VMP and annual vegetation monitoring report.
Importance of Issue	Low

1.18 KIA-NIRB-18

Review Comment Number	KIA-NIRB-18
Subject/Topic	Lichen monitoring data collection, analysis and discussion
References	<p>Sabina, Back River Project 2021 Annual Report (March 31, 2022)</p> <ul style="list-style-type: none"> • Project Certificate Condition No. 34 • Appendix D. Vegetation Monitoring Program – Technical Memorandum (March 31, 2022) <ul style="list-style-type: none"> o Appendix D, Appendix E; Section 4.3.2; Section 5.3 <p>Sabina, Back River Vegetation Monitoring Plan (January 2020)</p> <ul style="list-style-type: none"> • Table 5.4-1
Summary	The results of lichen monitoring are briefly outlined in Section 5.3 of the 2021 Vegetation Monitoring Program report. There are cross-references to three appendices of the report showing field and laboratory data, but limited discussion about the results themselves. There are some monitoring results that may be concerning; therefore, Sabina needs to provide a more detailed analysis and discussion in comparison to the predictions of the EIS.



Detailed Review Comment	
	<p>Appendix E shows the Lichen Chemistry Graphs for parameters considered toxic to caribou, compared to baseline results. From a visual review of the figures, 9/19 elements analyzed were found to have potentially significantly higher levels at 0 m from the Goose Property in 2021 than the baseline data, including arsenic, barium, cadmium, chromium, lead, molybdenum, strontium, vanadium, and zinc. At the MLA site, 5/19 elements analyzed were found to have potentially significantly higher levels at 0 m from the Project in 2021 compared to baseline, including cadmium, manganese, mercury, uranium, and zinc. (Note: boron was also detected at both sites but there are no baseline data for comparison.) It is unknown whether the 2021 levels are statistically significantly higher than baseline, as there are no statistics presented. It is also unclear whether the 2021 levels are biologically significant (e.g., acutely or chronically harmful to caribou if they forage on the lichen) because Sabina does not provide further analysis or discussion. Table 5.4-1 in the VMP provides an overview for the lichen monitoring program, including:</p> <ul style="list-style-type: none"> • Goal – The Mine will not result in a significant increase in contaminant uptake in vegetation. • Criteria – Increase in metal concentration in lichen within the LSA and concentrations beyond the predictions of the EIS. <p>As discussed in review comment KIA-TC-12, the EIS predictions are not included in either the VMP or the 2021 Vegetation Monitoring Program report. Without more detailed reporting, it is unclear whether the lichen sampling results in 2021 constituted “a significant increase in contaminant uptake” and a need for mitigation measures to be undertaken. The omission of a more fulsome discussion of the monitoring results may imply that Sabina is not in full compliance with PC Condition No. 34 (regarding the VMP). As part of the data analyses (Section 4.3.2), Sabina calculated the relative percent difference (RPD) for each analyzed parameter for duplicate lichen samples to assess homogeneity. A lower RPD indicates higher sample homogeneity, while a RPD of 30% or greater was “considered notable”. The results in Section 5.3 show that the incidence of RPDs greater than 30% was generally high in the lichen duplicates. However, Sabina does not provide an explanation for the implications of these results. Why would duplicate lichen samples be so heterogeneous? What does this mean with respect to evaluating monitoring results and comparing with EIS predictions? Are there field collection and/or lab analysis issues?</p>



	<p>Furthermore, Sabina states in Section 5.3 that weather conditions at time of sampling and surface substrate percentages were recorded, shown in Appendix D. However, while Table 9 (Lichen Sampling Plot Information) in Appendix D has a column for weather and site conditions, the information was incompletely and non-systematically recorded – there is some weather information (e.g., rain, wind, qualitative temperature, dryness), some incidental observations and comments, and some location notes, while other plots are missing information entirely. It would be better if Sabina provides their field staff with more detailed instructions about the data to record at each lichen monitoring plot.</p>
Recommendation/Request	<p>The KIA recommends/requests the following:</p> <ul style="list-style-type: none"> • Please provide a statistical analysis of the 2021 lichen sampling results and a discussion of the biological implications for caribou that may ingest lichen containing these levels of metals. • Please provide a comparison of the 2021 lichen sampling results with the predictions of the EIS and provide rationale for whether mitigation measures are needed. • Please explain the implications of the RPDs found for duplicate lichen samples in 2021 with respect to interpretation of monitoring results. Please also indicate if corrective actions need to be taken for field and/or lab work. • Please provide more specific instructions to field staff such that environmental data are collected systematically and allow for future analyses.
Importance of Issue	High

1.19 KIA-NIRB-19

Review Comment Number	KIA-NIRB-19
Subject/Topic	Area of suitable habitat lost for wildlife VECs
References	<p>Sabina, Back River Project 2021 Annual Report (March 31, 2022)</p> <ul style="list-style-type: none"> • Project Certificate Condition No. 37 • Appendix F. 2021 Pre-Construction Wildlife Mitigation and Monitoring Program Report (March 2022) <ul style="list-style-type: none"> o Table 3.2-3; Table 3.2-2, Section 3.2.1, Section 3.1.2 <p>Sabina, Back River Project, Wildlife Mitigation and Monitoring Program Plan (Version 10), October 2019</p> <ul style="list-style-type: none"> • Definitions of Project Areas (Page xi)



	<ul style="list-style-type: none"> • Section 7.2.2.1 								
Summary	<p>The area of suitable habitat lost for wildlife VECs due to the Project are presented overall rather than by site, which does not allow for direct comparison with the FEIS predictions. In addition, over 200 ha of the PDA appears to be missing for the caribou winter habitat suitability model results.</p>								
Detailed Review Comment	<p>Table 3.2-3 of the 2021 Pre-Construction WMMP Report presents the area of suitable habitat lost for wildlife VECs due to the Project. While Sabina shows the Total FEIS predicted loss in the PDA overall and in the MLA and Goose PDAs separately, the actual habitat losses in 2021, Pre-2021, and Total are only presented overall and not by site. It would be more transparent to separate out habitat loss by site such that the FEIS predictions can be directly compared. For example, it is currently unclear how much of the 15-ha total loss of raptor cliff-nesting habitat has occurred at Goose vs. MLA. The FEIS predicted only 5 ha loss at the MLA; thus, it is important to know whether habitat loss exceedances have occurred at the MLA.</p> <p>Note that Section 7.2.2.1 (Footprint Monitoring) of the 2019 WMMPP states that the trigger for adaptive mitigation is <i>“if the constructed footprint exceeds the planned PDA area”</i>. As the Goose Site PDA and MLA PDA are defined separately in the <i>“Definitions of Project Areas”</i> on Page xi of the 2019 WMMPP, footprint monitoring should also be presented separately for the two sites. Without this analysis, Sabina is not fully compliant with PC Condition No. 37 (regarding the WMMP).</p> <p>With respect to area of suitable winter habitat for caribou, there are some discrepancies between the sum of High, Moderate, Low, and Nil area sizes in Table 3.2-2 and the information presented in Section 3.2.1 of the 2021 Pre-Construction WMMP Report:</p> <table border="1"> <thead> <tr> <th></th> <th>Section 3.2.1</th> <th>Table 3.2-2 (sums)</th> <th>Difference</th> </tr> </thead> <tbody> <tr> <td>Goose PDA</td> <td>5,427 ha</td> <td>5,231 ha</td> <td>196 ha</td> </tr> </tbody> </table>		Section 3.2.1	Table 3.2-2 (sums)	Difference	Goose PDA	5,427 ha	5,231 ha	196 ha
	Section 3.2.1	Table 3.2-2 (sums)	Difference						
Goose PDA	5,427 ha	5,231 ha	196 ha						



