Sabina
GOLD & SILVER CORP.

MEMO

October 2017

Re: Conceptual Fish Offsetting Plan

As part of the Nunavut Impact Review Board (NIRB) process, Sabina Gold & Silver Corp. (Sabina) had committed to the following under the Conceptual Fish Offsetting Plan:

- The Proponent will continue to work with Fisheries and Oceans Canada (DFO) and the impacted communities at the regulatory approval stage to develop a detailed fish-out and offsetting plan (DFO-C-2).
- The Proponent commits to working in conjunction with Kitikmeot Inuit Association in the permitting phase as it relates to fisheries impacts and compensation, to review the offsetting plan as required under the *Fisheries Act* (KIA-C-5).
- The Proponent commits to actively involve the Kitikmeot Inuit Association in the adaptive management of the fish offsetting plan (KIA-C-6).
- The Proponent commits to actively involve the Kitikmeot Inuit Association in evaluating early outcomes from monitoring and updating fish offsetting plans (KIA-C-7).

Sabina remains committed to following through with the above commitments as part of the Regulatory phase of the Project.

Should you require any additional information please feel free to contact me.

Yours truly,

Matthew Pickard
Vice President, Environment and Sustainability
Sabina Gold & Silver Corp.
#375 – 555 Burrard Street
Box 220
Vancouver, BC V7X 1M9

BACK RIVER PROJECT
CONCEPTUAL FISH OFFSETTING PLAN

February 2017
Project #1545534-9000-9000

Citation:
Golder. 2017. Back River Project: Conceptual Fish Offsetting Plan. Prepared for Sabina Gold & Silver Corp. by Golder Associates Ltd.

Prepared for:

Sabina Gold & Silver Corp.

Prepared by:

Golder Associates Ltd.

BACK RIVER PROJECT
CONCEPTUAL FISH OFFSETTING PLAN

Table of Contents

List of Figures

FIGURE **PAGE**

List of Tables

TABLE **PAGE**

List of Plates

PLATE **PAGE**

List of Appendices

Glossary and Abbreviations

Terminology used in this document is defined where it is first used. The following list will assist readers who may choose to review only portions of the document.

CRA	commercial, recreational, or Aboriginal
CPUE	Catch per unit effort
DFO	Fisheries and Oceans Canada
FEIS	Final Environmental Impact Statement
GIE	Goose Inflow East
Golder	Golder Associates Ltd.
ha	Hectare(s)
HTO	Hunters' and Trappers' Organization
KIA	Kitikmeot Inuit Association
km	Kilometre(s)
LSA	Local Study Area
m^3/s	Cubic metres per second
MLA	Marine Laydown Area
NTKP	Naonaiyaotit Traditional Knowledge Project
PIT	Passive Integrated Transponder
Project, the	The Back River Project
RSE	Rascal Stream East
TF	Tailings Facility
TK	Traditional Knowledge
TSF	Tailings Storage Facility
VEC	Valued Ecosystem Component
WRSF	Waste Rock Storage Areas

1. Introduction

1.1 PURPOSE

The proposed Back River Project (the Project) lies in western Nunavut in the continuous permafrost zone of the continental Canadian Arctic. It is composed of two main areas: the Marine Laydown Area (MLA) and the Goose Property Area (Goose Property; Figure 1.1-1).

The MLA is located on the western shore of Southern Bathurst Inlet, approximately 130 kilometres (km) north of the Goose Property (Figure 1.1-2). Here, the Project will sealift materials and supplies through Bathurst Inlet to the MLA annually during the open-water season only. Ships could travel via either the eastern or western portion of the Northwest Passage and then south in to Bathurst Inlet. It is estimated that between three and five vessels will report to the MLA for annual resupply and fuel as part of the Project. Key Project infrastructure for the Back River MLA includes the following:

- a temporary Lightering Barge Terminal;
- water intake pipe and desalination discharge pipe; and,
- the winter road where it crosses the Bathurst Inlet from the MLA to the Goose Property Area.

Mining will be completed using both open pit and underground methods. The Goose Property includes four open pits and four underground developments and the Project has an estimated mine life of ten years with a total production of 19.8 million tonnes (Mt) of ore (Figure 1.1-3). Key Project infrastructure at the Goose Property includes:

- four open pits, and four underground mines (Umwelt, Llama, Goose Main, and Echo);
- four waste rock storage areas;
- tailings storage facility (TSF);
- underground mining pads;
- a stockpile;
- camp;
- process plant; and,
- airstrip and roads, including a culvert for the haul road crossing.

The current mine plan includes the development of the Llama deposit, which is located under Llama Lake, and the construction of the Saline Water Pond at Umwelt Lake. Llama Lake and Umwelt Lake will be fished-out prior to the development of those Project components. Thus, the dewatering of Llama and Umwelt lakes for mining operations, and the construction of related infrastructure to support these activities is expected to result in unavoidable serious harm to fish (as defined in the *Fisheries Act*; see Section 1.1.1). The purpose of the Conceptual Fish Offsetting Plan (Chapter 21), a part of the Final Environmental Impact Statement (FEIS), is to summarize anticipated Project effects on fish and fish habitat, describe the option considered for offsetting (i.e., 'Bernard Harbour'), and outline a proposed conceptual plan to offset the serious harm to fish according to the Fisheries and Oceans Canada (DFO) Policy (DFO 2013a,b).

The development of the conceptual plan and the identification of the Bernard Harbour offsetting option within the plan is the result of continued community and regulatory engagement associated with the Project. The conceptual plan should demonstrate that it is reasonable to assume at this time that a feasible offsetting option exists, and that a Final Fish Offsetting Plan can be implemented for the Project. The Final Fish Offsetting Plan will be developed during the permitting phase of the Project.