	<p>Operations SOP – ENVIRO-03 o Appendix 5C. Wildlife Safety Site Audit Report, August 2021</p> <p>Sabina, Back River Project, Wildlife Mitigation and Monitoring Program Plan (Version 10), October 2019</p> <ul style="list-style-type: none"> • Table 4.1-1, Table 6.2-1 <p>Sabina, Back River Project, Final Environmental Impact Statement Supporting Volume 5: Terrestrial Environment</p> <ul style="list-style-type: none"> • Chapter 9. Migratory Birds (Upland Birds and Waterfowl) • Chapter 10. Raptors <p>Sabina, Back River Project, Final Environmental Impact Statement Supporting Volume 7: Marine Environment</p> <ul style="list-style-type: none"> • Chapter 6. Seabirds / Seaducks
<p>Summary</p>	<p>There were no incidental observations of birds made by pilots or other Project staff in 2021. The KIA suspects that the lack of observations is partly due to unclear instructions on the Incidental Wildlife Observations Datasheet. The KIA also disagrees that raptors and large groups of waterbirds are the only notable birds worth recording.</p>
<p>Detailed Review Comment</p>	<p>Section 6.1 (Aircraft Management) of the 2021 Pre-Construction WMMP Report states that no incidental observations of birds were reported by pilots in 2021. Similarly, Section 6.3 states that there were no incidental observations of birds recorded by Sabina employees while on site, and that few incidental sightings of birds were recorded in previous years. Examples of incidental records in 2020 and 2019 include large flocks (approx. 200) of geese flying overhead; Sabina suggests that these observations may indicate general timing of spring migration for geese around the Goose site, and <i>“illustrates the importance of recording incidental observations of notable bird sightings.”</i></p> <p>The lack of incidental bird observations in 2021 (and sparseness of observations in previous years) is surprising, given that many bird species and individuals were observed during baseline studies (FEIS Supporting Vol. 5, Ch. 9-10; Vol. 7, Ch. 6); marine shipping in 2021 (Appendix 7D of the 2021 Pre-Construction WMMP Report), which included an observation of an eastern phoebe on land near the MLA (Figure 7.1-4); and during the Wildlife Safety Audit in August 2021 (Appendix 5C). Rather, the KIA suspects that unclear or insufficient instructions have been provided to pilots and Project staff.</p> <p>Section 5.1 of the Fixed-Wing and Helicopter Operations SOP indicates that <i>“Pilots will record observations of wildlife during any flights at the Project on the Incidental Wildlife</i></p>



	<p><i>Observations Datasheet (Attachment A), including observations of large mammals, raptors, and waterbirds.”</i> However, the instructions at the top of the Incidental Wildlife Observation Datasheet (vA.1) only require completing the form for the following:</p> <ul style="list-style-type: none">• You observe wildlife (caribou, grizzly bear, wolf, wolverine, muskox, or fox) on the Project Site, including while flying, on-site roads and the winter ice road;• There is a project-related wildlife fatality or injury; or• You observe dead or injured wildlife, even if the fatality was not project related. <p>There are no explicit instructions for recording bird observations. The Species options to circle include the mammals listed above (excluding fox but including “Other (describe)”). Only the notes in Animal Behaviour suggest that birds might be included (e.g., flying, nesting). Furthermore, it is unclear if this Incidental Wildlife Observation Datasheet is meant for pilot use only or if it is for everyone (aside from marine shipping). If this form is general purpose, then the unclear instructions could explain the lack of incidental bird observations made by other Project staff. Additional training and SOP and datasheet amendments are likely needed.</p> <p>The KIA also disagrees with Sabina’s wording in the SOP to record only raptors and waterbirds (among bird VECs) as “notable”. Any incidental sightings of birds should be noted, especially as there are species at risk and those listed as Vulnerable in Nunavut by the CESSC among upland breeding birds (including shorebirds) that could potentially occur in the PDA, including American golden-plover, Harris’s sparrow, hoary redpoll, least sandpiper, red-necked phalarope, and semipalmated sandpiper (Table 4.1-1 in the 2019 WMMPP). Arctic/hoary redpoll and least sandpiper were recorded in the Project area during marine shipping and the wildlife site safety audit in 2021, respectively.</p> <p>Incidental wildlife reporting is one of the monitoring programs for raptors, waterbirds, and upland birds (Table 6.2-1 in the 2019 WMMPP); however, this program may not be being implemented as intended to comply with PC Condition No. 53 (Mitigation, Monitoring, and Adaptive Management for Birds and Bird Habitat). For activities in 2022, the KIA suggests that a qualified person conduct periodic bird surveys while staff are on site could be combined with site monitoring to determine if the presence of species of conservation concern may have been overlooked in previous years.</p>
--	--



Recommendation/Request	<p>The KIA recommends/requests the following:</p> <ul style="list-style-type: none"> • Please amend the Fixed-Wing and Helicopter Operations SOP and the Incidental Wildlife Observations Datasheet to explicitly include all bird VECs, including raptors, waterbirds, and upland breeding birds and shorebirds (individuals and groups). • Please consider assigning a qualified person to conduct periodic bird surveys during Project activities in 2022. This would serve to either 1) confirm that there are few birds at/around the Project sites (consistent with the lack of incidental bird observations in 2021) or 2) provide additional information about bird use of the area that was not previously captured or recorded by Project staff.
Importance of Issue	High

1.21 KIA-NIRB-21

Review Comment Number	KIA-NIRB-21
Subject/Topic	Inconsistent guidelines for aircraft setbacks
References	<p>Sabina, Back River Project 2021 Annual Report (March 31, 2022)</p> <ul style="list-style-type: none"> • Appendix F. 2021 Pre-Construction Wildlife Mitigation and Monitoring Program Report (March 2022) <ul style="list-style-type: none"> o Appendix 5A. Fixed-Wing and Helicopter Operations SOP – ENVIRO-03 <ul style="list-style-type: none"> • Sections 2, 3, 5 o Appendix 5B. Helicopter Operations Guidance and Wildlife Log; Fixed-Wing Operations Guidance and Wildlife Log
Summary	Aircraft setback guidelines are inconsistent within the Fixed-Wing and Helicopter Operations SOP, and between the SOP and the Operations Guidance and Wildlife Log brochures provided to pilots during training.
Detailed Review Comment	Sections 2 and 3 of the Fixed-Wing and Helicopter Operations SOP outlines the setback distances for fixed-wing aircraft and helicopters, respectively. Fixed-wing aircraft are to maintain 610 m above ground level at all times, except when waterbird staging areas are actively used, at which point aircraft are to maintain a horizontal distance of 3,000 m and vertical distance of 650 m. However, Page 3 of the Infographic in Section 5, and Page 3 of the Fixed-Wing Operations Guidance and Wildlife Log, show that fixed-wing aircraft are to maintain 650 m at all times as well. If possible,



	<p>the more conservative altitude shown in the infographic should be adopted, and the text fixed in Section 2.1.</p> <p>Guidelines for helicopters are also inconsistent between Section 3.2 and Pages 1-2 of the Infographic in Section 5 of the SOP, and on Page 4 of the Helicopter Operations Guidance and Wildlife Log. Section 3.2 states that helicopters should maintain a 650 m horizontal distance and 300 m vertical distance from known raptor nest sites when nests may be active. However, the Infographic shows that helicopters should maintain 650 m distance both vertically and horizontally. In addition, the brochure shows inconsistent information on the same page – both 650 m and 610 m horizontal and vertical distances are depicted, and the 610 m distance is presented as horizontal or vertical rather than and. Both the text in Section 3.2 of the SOP and the brochure needs to be updated, preferably to the most conservative setbacks of 650 m horizontal and vertical distances. As Sabina is providing the brochures as part of pilot training, it is important that the information is clear and accurate.</p>
Recommendation/Request	<p>The KIA recommends/requests the following:</p> <ul style="list-style-type: none"> • Please correct the inconsistencies for fixed-wing and helicopter setback guidelines noted for active waterbird staging areas and raptor nests. Please apply the most conservative distances.
Importance of Issue	Moderate

1.22 KIA-NIRB-22

Review Comment Number	KIA-NIRB-22
Subject/Topic	Locations of marine mammal and (sea)bird observations
References	<p>Sabina, Back River Project 2021 Annual Report (March 31, 2022)</p> <ul style="list-style-type: none"> • Appendix F. 2021 Pre-Construction Wildlife Mitigation and Monitoring Program Report (March 2022) <ul style="list-style-type: none"> o Section 7.1.2.2, Section 7.1.2.3 o Appendix 7A. Marine Shipping SOP – Wildlife Mitigation and Monitoring: ENVIRO-02
Summary	There are some discrepancies between the incidental observations of marine mammals and birds noted in Tables 7.1-2 and 7.1-3 versus Figures 7.1-3 and 7.1-4. It is unclear if geographic coordinates were inaccurate or missing.
Detailed Review Comment	Table 7.1-2 and Figure 7.1-3 in the 2021 Pre-Construction WMMP Report present the incidental observations of marine