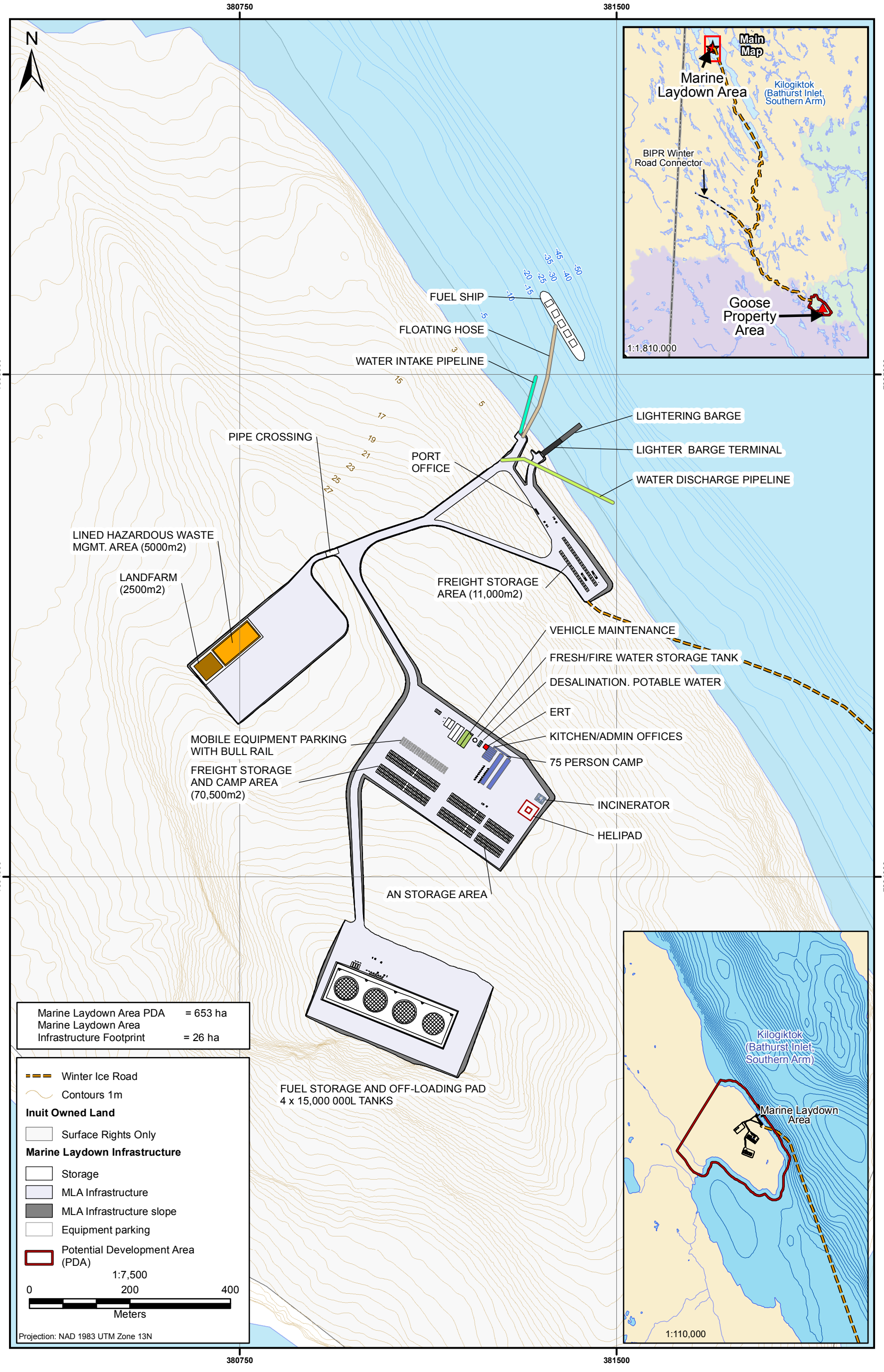
Figure 1.1-1

Sabina
GOLD & SILVER CORP.

Project Location

GIS # BR_FEIS_NA_tab_MLASiteLayout_v1

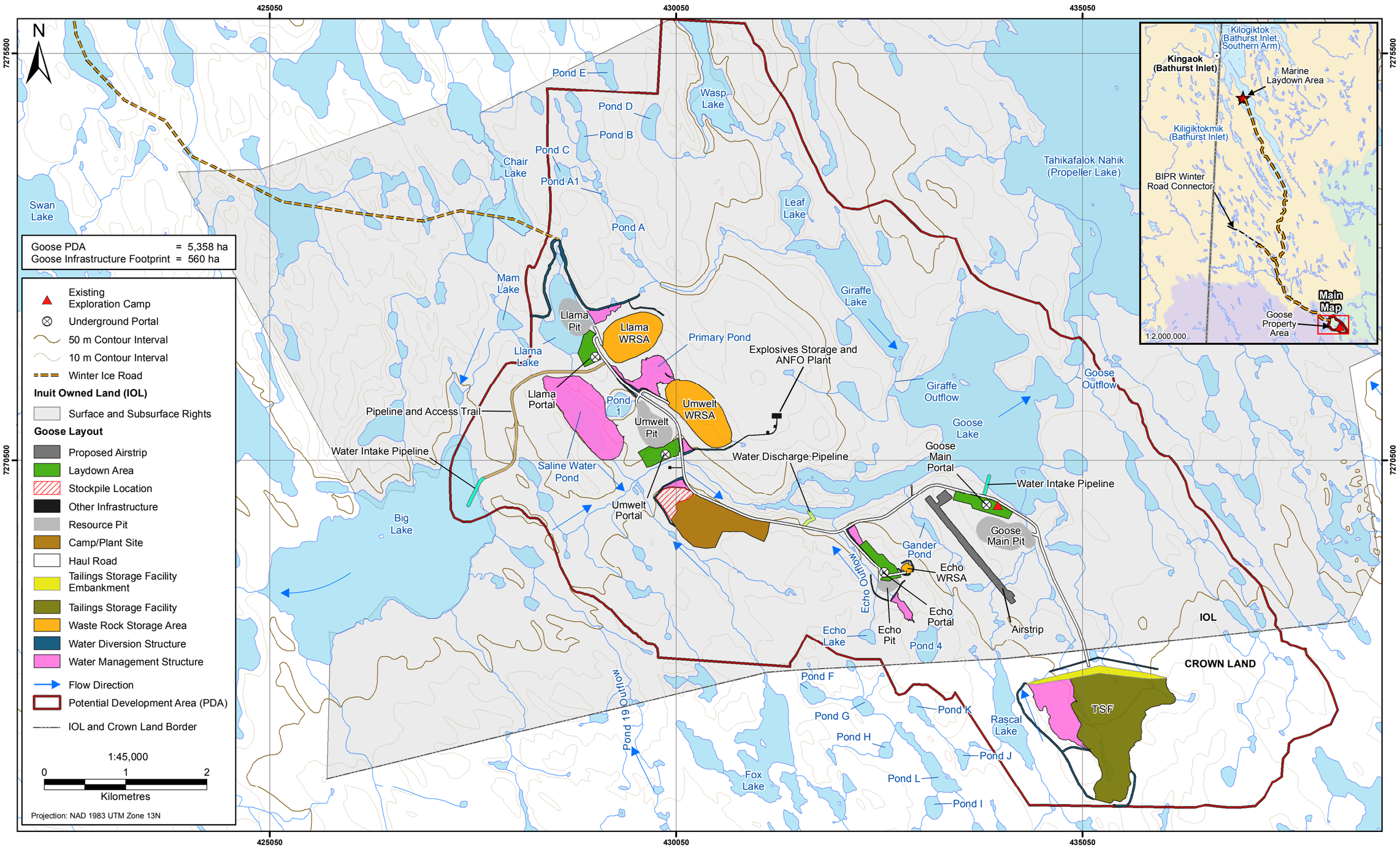
August 04 2015



Sabina GOLD & SILVER CORP.

Figure 1.1-2

Potential Development Area and Layout
Marine Laydown Area



Sabina GOLD & SILVER CORP.

Potential Development Area and Layout
Goose Property Area

Figure 1.1-3

1.1.1 Requirements under the *Fisheries Act*

Subsection 35(1) of the *Fisheries Act* prohibits the carrying on of a work, undertaking, or activity that results in serious harm to fish[1] that are part of a commercial, recreational, or Aboriginal (CRA) fishery or to fish that support such a fishery. However, where it is not possible to completely avoid serious harm to fish such that some residual serious harm to fish remains, an authorization under paragraph 35(2)(b) of the *Fisheries Act* is required to carry on a work, undertaking, or activity. A *Fisheries Act* Authorization will be required for the Project.

The Application for Authorization must include the following information:

- description of proposed work, undertaking, or activity;
- project engineering specifications, scale drawings, and dimensional drawings (for physical works);
- timeline information;
- location information;
- description of fish and fish habitat (aquatic environment);
- description of potential effects on fish and fish habitat;
- description of measures and standards to avoid or mitigate serious harm to fish;
- description of the residual serious harm to fish;
- offsetting plan; and,
- letter of credit, as security for completion of the offsetting plan.

An offsetting plan is developed to undertake offsetting measures to counterbalance the unavoidable residual serious harm to fish from the Project, with the goal of maintaining or improving the productivity of the CRA fishery. DFO's approach to offsetting is described in the Fisheries Protection Policy Statement (DFO 2013a) and Fisheries Productivity Investment Policy (DFO 2013b). A Final Fisheries Offsetting Plan will be produced during the permitting phase of the Project with engagement of local communities and will need to be submitted as part of the Application for Authorization under the *Fisheries Act*. The plan would be approved by DFO as a condition of the Authorization.

As described in the Fisheries Productivity Investment Policy (DFO 2013b), an offsetting plan must include information about the objectives of the offsetting measures, the measures to offset residual serious harm to fish, an analysis of how the offsetting measure will meet their objectives (i.e., methodology used and estimate of the offset), schedule for implementation, and monitoring. Offsetting measures are focused on improving fisheries productivity. The preference of DFO is that offsets occur near a project or within the same watershed; however, offsetting measures can be undertaken in waterbodies or for fish species other than those affected by the project, provided the measures are supported by clear fisheries management objectives or regional restoration priorities. Offsetting plans are negotiated with DFO on a case-by-case basis and would require engagement with Aboriginal groups. Offsetting measures should meet the following principles:

[1] "Serious harm to fish" is defined in Subsection 2(2) of the *Fisheries Act* and means "the death of fish or any permanent alteration to, or destruction of, fish habitat".

1) offsetting measures must support fisheries management objectives or local restoration priorities;

2) benefits from offsetting measures must balance project effects;

3) offsetting measures must provide additional benefits to the fishery; and,

4) offsetting measures must generate self-sustaining benefits over the long term.

The three general categories of offsetting measures include: Habitat Restoration and Enhancement; Habitat Creation; and, Chemical or Biological Manipulations. Habitat restoration and enhancement includes physical manipulation of existing habitat to improve habitat function and productivity; examples include:

- placement of material to improve habitat structures (e.g., spawning beds or reefs);
- increasing shoreline complexity;
- river bank stabilization and re-vegetation of riparian areas;
- improving access to off-channel habitats;
- removal of anthropogenic barriers to fish migration; and,
- enhancement of vegetated areas in lakes.

Habitat creation involves the development or expansion of aquatic habitat into a terrestrial area, such as creation or expansion of natural stream channels, lakes, side channel habitats, wetlands, or bays. Chemical or biological manipulations may include chemical manipulation of waterbodies or stocking of fish; however, these measures should be used only when the other groups of offsetting measures are not available, and only under specific circumstances, such as where the site-specific issues are well understood, the limitations to fisheries productivity are known, and fisheries management plans contain clear objectives for the fishery (DFO 2013b).

In remote, pristine areas where there is a lack of information about fisheries productivity and where offsetting opportunities are limited, such as near the Project, complementary measures may be considered in addition to other offsetting measures. Complementary measures may include data collection and/or scientific research related to maintaining or enhancing the productivity of CRA fisheries. According to DFO Policy, complementary measures may comprise up to 10 percent (%) of the required amount of offsetting, with the remaining 90% consisting of one or more projects that fall under the habitat enhancement, restoration, creation, or manipulation categories of offsetting measures.

2. Community and Regulatory Engagement

2.1 COMMUNITY ENGAGEMENT

Sabina has regularly engaged local communities and representatives of the Kitikmeot Inuit Association (KIA) on the Project. This has included engagement on various topics, such as fish offsetting requirements for the Project and, more specifically, the Bernard Harbour restoration project.

2.1.1 Back River Project

Sabina has been conducting community engagement and consultation activities for the Project since June 2012. During this time, dozens of meetings have been held with the public, Sabina's two community advisory groups in Cambridge Bay and Kugluktuk, local Hamlets, Hunters and Trappers Organizations (HTOs), youth, and other stakeholder groups. Approximately 185 community and stakeholder meetings on the Project were held prior to the November 2015 FEIS submission, during which time a substantial amount of feedback was received by the Company. Since the November 2015 FEIS submission, nearly 50 additional meetings with community and stakeholder representatives have been held on the Project (for a total of over 230 Project-related meetings to-date).

The focus of the engagement activities has generally been on the communities of Cambridge Bay, Kugluktuk, Bathurst Inlet, Bay Chimo, Gjoa Haven, Taloyoak, Kugaaruk, and Yellowknife. For example, public meetings were held in various communities in June 2012, November 2012, April 2013, August 2013, November 2013, June 2015, June 2016, July 2016, and November-December 2016. One-on-one meetings with community stakeholder groups have also been held at various times. The Nunavut Impact Review Board has additionally held public meetings on the Project in February 2013, March/April 2014, November 2014, and April 2016.

In addition to providing information to local communities on development plans for the Project, Sabina has discussed various topics, such as fish offsetting, tailings and contaminant management strategies, lake dewatering, potential fisheries and water-related effects, and other environmental management and monitoring-related topics. Copies of public meeting presentations made by Sabina can be found on www.backriverproject.com under the 'Additional Resources' tab. A complete list of the various stakeholder meetings Sabina has hosted or participated in since June 2012 is included in FEIS Addendum Appendix V3-1A.