	<p>mammals recorded during shipping activities in 2021 (for which marine wildlife monitoring was conducted; see the KIA’s critique in review comment KIA-NIRB-09). In Table 7.1-2, Sabina indicates that a bowhead whale was observed swimming 250 m from the vessel. However, the bowhead whale observation on Figure 7.1-3 is located west of Young Island, over 100 km away from the proposed shipping line. It is unclear whether geographic coordinates for the observation were inaccurate, or if the ship needed to divert from the proposed shipping route. Both of these hypotheses require further explanation and/or corrective actions (e.g., GPS equipment malfunction, rationale for route change).</p> <p>Incidental observations of (sea)birds during 2021 shipping are presented in Table 7.1-3 and Figure 7.1-4. However, there appear to be data missing from the map figure as there are no points for peregrine falcon, cackling goose, Lapland longspur, and greater white-fronted goose. Were the geographic coordinates not recorded for these observations?</p> <p>Overall, the KIA appreciates that the marine bird surveyors recorded not only seabirds but other bird species/group as well, including raptors, waterbirds, and upland breeding birds. By doing so, the monitors recorded a species at risk (peregrine falcon), a species considered Vulnerable in Nunavut by the CESSC (Arctic/hoary redpoll), and a species considered ‘accidental’ and unusual in the area (eastern phoebe). Documentation of these ‘notable’ species forms the basis of the KIA’s recommendation for improved incidental bird observation recording by other Project staff in review comment KIA-NIRB-20.</p>
Recommendation/Request	<p>The KIA recommends/requests the following:</p> <ul style="list-style-type: none"> • Please clarify whether the coordinates for the bowhead whale observation are inaccurate (and if corrective actions need to/have been taken) or if the ship went off course from the proposed shipping route (and why). • Please add the missing incidental bird observation data to the map Figure 7.1-4. If location data are not available, please explain why the data are missing, and ensure that locations are collected during future marine seabird monitoring surveys.
Importance of Issue	Low

1.23 KIA-NIRB-23

Review Comment Number	KIA-NIRB-23
------------------------------	-------------



Subject/Topic	Bird species known or potentially occurring along shipping route
References	<p>Sabina, Back River Project 2021 Annual Report (March 31, 2022)</p> <ul style="list-style-type: none"> • Project Certificate Condition No. 54 • Appendix F. 2021 Pre-Construction Wildlife Mitigation and Monitoring Program Report (March 2022) <ul style="list-style-type: none"> o Section 8, Table 8-1 o Appendix 7A. Marine Shipping SOP – Wildlife Mitigation and Monitoring: ENVIRO-02
Summary	<p>There are additional bird species of conservation concern that could be added to Table 8-1 in the 2021 Pre-Construction WMMP Report. Cliff-nesting raptors and species of conservation concern from other bird VECs, aside from seabirds, could also be added to the bird list in the Marine Shipping SOP to assist the marine wildlife monitor.</p>
Detailed Review Comment	<p>Table 8-1 of the 2021 Pre-Construction WMMP Report shows the species of conservation concern known or potentially occurring at the Project, updated for 2021. Two more species could be added to the “<i>Species that Could Be Encountered along the Project Shipping Route</i>” section: purple sandpiper (Vulnerable in Nunavut) and barn swallow (listed as Threatened on Schedule 1 of the SARA, assessed as Special Concern by COSEWIC). There are eBird observations of these two species near Cambridge Bay.</p> <p>In the Marine Shipping SOP, Table 3.2-2 lists the species of seabirds most likely observed along shipping routes in Eastern Canada and the Arctic. The KIA recommends adding a list of species of conservation concern among the other bird VECs to the SOP, such as those listed in Table 8-1 as mentioned above. In addition, it would be useful to include a list of cliff-nesting raptors (e.g., peregrine falcon, golden eagle, gyrfalcon), which may be more visible during shipping than on land. Given that the marine bird surveyors are already recording incidental observations of other bird species (see review comment KIA-NIRB-22), an expanded bird list should not be onerous to the surveyor; rather, it may be more helpful for them to understand additional species of interest with respect to mitigating Project impacts.</p> <p>Finally, there is a terminology error in Section 8, Page 8-1, with respect to changes to federal conservation statuses for species at risk. Sabina states that short-eared owl and Ross’s gull were “down-listed” from Special Concern to Threatened and from Threatened to Endangered, respectively. The opposite term should actually be used – ‘Uplisted’ means</p>



	moving to a higher risk category, while 'Downlisted' means moving to a lower risk category.
Recommendation/Request	<p>The KIA recommends/requests the following:</p> <ul style="list-style-type: none"> • Please add purple sandpiper and barn swallow to the list of species of conservation concern that could be encountered along the project shipping route. • Please consider adding bird species of conservation concern from other bird VECs (i.e., raptors, waterbirds, upland birds) and cliff-nesting raptors to the Marine Shipping SOP. • Please correct the terminology error in Section 8 of the 2021 Pre-Construction WMMP Report for uplisting/downlisting species at risk.
Importance of Issue	Low

1.24 KIA-NIRB-24

Review Comment Number	KIA-NIRB-24
Subject/Topic	Marine Shipping SOP data forms need space for mitigation
References	<p>Sabina, Back River Project 2021 Annual Report (March 31, 2022)</p> <ul style="list-style-type: none"> • Project Certificate Conditions No. 58, No. 64 • Appendix F. 2021 Pre-Construction Wildlife Mitigation and Monitoring Program Report (March 2022) <ul style="list-style-type: none"> o Appendix 7A. Marine Shipping SOP – Wildlife Mitigation and Monitoring: ENVIRO-02 o Appendix 7C. Mammal Observations During Shipping, 2021 o Appendix 7D. Bird Observations During Shipping, 2021
Summary	The marine mammal and seabird survey sightings forms are not set up to encourage users to document management responses, which may result in the reporting sections of the Marine Shipping SOP not being followed correctly.
Detailed Review Comment	<p>The Marine Shipping SOP includes three data forms as attachments: Incidental Marine Wildlife Sightings Form, Marine Mammal Survey Sightings Form, and Seabird Survey Sightings Form. In Section 3.5 of the SOP, Sabina states that management responses will be documented on the appropriate form. In addition, Section 4 outlines the End of Trip Reporting Requirements, including records of mitigation measures taken and ship strikes if they occur.</p> <p>However, the three data forms differ in the fields/spaces</p>



	<p>available for documenting mitigation required and actions taken:</p> <ul style="list-style-type: none"> • Incidental sightings – there is a dedicated section at the bottom of the form for Mitigation Action Taken, including instructions for describing the mitigation action and result. • Marine mammal survey – there is a column in the Sighting Information table for “Mitigation Required?” and then a general Comments/Notes column at the end. • Seabird survey – there is no dedicated space for recording mitigation actions, only a general Comments field at the end of the Sighting Information table. <p>The marine mammal and seabird survey forms should be amended, similar to the fields on the incidental wildlife sightings form, to provide the space needed to document mitigation/management responses when marine wildlife is observed and could potentially be impacted during shipping activities. Without this documentation, Sabina is not fully compliant with PC Conditions No. 58 and No. 64, related to mitigation and monitoring for seabirds and marine mammals, respectively.</p> <p>The lack of dedicated space and unclear instructions may partially explain why the “Mitigation Action (Y/N)?” column could not be filled out for the summary tables of marine mammal and bird observations in 2021 (Appendices 7C and 7D, respectively, of the 2021 Pre-Construction WMMP Report). In addition, the summary tables should not simply be a Yes/No question, as the specific mitigation actions should have been described. The single “Y” entry in these tables, for a killer whale observation, is missing these details. Finally, there is a field for Photo Number on the marine mammal survey form that could be added to the other two data forms. In general, without dedicated data fields, users may forget to collect or record the necessary information for effective monitoring.</p>
<p>Recommendation/Request</p>	<p>The KIA recommends/requests the following:</p> <ul style="list-style-type: none"> • Please amend the Marine Mammal Survey Sightings Form and Seabird Survey Sightings Form to include dedicated spaces to record management responses and mitigation measures. • Please provide additional training for the shipping crew and marine wildlife monitors to clarify that any mitigation measures taken need to be described on the forms.
<p>Importance of Issue</p>	<p>Moderate</p>