Numerous questions, issues, and suggestions have been raised by local residents over the course of Sabina's public consultation and engagement program. Generally, communities have expressed support for the opportunities the Project will provide, but have also strongly expressed the need for the Project to be developed in a manner that is safe for both people and the environment. Particular concern has been expressed about potential long-term effects on fish, other wildlife resources, water quality, and from mine tailings and contaminants. Comments received during Sabina's public consultation and engagement program have been incorporated into a comprehensive public consultation database. This database contains over 165 topic directories and includes comments made by the public and information on when, where, and the forum in which the comments were made.

Topic directories (and the number of times a related comment was made) with potential relevance to fish offsetting requirements for the Project are presented in Table 2.1-1. Appendix V3-1G of the FEIS provides a full summary of the topics contained in Sabina's public consultation database, while FEIS Addendum Appendix V3-1C contains copies of all June 2012 – June 2015 meeting minutes and public comment forms from which the summary was developed. FEIS Addendum Appendix V3-1C also includes

meeting minutes and public comment forms for meetings held since the FEIS submission (up to February 2017).

Table 2.1-1. Example Topics Discussed and Related Number of Comments per Topic Made During Sabina's Public Consultation and Engagement Program

Back River Discussion Topic	Number of References by Community Members
Acid rock drainage	4
Environmental monitoring	35
Blocking watercourses	2
Dewatering of lakes	21
Mine contaminants and waste	77
Tailings	78
Waste rock	6
Water quality, quantity, and management	62
Wildlife – Fish	57

Sabina has gone through extensive effort to minimize or eliminate potential negative environmental and socio-economic effects in these areas. For example, a comprehensive environmental management and monitoring program has been developed, which addresses key areas of concern for local communities that were identified during public consultation. More details on Sabina's commitments to addressing community-identified issues are provided in Volume 3 (Public Consultation, Government Engagement, and Traditional Knowledge) of the FEIS.

All of the Project's existing camps and proposed infrastructure are located within the Kitikmeot Region. Accordingly, The KIA has been engaged on a regular basis by Sabina. Periodic site visits have been arranged for KIA board members and members of the KIA Lands, Environment and Resources Department, and the KIA has been kept informed of Sabina's various Project developments. The KIA is additionally responsible for issuing licences related to land and water use on Inuit Owned Land in the Kitikmeot Region, and Sabina is required to post reclamation security and negotiate wildlife compensation with them. Sabina is also required under the Nunavut Agreement to negotiate an Inuit Impact and Benefit Agreement (IIBA) with the KIA. As such, regular communication pertaining to these matters has occurred between Sabina and the KIA throughout the Project's development. The KIA has likewise been an active reviewer and participant in the environmental assessment of Sabina's Back River Project.

2.1.2 Back River Offsetting Option

Sabina's commitment to the offsetting option proposed in the Conceptual Fish Offsetting Plan (i.e., Bernard Harbour) began in mid-2014. Since that time, Sabina has engaged local residents about the offsetting option in a number of ways (see Table 2.1-2). Foremost, Sabina has partnered with the Kugluktuk HTO in the planning and execution of the Bernard Harbour option. Stream remediation (or enhancement) activities in the Nulahugyuk Creek - Hingittok Lake system in the Kitikmeot Region of Nunavut (also known as Bernard Harbour) were initially proposed in the early 2000s by the Kugluktuk HTO. The Kugluktuk HTO has since worked closely with Golder Associates Ltd. (Golder) to advance early stages of the project (e.g., initial environmental baseline and habitat enhancement work) and, for some time, the two organizations were seeking an industry partner to help advance the project to completion.

Sabina was identified as an industry partner in early 2014 and has since advanced the planning and implemented the Bernard Harbour offsetting option in cooperation with the Kugluktuk HTO. Details on

the relationship between the Kugluktuk HTO and Sabina in executing the Bernard Harbour offsetting option have been captured in the 'Bernard Harbour Restoration Project Agreement' between: The Kugluktuk Hunters and Trappers Organization and Sabina Gold & Silver Corp (see Appendix A), signed by both parties in June 2014, and later renewed in January 2017. Importantly, the Bernard Harbour offsetting option is to remain a Kugluktuk HTO-led initiative with Sabina providing support to the Kugluktuk HTO and ensuring that the objectives of the offsetting plan are achieved.

The Kugluktuk HTO has remained involved in the Bernard Harbour offsetting option through semi-regular planning meetings and updates. The Kugluktuk HTO has also been instrumental in the planning and execution of baseline studies and initial remediation work (in cooperation with Golder), and in the planning of future remediation of Bernard Harbour. While the activities, meetings, and correspondences associated with this baseline and initial work are not included in Table 2.1-2, they are reflected in the associated baseline reports that have been prepared by Golder (ANL and Golder 2005; Golder and ANL 2007; Golder 2013a). The Kugluktuk HTO has also played a key role in the Traditional Knowledge (TK) study that was conducted for the Bernard Harbour Offsetting Option (for more details, see Appendix V3-3D of the FEIS, or a summary of the TK study provided further below).

The Kugluktuk general public have been engaged about the Bernard Harbour restoration project in different ways. For example, a public meeting was held in Kugluktuk on June 17, 2015 where results of the Bernard Harbour TK study, results of baseline fieldwork, and plans for the Bernard Harbour offsetting option were presented by Sabina representatives. Another public meeting was held on June 7, 2016 to discuss the Project and the offsetting option. The offsetting option was also briefly reviewed with representatives of Sabina's Community Advisory Group in Kugluktuk and the Hamlet of Kugluktuk during June 2015 community meetings held for the Project. Various members of the Kugluktuk public have also assisted in the baseline fieldwork and initial stream enhancement work that has been conducted at Bernard Harbour (ANL and Golder 2005; Golder and ANL 2007; Golder 2013a).

Local residents generally appear very supportive of the remediation work planned for Bernard Harbour and wish to see the Bernard Harbour Arctic Char fishery returned to its previous status. The Kugluktuk HTO and those residents who have previously lived at Bernard Harbour (e.g., many of the TK study participants) have expressed a particular desire to see the offsetting option completed. A number of individuals have stated they appreciate the low impact approach that is being used (e.g., no use of heavy equipment) and the involvement of community members (including youth) in the project. Sabina intends to continue engaging the residents of Kugluktuk as necessary as the Bernard Harbour restoration project advances.

The KIA has been kept informed of plans for the Bernard Harbour offsetting option through semi-regular meetings and correspondence. A KIA representative additionally participated in a Bernard Harbour site visit hosted by Sabina in July 2014, where Golder's initial remediation work was examined and future offsetting plans were discussed. The KIA has also been provided with copies of the TK study data, so that it may be incorporated into their Naonaiyaotit Traditional Knowledge Project (NTKP) database. It is understood the KIA may utilize this information for their own purposes in the future. The data and results of the TK study are also intended to be freely shared with other Nunavut organizations that may benefit from its use.

Other members of the Nunavut and Northwest Territories public have been made aware of the Bernard Harbour offsetting option. For example, the project was briefly reviewed in the communities of Cambridge Bay, Taloyoak, Kugaaruk, and Yellowknife during June 2015 community meetings held for the Back River Project (a visit to Gjoa Haven had to be re-scheduled). Two presentations on Bernard Harbour were additionally made by Sabina representatives at the 2015 Nunavut Mining Symposium held in Iqaluit, where various community, government, and industry stakeholders participated. A full list of community engagement activities undertaken by Sabina in regards to the Bernard Harbour offsetting option can be

found in Table 2.1-2. Sabina will continue to engage northern residents as necessary on the Bernard Harbour restoration project as it advances.

Table 2.1-2. Community Engagement Activities Conducted by Sabina Regarding the Bernard Harbour Restoration Project

Location / Date	Individual(s) / Organization	Description
Kugluktuk		
March 19, 2014	David Nivingalok (Chairperson) and Kevin Klengenberg (Secretary-Treasurer), Kugluktuk HTO	Teleconference to discuss proposed fish offsetting work to be conducted at Bernard Harbour.
March 25, 2014	Kugluktuk HTO	Meeting to discuss proposed fish offsetting work to be conducted at Bernard Harbour and the associated TK study.
April 29, 2014	Kugluktuk HTO	Meeting to discuss 'Kugluktuk HTO-Sabina Bernard Harbour Restoration Project Agreement'.
June 1-6, 2014	Selected elders and knowledge holders	A series of traditional knowledge interviews were held with selected elders and local knowledge holders as a component of proposed fish offsetting activities in the Bernard Harbour, Nunavut area. A project overview meeting/presentation was also held with local study participants prior to the interviews commencing.
July 13, 2014	Bernard Harbour TK study participants, HTO chairperson, and acting HTO manager	A TK study results verification meeting was held with participants in the Bernard Harbour TK study and with the Kugluktuk HTO chairperson and acting manager. Various clarifications were made by the participants, which were later incorporated into the final TK study report.
July 17, 2014	Kugluktuk HTO chairperson	The chairperson of the Kugluktuk HTO accompanied Sabina representatives and various other attendees during a day-long site visit to Bernard Harbour.
February 12, 2015	Kugluktuk HTO representatives	Sabina met with the Kugluktuk HTO chairperson, treasurer, and manager to provide an update on the Bernard Harbour restoration project and TK study.
February 17, 2015	Kugluktuk HTO	Letter and copy of the draft 'Traditional Knowledge Study Report on the Arctic Char Fishery in the Nulahugyuk Creek – Hingittok Lake Area (Bernard Harbour), Nunavut' provided to the HTO.
April 21, 2015	Kugluktuk HTO	Final copy of the 'Traditional Knowledge Study Report on the Arctic Char Fishery in the Nulahugyuk Creek – Hingittok Lake Area (Bernard Harbour), Nunavut' provided to the HTO.
May 8, 2015	Barbara Adjun, Kugluktuk HTO Manager	Phone update on the Bernard Harbour offsetting option.
May 21, 2015	David Nivingalok, Kugluktuk HTO Chairperson	Phone update on the Bernard Harbour offsetting option.
June 17, 2015	General public	Public meeting – Project update and FEIS submission overview. The results of the Bernard Harbour TK study and plans for Bernard Harbour were reviewed.
June 18, 2015	Kugluktuk Community Advisory Group	Project update and FEIS submission overview. Plans for Bernard Harbour were briefly reviewed.
June 18, 2015	Kugluktuk HTO	Project update and FEIS submission overview. The results of the Bernard Harbour TK study and plans for the Bernard Harbour were reviewed.

(continued)

Table 2.1-2. Community Engagement Activities Conducted by Sabina Regarding the Bernard Harbour Restoration Project (completed)

Location / Date	Individual(s) / Organization	Description
June 19, 2015	Hamlet of Kugluktuk	Project update and FEIS submission overview. Plans for Bernard Harbour were reviewed.
July 8, 2015	David Nivingalok, Kugluktuk HTO Chairperson	Letter providing information on the 2015 Bernard Harbour work proposal.
June 7, 2016	General public	Public meeting – Project Update and Back River Offsetting Plan presented to community.
June 8-9, 2016	Kugluktuk HTO and Invited Participants	Bernard Harbour Restoration Project Workshop
November 9, 2016	Kugluktuk HTO	Conference call – results from 2016 field program were presented and discussed.
December 2, 2016	Kugluktuk HTO	Project update, Bernard Harbour project update, and update on revised Wildlife Mitigation and Monitoring Program
Cambridge Bay		
June 7-10, 2014	Selected elders and knowledge holders	A series of traditional knowledge interviews were held with selected elders and local knowledge holders as a component of proposed fish offsetting activities in the Bernard Harbour, Nunavut area.
June 15, 2015	Cambridge Bay Community Advisory Group	Project update and FEIS submission overview. Plans for the Bernard Harbour offsetting option were briefly reviewed.
June 16, 2015	Hamlet of Cambridge Bay Representatives	Project update and FEIS submission overview. Plans for the Bernard Harbour offsetting option were briefly reviewed.
June 16, 2015	General public	Public meeting – Project update and FEIS submission overview. Plans for the Bernard Harbour offsetting option were briefly reviewed.
Kingaok and Omingmaktok		
June 15, 2015	Residents of Kingaok and Omingmaktok	Dinner and meeting on the Back River Project (re: Project update and FEIS submission overview) in Cambridge Bay, specifically for residents of Kingaok and Omingmaktok. Plans for the Bernard Harbour were briefly reviewed.
Taloyoak		
June 17, 2015	General public	Public meeting – Project update and FEIS submission overview. Plans for the Bernard Harbour offsetting option were briefly reviewed.
June 17, 2015	Hamlet of Taloyoak	Project update and FEIS submission overview. Plans for the Bernard Harbour offsetting option were briefly reviewed.
Kugaaruk		
June 16, 2015	General public	Public meeting – Project update and FEIS submission overview. Plans for Bernard Harbour were briefly reviewed.
Iqaluit		
April 14, 2015	Various community, government, and industry stakeholders participated	Sabina and Golder representatives participated in the Nunavut Mining Symposium in Iqaluit and made two presentations related to the Bernard Harbour offsetting option.
Yellowknife		
June 15, 2015	General public	Public meeting - Project update and FEIS submission overview. Plans for the Bernard Harbour offsetting option were briefly reviewed.