1.25 KIA-NIRB-25

Review Comment Number	KIA-NIRB-25
Subject/Topic	Marine Shipping SOP vs. Shipping Management Guidelines brochure
References	<p>Sabina, Back River Project 2021 Annual Report (March 31, 2022)</p> <ul style="list-style-type: none"> • Project Certificate Conditions No. 58, No. 64 • Appendix F. 2021 Pre-Construction Wildlife Mitigation and Monitoring Program Report (March 2022) <ul style="list-style-type: none"> o Appendix 7A. Marine Shipping SOP – Wildlife Mitigation and Monitoring: ENVIRO-02 o Appendix 7B. Shipping Management Guidelines
Summary	There are some discrepancies or unclear information between details in the Marine Shipping SOP and the Shipping Management Guidelines brochure, including seabird colony setback requirements, marine wildlife survey effort, and seabird ship strike reporting requirements.
Detailed Review Comment	<p>Sabina has produced a Shipping Management Guidelines brochure as part of Project training for shipping companies. There are some details in the brochure that are less clear than the information provided in the Marine Shipping SOP:</p> <p>Sensitive Habitat for Seabirds (p. 4) – Compared to Table 3.5-1 in the SOP, the setbacks shown in the brochure are ambiguous. Table 3.5-1 specifies that the setbacks are for any large group (10+) of seabirds on ocean surface OR any colony of seabirds on land while traversing the sensitive habitat areas identified in Figure 2.1-1. The brochure does not mention seabird colonies explicitly. Furthermore, the KIA recommends that any seabird aggregations (10+ individuals) observed whether within the “highly risk intolerant” sites indicated (i.e., Bathurst Inlet/Elu Inlet, Lambert Channel, Eastern Lancaster Sound, Eastern Jones Sound) or the “moderately risk intolerant” sites, or even outside these mapped areas, should also have the 500 m setback applied.</p> <p>Marine Mammal and Seabird Survey Effort (p. 5) – The brochure states that at least 1 dedicated marine mammal survey should be conducted per day, lasting 1.5 to 2 hours; and that 1-3 dedicated seabird surveys should be conducted per day, lasting 30 min each. These instructions are inconsistent with Section 3.4.2 of the SOP, which specifies a dedicated 30 min survey period, 2-4 times per day, for both marine mammals and seabirds. Although the overall timing is generally in agreement, the instructions should be presented in a consistent manner between documents.</p>



	<p>Wildlife Collision Reporting (p. 7) – Section 3.6 of the SOP states that for all ship strikes, an Incidental Marine Wildlife Sightings Form must be filled out. If the ship strike is a marine mammal, the ship’s captain must report the strike to Sabina as soon as practical and within 24 hours and must also report the strike to the DFO. There are no additional reporting requirements for seabird strikes in the SOP, although it is implied that Sabina would be informed of seabird strikes when they receive the completed forms within 2-3 weeks of completion of voyage. (Note: the timeline for submitting forms and ship tracks is noted on p. 6 of the brochure; these details are also not included in the SOP.) However, the brochure has more stringent reporting requirements for seabirds – all collisions must be reported to Sabina, and seabird collisions also need to be reported to CWS and ECCC Wildlife Enforcement. These reporting guidelines should be added to the Marine Shipping SOP.</p>
Recommendation/Request	<p>The KIA recommends/requests the following:</p> <ul style="list-style-type: none"> • Please clarify the instructions for setback distances for seabird colonies in the Shipping Management Guidelines brochure. Please also consider not limiting the setback requirements to the “highly risk intolerant” sites for seabird colonies. • Please resolve the discrepancies for marine mammal and seabird survey effort between the Marine Shipping SOP and the brochure. • Please include the additional seabird collision reporting to CWS and ECCC Wildlife Enforcement in the Marine Shipping SOP.
Importance of Issue	Low

1.26 KIA-NIRB-26

Review Comment Number	KIA-NIRB-26
Subject/Topic	Wildlife protection measures in OPPP & OPEP
References	<p>Sabina, Back River Project 2021 Annual Report (March 31, 2022)</p> <ul style="list-style-type: none"> • Project Certificate Conditions No. 89 • Appendix G. Marine Laydown Area Oil Handling Facility: Oil Pollution Prevention Plan & Oil Pollution Emergency Plan (September 2021) <ul style="list-style-type: none"> o Sections 7.3, 7.4, 7.5, 8.4, 9.1, 10.1; Annex 4
Summary	Further details and clarification are needed regarding the wildlife protection measures outlined in Sabina’s OPPP &



	<p>OPEP to allow for confidence in their implementation and success. The roles and responsibilities, including requirements to be on-site, are unclear for the Technical Specialists and Emergency Contacts in case of spills affecting wildlife. Specific wildlife hazing techniques and equipment are not fully listed in the OPPP & OPEP, which raises the question of how staff can be appropriately trained, and how prepared Sabina is for implementing wildlife protection measures if/when a spill occurs.</p>
<p>Detailed Review Comment</p>	<p>Sabina’s Oil Pollution Prevention Plan & Oil Pollution Emergency Plan (OPPP & OPEP) does not have sufficient details regarding mitigation measures and emergency management response for wildlife protection. As such, it is difficult to determine whether Sabina’s plans will ensure compliance with PC Condition No. 89 (related to protection of marine wildlife, migratory birds, and the marine environment during spills). The KIA requests clarification on the following:</p> <p>Roles and Responsibilities</p> <p>Section 7.5 outlines the “<i>selected Sabina Incident Command System (ICS) positions to be initially staffed, if applicable.</i>” Section 7.5.10 is about the Environmental Unit Lead but refers to Technical Specialists who would perform many of the functions needed (e.g., strategic assessment, modeling, surveillance, environmental monitoring and permitting). There is also a list of “possible assignments” in the ICS Organizational Structure shown in Figure 7.3-1, including Scientific Support Coordinator, Sampling Specialist, Response Technologies Specialist, Trajectory Analysis Specialist, Resources at Risk Specialist, Shoreline Cleanup Assessment Specialist, Historical/Cultural Resources Specialist, and Disposal Specialist. It is unclear whether Sabina has proposed persons in mind for these positions, and whether Sabina has retained these Technical Specialists on site or on call.</p> <p>Sabina also provides a list of “<i>Emergency Contacts in Case of Spills Affecting Wildlife</i>” in Table 8-1. Would any of these contacts take on one or some of Technical Specialist roles? Regardless, only the Nunavut Emergency Management contact is based in the territory (but in Iqaluit), while other emergency contacts are located in BC, Nova Scotia, California and Alaska. Can Sabina ensure that these emergency contacts can aid and/or advice in a timely manner in case of spills?</p> <p>Bird Hazing and Other Deterrents</p> <p>Section 8.4 describes Sabina’s wildlife protection procedures in response to a spill event. A combination of audible and visual devices will be used as wildlife deterrents, including</p>



	<p>but not limited to pyrotechnics, visual scare tactics, broadcast sounds, and exclusion. The KIA recommends that Sabina review the Bird Hazing Manual: Techniques and Strategies for Dispersing Birds from Spill Sites published by the University of California (Gorenzel & Salmon, 2008). Section G of this manual outlines the suggested hazing techniques for different bird groups and locations/conditions. Sabina should ensure that different deterrent options are available on site in case some techniques are shown to be less effective than others.</p> <p>Wildlife protection (hazing) equipment is not included in the “Resources Required” column of Tables 9-1, 9-2, and 9-3, which present different bulk fuel transfer spill scenarios. While the KIA recognizes that these tables focus on spill containment and cleanup, it is also important to bear in mind that additional mitigation measures will be needed if wildlife are present in the area and could be impacted by the spill. Furthermore, wildlife hazing equipment is not listed in Annex 4: Spill Response Equipment of the OPPP & OPEP. The only item listed that is explicitly for wildlife is “large nets (bird recovery)”, which would presumably be used after birds have already been impacted by the spill. Hazing equipment should be included to demonstrate that Sabina understands which techniques would be the most effective in different scenarios, and that Sabina is prepared to implement wildlife protection response in a timely manner.</p> <p>In addition to equipment, wildlife hazing requires trained personnel. In Section 8.4, Sabina states that <i>“Only workers trained in the safe and proper use of certain hazing equipment will be permitted to haze wildlife”</i> and <i>“To ensure alive oiled wildlife be dealt with humanely, capture and handling of wildlife shall only be done by trained and permitted individuals.”</i> However, training for wildlife hazing techniques and animal retrieval are not included in Section 10.1 (Training – General) of the OPPP & OPEP. Will Sabina ensure that there will always be trained individuals available for emergency response? Furthermore, how will workers be trained in hazing equipment if the specific types of equipment do not appear to have been decided upon?</p>
<p>Recommendation/Request</p>	<p>The KIA recommends/requests the following:</p> <ul style="list-style-type: none"> • Please clarify if there is a proposed staff list for the Technical Specialist positions that could possibly be assigned, as described in the OPPP & OPEP. Please also clarify if these are on-site staff or on-call from remote locations. • Please clarify the roles of the Emergency Contacts in case of spills affecting wildlife. If their assistance is required on site,



	<p>please explain how the contacts located in different provinces and countries will be able to respond in a timely manner.</p> <ul style="list-style-type: none"> • Please refer to Gorenzel & Salmon (2008) for bird group and location-specific hazing techniques that are known to be effective. Please incorporate these techniques and equipment into the lists of required equipment in the OPPP & OPEP. • Please clarify whether Sabina is providing training for wildlife hazing techniques and animal retrieval in case of spills, and whether there will always be trained staff on site.
Importance of Issue	Moderate

1.27 KIA-NIRB-27

Review Comment Number	KIA-NIRB-27
Subject/Topic	Waterbird staging areas maps in OPPP & OPEP vs. Fixed-Wing and Helicopter Operations SOP
References	<p>Sabina, Back River Project 2021 Annual Report (March 31, 2022)</p> <ul style="list-style-type: none"> • Project Certificate Conditions No. 60 • Appendix F. 2021 Pre-Construction Wildlife Mitigation and Monitoring Program Report (March 2022) <ul style="list-style-type: none"> ◦ Appendix 5A. Fixed-Wing and Helicopter Operations SOP – ENVIRO-03 • Appendix G. Marine Laydown Area Oil Handling Facility: Oil Pollution Prevention Plan & Oil Pollution Emergency Plan (September 2021)
Summary	Maps in the OPPP & OPEP and the Fixed-Wing and Helicopter Operations SOP show different waterbird staging areas. Important areas identified for spill response should also be considered during aircraft operations.
Detailed Review Comment	Figure 3-2 in the OPPP & OPEP shows the “5 ML Spill Sensitivity in Relation to Migratory Bird Staging Areas in Bathurst Inlet”. On this map, there are many locations considered as staging areas, with groups of waterfowl and waterbirds binned into 11-25, 26-100, and >100 individuals. It is unclear how the OPPP & OPEP sensitivity map relates to Figure 2 (Back River Project: Wildlife Features in the Project Area) in the Fixed-Wing and Helicopter Operations SOP, where only three waterbird staging areas are identified: one in “MLA South Bay”, one in “Duckpot (George Staging)”, and the entirety of Beechey Lake. Based on Figure 3-2 of the OPPP & OPEP, there are many more waterbird staging areas



	that pilots should be aware of, and mitigation actions taken when large groups of birds are present. By considering these additional areas, Sabina would demonstrate greater compliance with PC Condition No. 60.
Recommendation/Request	The KIA recommends/requests the following: <ul style="list-style-type: none"> • Please explain why there are many more waterbird staging areas identified for spill response as opposed to aircraft operations. If Figure 3-2 in the OPPP & OPEP shows known areas of concentration of waterfowl and other waterbirds, then pilots should be applying the same setbacks as described for waterbird staging areas in the Fixed-Wing and Helicopter Operations SOP.
Importance of Issue	Moderate

1.28 KIA-NIRB-28

Review Comment Number	KIA-NIRB-28 (Wildlife Consultant)
Subject/Topic	Terrestrial Environment – Permafrost Monitoring
References	<p>Sabina, Back River Project 2021 Annual Report (March 31, 2022)</p> <ul style="list-style-type: none"> • Project Certificate Condition No. 12 <p>Sabina, Back River Project, 2020 Annual Report (March 31, 2021)</p> <ul style="list-style-type: none"> • Project Certificate Condition No. 12 <p>Sabina, Back River Project, Responses to 2020 Annual Report Comments (July 6, 2021)</p> <ul style="list-style-type: none"> • Response to Kitikmeot Inuit Association, KIA-14
Summary	There is not any discussion of the results of monitoring permafrost conditions in response to site infrastructure.
Detailed Review Comment	<p>Project Condition 12 of the Project Certificate 007 states that “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.”</p> <p>Reporting requirements for Project Condition 12 of the Project Certificate 007 states that <i>“During construction, the Proponent shall, on an annual basis, <u>provide information regarding the results of monitoring and identifying any mitigation measures undertaken in fulfillment of this Term and Condition in the Proponent’s annual report to the Nunavut Impact Review Board.</u>”</i></p> <p>However, there is no reporting on results of permafrost monitoring.</p>



Recommendation/Request	<p>The KIA requests the following:</p> <ul style="list-style-type: none"> • Please provide the results of the geotechnical inspection(s), including applicable pictures, with an interpretation as to how the inspection relates to fulfilling PCs 11-13, along with the results of monitoring and identifying mitigation measures. • Please describe monitoring to identify project effects on permafrost conditions relative to all project infrastructure, including identifying any mitigation measures. • Please provide a definition of “major earthworks” as opposed to other sorts of earthworks.
Importance of Issue	Moderate

1.29 KIA-NIRB-29

Review Comment Number	KIA-NIRB-29
Subject/Topic	Climate and Meteorology / Greenhouse Gas Reduction Plan
References	Project Certificate Condition No. 6
Summary	<p>Under this condition, Sabina will have to monitor and reduce greenhouse gas emissions produced by the Project. It is understood that Sabina is continuing to implement their Greenhouse Gas (GHG) Reduction Plan mitigative and adaptive strategies.</p>
Detailed Review Comment	<p>Sabina is providing estimates for GHG emission as per the guidance document developed by Environment Canada in 2004. It is important to note that emissions from permafrost thaw are not included in this guideline and the magnitude of GHG emission from thawing permafrost is only slowly being researched and understood (Natali et al. 2021; Turetsky et al., 2020). It is possible that the GHG emission reported underestimate total emissions for the Project developing from permafrost disturbance.</p> <p>Susan M. Natali, et al., “Permafrost carbon feedbacks threaten global climate goals” Proceedings of the National Academy of Sciences, May 2021.</p> <p>Merritt R. Turetsky, et al., “Carbon release through abrupt permafrost thaw,” Nature Geoscience, February 2020.</p>
Recommendation/Request	<p>It is recommended that Sabina consider and monitor how permafrost thaw within the project area may impact project-related emission of GHG over the Project’s life, and to measure carbon fluxes using the eddy covariance technique.</p>
Importance of Issue	Moderate