2.1.3 Incorporation of Traditional Knowledge (TK)

The Conceptual Fish Offsetting Plan relies on the information collected from TK (including two KIA-led TK studies), public scoping, focus group meetings, government engagement, and scientific knowledge. To the extent possible, available TK is incorporated into the offsetting plan, including existing environment and baseline summaries, mitigation and adaptive management plans, and the selection of the offsetting option to counterbalance any losses in fisheries productivity.

2.1.3.1 Environmental Assessment

The following reports were reviewed for TK specific information related to fisheries at the Project and are summarized in other sections of the FEIS:

- Inuit Traditional Knowledge of Sabina Gold & Silver Corp., Back River (Hannigayok) Project, Naonaiyaotit Traditional Knowledge Project (NTKP) (KIA 2012) (Appendix V3-3A of FEIS);
- Naonaiyaotit Traditional Knowledge Project - Hannigayok (Sabina Gold & Silver Corp. Proposed Back River Project); results from Data Gaps Workshops, Final Report (June 2014) (KIA 2014) (Appendix V3-3C of FEIS); and
- Back River Project: Existing and Publically Available Traditional Knowledge from Selected Aboriginal Groups in the Northwest Territories (Appendix V3-3B of FEIS).

2.1.3.2 Offsetting Option

The Kugluktuk HTO has been instrumental in the planning and execution of baseline studies and initial remediation studies (in cooperation with Golder), and in the planning of the remediation of the creek at Bernard Harbour (e.g., ANL and Golder 2005; Golder and ANL 2007; Golder 2013a). The Kugluktuk HTO has also played a key role in the TK study that was conducted for the Bernard Harbour Offsetting Option.

In an effort to develop a better understanding of the Arctic Char fishery in the Bernard Harbour area (and related historic and contemporary environmental conditions), a TK study was conducted in 2014 to 2015. The TK study was carried out by Sabina in partnership with the Kugluktuk HTO and was intended to complement the scientific baseline studies that have also been conducted at Bernard Harbour. The TK study involved one-on-one interviews with 11 Bernard Harbour land users from Kugluktuk and Cambridge Bay, who were selected for inclusion in the study by the Kugluktuk HTO. The TK study also made use of various secondary sources (e.g., historic records, land use reports, academic publications) and a Bernard Harbour site visit to provide additional information on the Arctic Char fishery. Results of the study provided a baseline summary of a historically-significant Arctic Char fishery for local Inuit, and ultimately, confirmation that Bernard Harbour was the preferred offsetting option for the Project.

The TK study findings are summarized in the Traditional Knowledge Study Report on the Arctic Char Fishery in the Nulahugyuk Creek – Hingittok Lake Area (Bernard Harbour), Nunavut (Appendix V3-3D of FEIS).

2.2 REGULATORY ENGAGEMENT

Sabina has regularly engaged DFO on the Project (Table 2.1-3). This has included engagement on topics such as fish offsetting requirements for the Project and, more specifically, the Bernard Harbour restoration project.

Table 2.1-3. Regulatory Engagement Activities Conducted by Sabina Regarding the Bernard Harbour Restoration Project

Date	Organization	Location	Purpose
2014			
February	Fisheries and Oceans Canada – Central and Arctic Region	Yellowknife	Introduction to the contents and structure of the Draft Environmental Impact Statement. Introduction of the Proposed Fisheries Offset Concept at Bernard Harbour
April	Fisheries and Oceans Canada – Central and Arctic Region	Yellowknife	Introduction to the Back River Project
June	Fisheries and Oceans Canada – Central and Arctic Region	Yellowknife	Update meeting and discuss attendance at the location of the proposed fisheries offset (Bernard Harbour site)
July	Fisheries and Oceans Canada – Regional Director, Ecosystems Management	Ottawa	Project status, Bernard Harbour and next steps
	Fisheries and Oceans Canada – Central and Arctic Region	Kugluktuk	Attendance at the Bernard Harbour site: along with the Kugluktuk HTO and KIA
August	Fisheries and Oceans Canada – Central and Arctic Region	Teleconference	Discussion of authorization requirements for Site Preparation Work
October	Fisheries and Oceans Canada – Central and Arctic Region	Teleconference	Further discussion of authorization requirements for Site Preparation Work
2015			
January	Fisheries and Oceans Canada – Central and Arctic Region	Teleconference	Exploring equivalency in Offsetting Policies
March	Fisheries and Oceans Canada – Central and Arctic Region	Teleconference	Discussed PHC comment responses and direction on habitat banking process. Feedback on Site Preparation proposed methodology
April	Fisheries and Oceans Canada – Central and Arctic Region	Teleconference	Discussed proposed approach to significance / residual effects assessment for FEIS
May	Fisheries and Oceans Canada – Central and Arctic Region	Teleconference	Feedback on Rascal Lake Realignment and effects assessment approach. Update on Bernard Harbour status provided. Discussed baseline work prior to freshet.
September	Fisheries and Oceans Canada – Central and Arctic Region	Teleconference	Overall project update; discussion of potential Schedule 2 implications based on predicted habitat losses
September	Fisheries and Oceans Canada – Executive Fisheries Protection	Ottawa	Project status update; discussion on Bernard Harbour direction
September	FEIS submitted to NIRB		
December	Federal Departments and Agencies	Teleconference	Review of FEIS structure
2016			
March	Fisheries and Oceans Canada – Central and Arctic Region	Teleconference	Discussed Final Submission to ensure understanding on technical issues related to fisheries. Feedback on Rascal Lake Realignment
May	Fisheries and Oceans Canada – Executive Fisheries Protection Headquarters	Ottawa	Discussed proposed approach to fisheries offset and banking
August	Fisheries and Oceans Canada – Executive Fisheries Protection Headquarters	Ottawa	Update on Bernard Harbour offsetting option.
2017			
February	Fisheries and Oceans Canada – Executive Fisheries Protection	Ottawa	Project status update; discussion on direction of Bernard Harbour offsetting option

3. Regional Setting

3.1 MARINE LAYDOWN AREA

Bathurst Inlet is a fjord that is long (approximately 165 km), narrow (2 to 15 km), and deep (greater than 300 m). This waterbody is divided into two major basins separated by a shallow sill. The outer inlet is the deeper of the two basins and contains many islands and a complex bathymetry. The inner inlet runs landward from the vicinity of Kingaok, has a relatively simple structure with few islands, and is shallower than the outer inlet, with depths between 100 and 150 m. The Western River discharges into the head of the inlet at the south, and the Mara River and Burnside River discharge into the western shoreline of the inlet. Numerous small streams discharge into the inlet along eastern and western shorelines. Bathurst Inlet cuts through the Bathurst Hills Ecoregion, which is characterized by strong relief built from massive granite rocks. The deeply indented, rocky shorelines lead to steep bathymetry with narrow nearshore areas.

Bathurst Inlet is typical of oligotrophic Arctic marine ecosystems, i.e., oxygenated throughout the water column, low in nutrients and metals, and low in phytoplankton biomass levels. Benthic invertebrates are both diverse and abundant in Bathurst Inlet, characteristics shared with other Arctic marine ecosystems. Mud and fine sediments dominate the benthic environment.

The marine fish community of Bathurst Inlet is characteristic of Arctic marine ecosystems and includes marine, anadromous, and freshwater/estuarine species. Thirteen species captured have been observed in freshwater, brackish or estuarine habitats during at least one part of their life history. Many fish species serve roles in the ecological and cultural health of the area.

Nineteen fish species are presumed to occur in waters in the immediate vicinity of the MLA in Bathurst Inlet (i.e., Local Study Area [LSA]) based on TK (KIA 2012; KIA 2014) and baseline sampling (Table 3.1-1) (also see Section 5.1.6 in Volume 7). None of the captured species are currently considered endangered, threatened, or are listed under Canada's *Species at Risk Act* (Government of Canada 2002). Fourhorn Sculpin were the most abundant species in 2001 and 2010, but were the third most abundant species in 2012. Capelin was the most abundant species in 2012, followed by Pacific Herring. Capelin were not captured on any previous sampling occasions, and their dominance in the community sampling is attributed to the date of sampling coinciding with the Capelin spawning period in 2012. During non-spawning periods, adult Capelin are generally associated with offshore habitat and are not expected to be present year-round in the nearshore areas of the LSA. Pacific Herring, Starry Flounder, Arctic Cisco, and Saffron Cod were captured in all years and on average comprised 10% or greater of the total catch.

Table 3.1-1. Fish Species Captured or Presumed to Occur in Bathurst Inlet

Common Name	Scientific Name	Primary Habitat	Depth Range
Arctic Char	*Salvelinus alpinus*	Freshwater/Anadromous	Benthopelagic
Arctic Cisco	*Coregonus autumnalis*	Freshwater/Brackish	Benthopelagic
Arctic Cod	*Boreogadus saida*	Marine	Bathypelagic
Arctic Flounder	*Pleuronectes glacialis*	Marine	Demersal
Bering Wolffish	*Anarhichas orientalis*	Marine	Demersal
Broad Whitefish	*Coregonus nasus*	Freshwater/Brackish	Benthopelagic
Capelin	*Mallotus villosus*	Marine	Pelagic
Fourhorn Sculpin	*Myoxocephalus quadricornis*	Marine/Brackish	Demersal
Lake Trout	*Salvelinus namaycush*	Freshwater/Anadromous	Benthopelagic
Least Cisco	*Coregonus sardinella*	Marine/Anadromous	Pelagic
Ninespine Stickleback	*Pungitius pungitius*	Freshwater/Estuarine	Benthopelagic
Pacific Cod	*Gadus marcocephalus*	Marine	Demersal
Pacific Herring	*Clupea pallasii*	Marine	Pelagic
Rainbow Smelt	*Osmerus mordax*	Anadromous	Pelagic
Round Whitefish	*Prosopium cylindraceum*	Freshwater/Brackish	Demersal
Saffron Cod	*Eleginus gracilis*	Marine/Brackish	Demersal
Slender Eelblenny	*Lumpenus fabricii*	Marine	Demersal
Sockeye Salmon	*Oncorhynchus nerka*	Anadromous	Pelagic
Starry Flounder	*Platichthys stellatus*	Marine/Brackish	Demersal

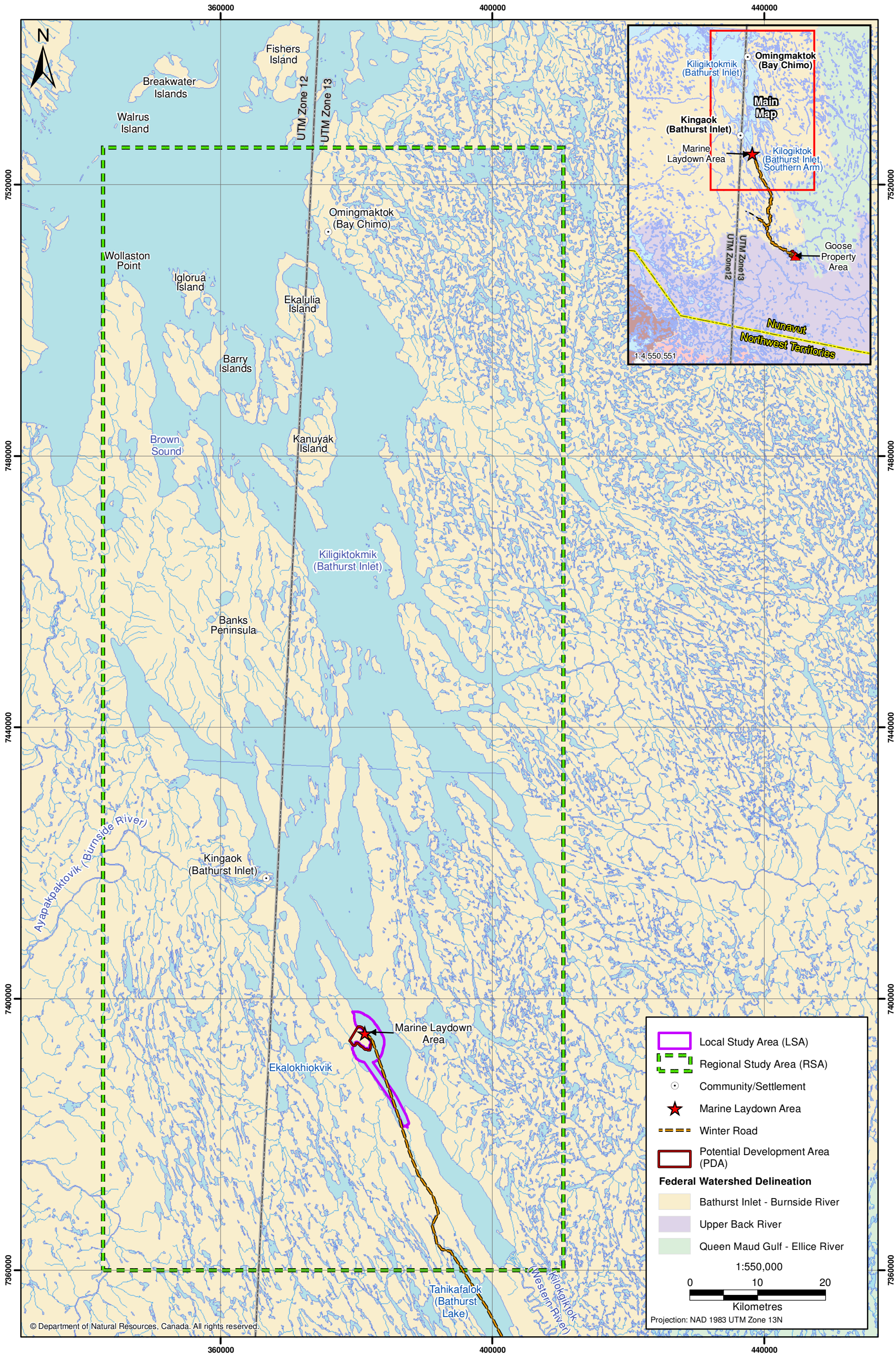
Note: Species highlighted in grey were not captured during Baseline sampling in 2010 and 2012, but they have an historic precedence of capture in Bathurst Inlet and are presumed to occur in Bathurst Inlet (reviewed in Volume 7, Chapter 5).