1.30 KIA-NIRB-30

Review Comment Number	KIA-NIRB-30
Subject/Topic	Climate and Meteorology / Weather Monitoring and Adaptive Management
References	Project Certificate Condition No. 8
Summary	Some weather parameters that should be reported under this condition appear to be missing and changes to the assessment are recommended
Detailed Review Comment	<p>Sabina provides weather data for the Goose Station and compares those data with data from the Environment and Climate Change Canada (ECCC) Bathurst Inlet station and the climate normal (1981-2010) that had been generated by ECCC for Lupin. In addition, power failure resulted in data loss in November 2021.</p> <p>Only some of the data that are requested to be reported under PCC No.8 are presented, for example and as stated in PCC No. 8: the onset of seasonal freeze and thaw cycles, as well as a highlighting of weather extrema or outlying weather events were missing.</p>
Recommendation/Request	<p>It is recommended that the weather station at MLA be rehabilitated to obtain a better understanding of the regional climate conditions.</p> <p>It is requested that Sabina provides the missing information as per PCC No.8 in future reports.</p> <p>It is further recommended that comparison is made using satellite-derived weather data, for example those provided by NASA, in addition to the comparison to Lupin. Not only is the station at Lupin located ~224 km to the East from the project, but it is also affected by local conditions (Contwoyto Lake / large water body) and the climate normal data (1981 – 2010) are outdated, specifically considering the changes that have occurred over the last decade in the Arctic. As such, a comparison of the project weather data with the climate normal from Lupin does not provide information on evaluating extrema and abnormal weather conditions, which is the purpose of this condition.</p>
Importance of Issue	Moderate

1.31 KIA-NIRB-31

Review Comment Number	KIA-NIRB-31 (Geotechnical Engineering Consultant)
------------------------------	---



Subject/Topic	Terrestrial Environment / Permafrost Mapping and Monitoring
References	Project Certificate Condition No. 11
Summary	Sabina provided the 2021 Annual Geotechnical Report for the Goose Project Site. However, no recent information has been provided regarding the permafrost conditions even though such data should be made available during pre-construction to inform the detailed design of project infrastructure.
Detailed Review Comment	Sabina did not provide any new information regarding permafrost temperature, thickness of seasonal thaw and amount of ground ice in the project development area to improve the permafrost characterization. Sabina states that “Currently, Sabina has not constructed any waste or waste management infrastructure where permafrost monitoring thermistors can be installed to assess thermal conditions.” However, a monitoring program has been performed as part of the project development and any associated data should be collected and provided as they would provide ongoing baseline information. This condition not only refers to the thermal behaviour of new infrastructure, but also the existing environment. Sabina’s proposed next step, i.e. “During Construction, Sabina shall, on an annual basis, provide any additional permafrost mapping information documented in fulfillment of this T&C in Sabina’s annual report to the NIRB.” is not considered sufficient in the context of this condition as it would be limited to the construction project phase and new infrastructure.
Recommendation/Request	It is requested that Sabina collect and provide updated information on the permafrost characteristics annually, regardless of project phase and/or construction activities.
Importance of Issue	High

1.32 KIA-NIRB-32

Review Comment Number	KIA-NIRB-32 (Geotechnical Engineering Consultant)
Subject/Topic	Terrestrial Environment / Permafrost Monitoring
References	Project Certificate Condition No. 12
Summary	Similar to PCC No. 11 (KIA-NIRB-31), no new information has been provided.
Detailed Review Comment	The condition is not limited to the construction phase. Similar to PCC No. 11, recent data from existing permafrost monitoring is expected to be included in the annual geotechnical report as it provides ongoing baseline



	information and helps with improving the understanding of the local permafrost conditions. Together with the assessment of the weather conditions, it provides data that can be used to evaluate natural vs. project related environmental impacts.
Recommendation/Request	It is requested that Sabine provide updated information on the permafrost characteristics within the project area.
Importance of Issue	High

1.33 KIA-NIRB-33

Review Comment Number	KIA-NIRB-33
Subject/Topic	Aquatic Effects Monitoring Plan (AEMP)
References	Annual Report Section 4.5.7 Groundwater and Surface Water Quality
Summary	AEMP was not included in the annual report.
Detailed Review Comment	<p><i>“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.”</i></p> <p>The AEMP Report was not included within the Annual Report and therefore does not allow a determination as to whether project pre-development activities have had an impact on the aquatic environment (i.e., baseline water quality data from 2021 has not been disclosed). While we appreciate the Annual Report includes a summary of what field programs have occurred, an AEMP data report would permit an evaluation as to whether the existing Plan (dated October 2017) continues to meet the objective of the Project Certificate Condition.</p>
Recommendation/Request	Annual AEMP reports should be completed and appended to the project Annual Report in future years.



	Monitoring programs and associated results for all VECs should be summarized within the body of the Annual Reports in future years. This was also recommended in the 2020 report review but was not implemented. We note that without this information, this reviewer is unable to determine whether the existing AEMP continues to meet the objectives of the associated Project Certificate Condition.
Importance of Issue	High

1.34 KIA-NIRB-34

Review Comment Number	KIA-NIRB-34
Subject/Topic	Mine Site Inspection Results.
References	Annual Report Section 4.4.1 Agency Inspections and Site Visits
Summary	Results of site inspection not included in annual report.
Detailed Review Comment	<p>Sabina notes that the following inspections occurred in 2021:</p> <ul style="list-style-type: none"> - <i>"KIA (July 22 to 24): inspection of Goose Lake Camp, Marine Laydown Area, and George Lake Camp was conducted as per the KIA established inspection schedule.</i> - <i>CIRNAC (September 4): inspection of the Goose Lake Camp."</i> <p>No outcomes of these inspections were discussed in the annual report nor within the appendices.</p>
Recommendation/Request	Please include a summary of issues highlighted during project inspections and Sabina's response to them in future Annual Reports. This was also recommended in the 2020 review but was not implemented. It continues to be unclear whether issues have been identified by inspectors that remain unaddressed by the proponent.
Importance of Issue	Moderate

1.35 KIA-NIRB-35

Review Comment Number	KIA-NIRB-35
Subject/Topic	Waste Management Plan
References	Annual Report Project Certificate No. 14
Summary	The Waste Management Plan was not fully included in the annual report.
Detailed Review Comment	<i>"The Proponent shall provide a Waste Management Plan that</i>



	<p><i>describes how the local environment, including permafrost integrity and water quality, will not be harmed by wastes at project landfills.”</i></p> <p>The Waste Management Plan in full was not included in the Annual Report. The Tailings Management Plan is included in Appendix K, but it is unclear what other Management Plans are included in the licensing, as they are mentioned but not included in the Annual Report (i.e., Environmental Management and Protection Plan, Waste Rock Management Plan, Site Water Monitoring and Management Plan).</p>
Recommendation/Request	All monitoring programs and associated baseline results should be included/summarized in the Annual Reports in future years. For plans currently in development, we recommend Sabina indicate an estimated completion date for those plans.
Importance of Issue	High

1.36 KIA-NIRB-36

Review Comment Number	KIA-NIRB-06
Subject/Topic	Effluent discharge from TSF
References	Appendix K Section 5.2.7 Tailings Storage Facility Operations
Summary	No specific criteria for effluent discharges are provided for TSF.
Detailed Review Comment	<p><i>“Tailings water from the TSF supernatant pond will be recycled and reused in the Process Plant as reclaim water, with no planned discharge from the TSF during Operations. Should a controlled discharge be required during Operations, all effluent will meet relevant regulations or site-specific water quality objectives.”</i></p> <p>No clarification is given regarding the specific criteria that effluent and discharges will need to comply with (this information may be included in missing Management Plans).</p>
Recommendation/Request	Provide clarification on which water quality criteria will be used to identify exceedances in discharges (i.e., MDMER or more stringent).
Importance of Issue	High



1.37 KIA-NIRB-37

Review Comment Number	KIA-NIRB-37
Subject/Topic	HADDs
References	2.2.1.4 Fisheries and Oceans Canada
Summary	DFO determined that the annual report does not indicate (sic) that any work resulted in harmful alteration or disruption or destruction of fish habitat beyond the scope of the Proponent's current Fisheries Act Authorization.
Detailed Review Comment	Does this mean a HADD occurred, but was covered under the current Authorization?
Recommendation/Request	Please clarify whether any HADDs occurred to fish habitat.
Importance of Issue	Moderate

1.38 KIA-NIRB-38

Review Comment Number	KIA-NIRB-38
Subject/Topic	Outstanding Operational Management and Monitoring Plans
References	4.0 Findings
Summary	Sabina was required to submit operational plans and commence monitoring programs which may address the majority of issues noted in the 2019-2020 and 2020-2021 reporting periods and which are required under the Project Certificate for activities in the Construction Phase.
Detailed Review Comment	Monitoring programs were to commence in 2021. No results from these programs are presented in this report.
Recommendation/Request	The missing monitoring results should be reported as well as a comparison of the results with predicted results from the EIS. If the NIRB determined pre-construction had started, then monitoring for the activities that started should have been initiated. Appendix A only indicates active compliance for monitoring plans, but not actual monitoring.
Importance of Issue	Moderate

1.39 KIA-NIRB-39

Review Comment Number	KIA-NIRB-39
Subject/Topic	2021 monitoring program starts



References	Appendix A
Summary	<p>12. Monitoring and annual geotechnical inspections will begin in 2021.</p> <p>13. Monitoring and annual geotechnical inspections will begin in 2021.</p> <p>52. To be provided within one (1) year of construction. Note: the NIRB expects reporting on this Term and Condition in the 2021 annual Nunavut Impact Review Board File No. 12MN036 2020 – 2021 Monitoring Report 24 Back River Gold Mine Project report as the Project has been designated by the NIRB as being in construction as of 2020.</p>
Detailed Review Comment	Several monitoring programs are listed as not yet active and beginning in 2021. This report was submitted in November 2021. Unless the programs were to start in December 2021, their planned start dates should be changed.
Recommendation/Request	Update monitoring plan start dates.
Importance of Issue	Low

2.0 Hydrology and Hydrogeology – Management Plans

2.1 KIA-NIRB-40

Review Comment Number	KIA-NIRB-40
Subject/Topic	Goose Property Groundwater Inflows
References	Water Management Plan, Table 5.1-1, Amendment Type A Water Licence Application for Sabina Gold & Silver Corp. Back River Project (NWB File No. 2AM-BRP1831 Attachment 2-Appendix B-WaterMgmtPlan-IMLE).
Summary	Ground water flows indicated in annual report do not correspond to SRK groundwater model.
Detailed Review Comment	<p>Table 5.1-1 indicates groundwater inflows ranging from 0 m³/day to 75 m³/day at Umwelt Underground, between 70 m³/day to 190 m³/day at Llama Open Pit, and between 0 m³/day to 410 m³/day at Llama Underground.</p> <p>The estimates above mentioned seem different from the results of the Groundwater model developed by SRK as part of the hydrogeological baseline study in support of the Back River Project. The Hydrogeological Characterization and Modelling Report for the Project (October 2015) indicates that:</p> <ul style="list-style-type: none"> • Umwelt Underground groundwater inflow ranges between 0 m³/day and 596 m³/day;



	<ul style="list-style-type: none"> • Llama underground groundwater inflow ranges between 0 m³/day and 350 m³/day; • Llama open pit groundwater inflow ranges between 0 m³/day and 120 m³/day; inflow rates for the water balance model.
Recommendation/Request	KIA's consultant cannot comment on the updated groundwater inflow rates at this time. Once the updated groundwater model report will be made available, they will review the rationale of using different groundwater inflow rates for the water balance model.
Importance of Issue	High

2.2 KIA-NIRB-41

Review Comment Number	KIA-NIRB-41
Subject/Topic	Throughout the Water Management Plan Appendix D is referred to as the Water and Load Balance Report.
References	Water Management Plan, Appendix D, Amendment Type A Water Licence Application for Sabina Gold & Silver Corp. Back River Project (NWB File No. 2AM-BRP1831 Attachment 2-Appendix B-WaterMgmtPlan-IMLE).
Summary	Is Appendix C or D the Water and Load Balance Report?
Detailed Review Comment	Appendix D is cited several times throughout the Water Management Plan. Appendix D is implied as being "Water and Load Balance Report", which is referred as Appendix C in the Table of Contents section.
Recommendation/Request	Please clarify.
Importance of Issue	Moderate

2.3 KIA-NIRB-42

Review Comment Number	KIA-NIRB-42
Subject/Topic	Water consumption from Goose Lake
References	Water Management Plan, Table 7.3-1, Amendment Type A Water Licence Application for Sabina Gold & Silver Corp. Back River Project (NWB File No. 2AM-BRP1831 Attachment 2-Appendix B-WaterMgmtPlan-IMLE).
Summary	Total amount of Goose Lake water consumption maybe inaccurate.
Detailed Review Comment	Text: "During the life of the Project, water consumption requirements from Goose Lake include 1,500 m ³ /day of



	<p><i>freshwater year-round and an additional 400 m³/day during the open water season for a total of 1,900 m³/day”</i></p> <p>Table: Total Water Use: Goose Lake: 608,700 m³/year. Table should indicate: 584,300 m³/year if open water season is from July until September.</p>
Recommendation/Request	<p>The total amount on the table is not consistent with the text. Please clarify how many days are considered during open water season (July-September) and what the correct total volume is.</p>
Importance of Issue	Moderate

2.4 KIA-NIRB-43

Review Comment Number	KIA-NIRB-43
Subject/Topic	Inflows to Primary Pond
References	Water Management Plan, Table 8.1-1, Amendment Type A Water Licence Application for Sabina Gold & Silver Corp. Back River Project (NWB File No. 2AM-BRP1831 Attachment 2-Appendix B-WaterMgmtPlan-IMLE).
Summary	Inflows to Primary Pond are not presented.
Detailed Review Comment	The Echo Open Pit will commence during the Construction Phase (-2). Inflows pumped to Primary Pond is not indicated.
Recommendation/Request	Please add in Table 8.1-1: “, and inflows are pumped to the Primary Pond. “
Importance of Issue	Moderate

2.5 KIA-NIRB-44

Review Comment Number	KIA-NIRB-44
Subject/Topic	Saline Water Pond storage capacity.
References	Water Management Plan, 8.2.7 Saline Water Pond, Amendment Type A Water Licence Application for Sabina Gold & Silver Corp. Back River Project (NWB File No. 2AM-BRP1831 Attachment 2-Appendix B-WaterMgmtPlan-IMLE).
Summary	Alternate Saline Water storage to SWP.
Detailed Review Comment	Text: <i>“In the event of insufficient storage within the SWP before the Goose Main Reservoir is available, saline water can be transferred to the Llama TF once active in Year 6, or Umwelt Underground around Year 10 and Year 12, when the void spaces within the underground will be available.”</i>



Recommendation/Request	Please provide an alternative if there is insufficient storage within the SWP before Goose Main Reservoir is complete.
Importance of Issue	High

2.6 KIA-NIRB-45

Review Comment Number	KIA-NIRB-45
Subject/Topic	Guidance criteria for general site runoff.
References	Water Management Plan, 9.4 General Site Runoff, Amendment Type A Water Licence Application for Sabina Gold & Silver Corp. Back River Project (NWB File No. 2AM-BRP1831 Attachment 2-Appendix B-WaterMgmtPlan-IMLE).
Summary	Details are required on water runoff guidance criteria.
Detailed Review Comment	<i>Text: "Collected water or runoff that meets the criteria applicable water license criteria will be discharged to land, and where possible at a minimum setback of 31 m from a waterbody."</i>
Recommendation/Request	Please provide more details about the applicable guidance criteria and how the surface water runoff be testing plan to ensure the water meets application criteria.
Importance of Issue	Low

2.7 KIA-NIRB-46

Review Comment Number	KIA-NIRB-46
Subject/Topic	Treatment of water within Llama and Umwelt Lakes.
References	Water Management Plan, 7.4.2 Goose Property Water Treatment Plant, Amendment Type A Water Licence Application for Sabina Gold & Silver Corp. Back River Project (NWB File No. 2AM-BRP1831 Attachment 2-Appendix B-WaterMgmtPlan-IMLE).
Summary	Basis of the assumption for water treatment of water within Llama and Umwelt Lakes.
Detailed Review Comment	<i>Text: "it is assumed that 50% of the water within Llama and Umwelt Lakes will required to be treated for TSS before discharging to the Goose Lake"</i>
Recommendation/Request	Please provide the rationale for assuming that 50% of the water within Llama and Umwelt Lakes will require to be treated.
Importance of Issue	Low