The community composition of fish species and the fish harvested (e.g., Arctic Char) by traditional user in the Regional Study Area reflects the influence of freshwater in the system (Figure 3.1-1). Traditional Knowledge of Arctic Char (locally known as Ekalukipik), a Valued Ecosystem Component in the environmental assessment and one of the main fish species for Ocean Inuit and Kiligiktolmiut (see Section 5.3, Volume 7, of the FEIS), was primarily discussed with reference to freshwater fishing (KIA 2012; KIA 2014). However, some coastal areas of char habitat (fishing grounds) were identified. Arctic Char occurrence was identified in the majority of rivers that flow to the ocean with the mouth of the Hiukkittak (River), the mouth of the Burnside River and the Mara River being important Arctic Char rivers for fishing.

Inuit uses of other marine fish species have also been described for tomcod (Arctic Cod or locally known as Hiughuktuk); both Arctic Char and Arctic Cod are the main fish species for Ocean Inuit and Kilikiktolmiut (KIA 2012; KIA 2014). TK information on the characteristics and uses of marine species also includes Saffron Cod, Capelin, smelt, flounder (i.e., turbot), herring, eels, wolfish, sculpin, crabs, oysters, and starfish. Arctic Cod and Saffron Cod are described as deep water, open ocean fish that are good for eating. Seasonal (summer) spawning migrations by Capelin in nearshore areas were observed and Capelin were used by drying them for eating or for dog food. Different eel species were identified in nearshore areas and considered potential food fish. Wolffish were described as strong tasting and as having thick skin. The occurrence of salmon and other unknown or new species (e.g., sharks) was also described.

GIS # BAC-06-095

August 12 2015



Sabina GOLD & SILVER CORP.

Figure 3.1-1

Local Study Area and Regional Study Area for Arctic Char

Rescan an ERM company

3.2 PROPERTY AREA

The Project is located in western Nunavut in the continuous permafrost zone of the continental Canadian Arctic. All proposed infrastructure at the Goose Property lies within the Ellis River Watershed. The Ellis River Watershed flows to the northwest, and enters the ocean on the west side of Bathurst Inlet. The Back River Watershed lies south of the proposed infrastructure in the Goose Property Area and flows to the east eventually entering the Arctic Ocean south of Gjoa Haven.

The region containing the Project is characterized by extensive networks of lakes and streams within a hummocky landscape with low elevation relief and exposed bedrock uplands. Winter is characterized by extreme cold (mean monthly temperatures -33°C), and ice cover is present on lakes between October and July. Air temperatures are highest in July, reaching a mean monthly temperature of 14°C. Regional meteorological stations report total annual precipitation between 125 mm (2009) to 344 mm (2007) for the interval 2006 to 2012 (see Volume 4, Chapter 3 for additional information). Ice depths on waterbodies are typically 1.5 to 2 metres (m) thick, and shallow waterbodies (< 1.5 m) freeze to the bottom. Hydrology in the Project area is snowmelt dominated, with peak flows occurring from early May to mid-June in most watersheds. Occasional rainfall-driven high flow events may occur between June and September.

The Goose Property is in the headwater region of its respective watersheds and has a relatively small upstream catchment. A few deep lakes provide the majority of year-round fish habitat (such as Propeller and Goose lakes), while shallow and ephemeral lakes and ponds provide seasonal habitat. Year-round habitat quality in lakes is primarily limited by depth, since overwintering by fish is only possible in lakes that do not freeze to the bottom or retain sufficient dissolved oxygen levels during ice cover. Streams in the Project area are generally small and shallow and do not provide overwintering fish habitat. Over the course of the summer, these streams tend to have low flow and low water depths. Many streams are ephemeral, flowing only during freshet, while others feature seasonal barriers such as boulder fields and seepages.

Fish distribution in the Goose Property Area is typical of inland, headwater regions of the Canadian Arctic. Lake Trout (*Salvelinus namaycush*) is the dominant freshwater fish species in the Local Study Area, followed by Round Whitefish (*Prosopium cylindraceum*), Arctic Grayling (*Thymallus arcticus*), Slimy Sculpin (*Cottus cognatus*), and Ninespine Stickleback (*Pungitius pungitius*). Other species reported in the study area include Burbot (*Lota lota*) and Lake Whitefish (*Coregonus clupeaformis*). No Arctic Char (*Salvelinus alpinus*) have been captured at the Goose Property; however, they have been captured nearer Bathurst Inlet approximately 76 km north of the Goose Property.

In the TK report (KIA 2012), the Inuit note that fish are present throughout the landscape surrounding and including the Project Area. While Goose Lake may be occasionally fished by traditional land users, they are not known to be destinations or key locations for fishing (Volume 8, Chapter 4).The TK reports also notes that freshwater fishing primarily takes place in the Back River Watershed, along the Western River, and nearby Bathurst Inlet. Lake Trout are found in lakes throughout the region; however, they are also found in rivers where large, deep pools do not freeze in winter. Whitefish and Cisco (*Coregonus artedi*) are also found in such lakes. Arctic Grayling are fished in several lakes, rivers, and streams in the Back River Watershed and along the Western River. The Inuit observe that Arctic Grayling spawn over shallow boulder fields, and that the juvenile fish are commonly found in shallow, sandy streams (KIA 2012).