2.8 KIA-NIRB-47

Review Comment Number	KIA-NIRB-47
Subject/Topic	Groundwater inflows from active layer or taliks below Llama and Umwelt Lakes.
References	Water Management Plan, 8.1.1 Lake Dewatering, Amendment Type A Water Licence Application for Sabina Gold & Silver Corp. Back River Project (NWB File No. 2AM-BRP1831 Attachment 2-Appendix B-WaterMgmtPlan-IMLE).
Summary	Consideration of groundwater inflows from active layer or taliks below Llama and Umwelt Lakes into Llama during dewatering.
Detailed Review Comment	<i>Text: "Llama Lake, which has a natural capacity of 0.96 M-m³, will be dewatered.....Umwelt Lake, which has a natural capacity of 0.24 M-m³, will be dewatered in Year -1."</i>
Recommendation/Request	<p>Please clarify if groundwater/water inflows from the shallow active layer or from taliks below Llama Lake and Umwelt Lake have been considered when considering dewatering volumes.</p> <p>To prevent groundwater/water inflow from the shallow active layer, the construction of diversion berms around Llama Lake during Phase 1 might be explored. Based on Figure A-06 and Figure A-07, diversion berms will be constructed around the Llama pit only during Phase 2.</p>
Importance of Issue	High

2.9 KIA-NIRB-48

Review Comment Number	KIA-NIRB-48
Subject/Topic	Sequence of dewatering of Llama and Umwelt Lakes
References	Water Management Plan, 8.1.1 Lake Dewatering, Amendment Type A Water Licence Application for Sabina Gold & Silver Corp. Back River Project (NWB File No. 2AM-BRP1831 Attachment 2-Appendix B-WaterMgmtPlan-IMLE)
Summary	Clarification on the sequence of dewatering of Llama and Umwelt Lakes.
Detailed Review Comment	<i>Text: "Effluent will be discharged to Umwelt Lake and ultimately flow into Goose Lake.....Umwelt Lake, which has a natural capacity of 0.24 M-m³, will be dewatered in Year -1. Similar to Llama Lake, it is assumed that only 50% of the lake water volume will be suitable for direct discharge."</i>



Recommendation/Request	Approximately 0.48 M-m ³ will be discharged from Llama Lake to Umwelt Lake. This will increase the volume of water to be dewatered from Umwelt Lake to 0.72 M-m ³ . Please clarify the development sequence for dewatering management activities at Llama and Umwelt Lakes to avoid duplicates in treating water at the Water Treatment Plan.
Importance of Issue	Moderate

2.10 KIA-NIRB-49

Review Comment Number	KIA-NIRB-49
Subject/Topic	Diversion berms around Saline Water Pond (SWP)
References	Water Management Plan, 8.1.1 Lake Dewatering, Amendment Type A Water Licence Application for Sabina Gold & Silver Corp. Back River Project (NWB File No. 2AM-BRP1831 Attachment 2-Appendix B-WaterMgmtPlan-IMLE).
Summary	No diversion berms are around east side of SWP.
Detailed Review Comment	Text: <i>“Saline Water Pond to be constructed around the existing extents of Umwelt Lake.”</i>
Recommendation/Request	Figure A-07 shows that the Saline Water Pond (SWP) will be completed with a SWP containment dam along the south portion. SWP Diversion Berms will be placed on the North and West side of the SWP to avoid freshwater inflow into the SWP. No containment or diversion structures will be constructed on the East side of the SWP. The potential of saline water seepage into the Umwelt Pit should be discussed and the risks quantified by the proponent. Should they be required, mitigation measures should be proposed.
Importance of Issue	Moderate

2.11 KIA-NIRB-49

Review Comment Number	KIA-NIRB-49
Subject/Topic	Runoff water contact with Waste Rock Storage Area
References	Waste Rock Management Plan, 5.4.1.1 Umwelt Waste Rock Storage Area, Amendment Type A Water Licence Application for Sabina Gold & Silver Corp. Back River Project (NWB File No. 2AM-BRP1831 Attachment 2-Appendix B-WaterMgmtPlan-IMLE).



Summary	Construction of diversion berms around WRSA.
Detailed Review Comment	Text: <i>“One small stream and two ponds are located within the footprint, or immediately upstream, of the Umwelt WRSA and will be covered by the facility (2020 Modification Package Appendix A, Figure 3).”</i>
Recommendation/Request	Runoff water is expected to flow toward the former small stream and potentially come into contact with waste rocks (both PAG and non-PAG). The constructions of structures, such as diversion berms should be explored, to reduce the risk of surface runoff towards the WRSA.
Importance of Issue	Moderate

3.0 Goose Lake Camp site – 2021 Geotechnical Annual Report

As noted above in comments on the Back River Project 2021 Annual Report to NIRB, the annual geotechnical report was provided by Sabina. The following is KIA’s geotechnical engineering consultant’s review the 2021 Geotechnical Annual Report.

REVIEW COMMENTS

SRK provided detailed observations and recommendations for the various infrastructure components and reiterated several overarching design and operating principles as they relate to geotechnical stability, design, and performance. Based on the information available SRK did not visit instrumentation on site and no updated information on the conditions of the temperature monitoring sensors and/or data loggers was provided. SRK concluded that “notwithstanding the observations and recommendations presented in this AGI [...] the Back River site is performing in reasonable accordance with predicted geotechnical expectations.” BGC agrees with the findings presented by SRK, with their following recommendations:

- 1) *“Sabina is reminded to consult the appropriate site-specific reference materials when designing and constructing new pads and roads.” and “[...] often key observations are near areas where surface water was noted to be flowing into or below infrastructure, or along the toes and outside crest of the roads, airstrip and pads.”* In other words, drainage control should be a key consideration since geotechnical instability is frequently associated with poor drainage control.
- 2) Sabina should “take special precautions to limit vehicle traffic within 1 m from all shoulders.” This is of particular importance during August and September when the maximum active layer thickness has developed, and embankment foundations are most vulnerable. This was also reported by BGC (August 27, 2021).



3) The Rascal Diversion should be constructed sooner rather than later to minimize ponding against the Goose Airstrip and the associated impacts on permafrost degradation. SRK noted that “many of the areas of the roads, and area along the southwestern side of the Goose Airstrip expansion had fill thicknesses less than the final design thickness.” As per the initial recommendation made by SRK, it is key that fill is placed at final design thicknesses as soon as practical to minimize thermal disturbance of the permafrost foundation.

4) In total, Sabina has installed 36 thermistors, of which 21 are reported to have permanent data loggers. However, the last readings were in 2015 or earlier with various data gaps and some questionable readings, left uncommented. SRK recommended that Sabina complete a full review of the onsite ground temperature data in 2022. As indicated in the 2021 AGI, Sabina is in the process of developing a Goose site wide thermal and permafrost monitoring plan. SRK recommended incorporating any active ground temperature monitoring locations into the site-wide plan. BGC supports this recommendation, as the data will provide baseline measurements for assessing the impacts of the project’s development activities on site permafrost conditions.

Not reported in the 2021 AGI, but documented by BGC (August 27, 2021), the gravel pad at the Umwelt Underground Warehouse and Machine Shop is deforming, likely in response to permafrost degradation, resulting in a 4° tilt of the fuel tank and sink holes forming under the generator. These areas should be assessed and fixed. If left as is, continued pad deformation may damage equipment and facilities stored on the pad.

SUMMARY

In summary, BGC agrees with the findings and recommendations presented by SRK in the 2021 AGI. In particular, BGC supports the recommendations listed in Table 1.

Table 1. Summary of recommendations.

Recommendation	Rationale
Manage surface drainage and water course crossings (culverts and bridges) to minimize ponding along embankments.	Ponding enhances permafrost degradation and associated instabilities.
Follow Designer’s recommendations for fill thickness when constructing and maintaining roads, airstrips, and gravel pads.	Constructed fill layer thickness less than the final design thickness can lead to permafrost degradation and instabilities.
Implement the Goose site-wide thermal and permafrost monitoring plan in 2022.	Collect baseline geothermal data to assess impacts of project development on site permafrost conditions.
Include MLA in future AGI’s and areas along the WIR if and when fill is placed.	To confirm that the project’s surface infrastructure at the MLA is performing as



P.O. Box 360
Kugluktuk, NU X0B 0B0
Telephone: (867) 982-3310
Fax: (867) 982-3311
www.kitia.ca

	intended from a geotechnical perspective.
--	---

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