Kiggavik Project Final Environmental Impact Statement

Tier 2 Volume 3: Public Engagement and Inuit Qaujimajatuqangit
Part 2: Inuit Qaujimajatuqangit

September 2014

History of Revisions

Revision Number	Date	Details of Revisions
01	December 2011	Initial release Draft Environmental Impact Statement (DEIS)
02	April 2012	Revised DEIS – to address comments received from the Nunavut Impact Review Board as part of their conformity determination released on January 18, 2012
03	September 2014	FINAL Environmental Impact Statement

Foreword

The enclosed document forms part of the Kiggavik Project Final Environmental Impact Statement (FEIS) submission, presenting potential environmental and social impacts to determine if the Project should proceed and if so, under what terms and conditions. The submission has been prepared for the Nunavut Impact Review Board by AREVA Resources Canada Inc. to fulfill the requirements of the "Guidelines for the Preparation of an Environmental Impact Statement for AREVA Resources Canada Inc.'s Kiggavik Project (NIRB File No. 09MN003)", to include new material or clarity provided during the review of the Draft Environmental Impact Statement, and to address company commitments and direction from the Nunavut Impact Review Board as outlined in the "Preliminary Hearing Conference Decision Concerning the Kiggavik Project (NIRB File No. 09MN003)".

The FEIS submission consists of a number of documents, as shown in the attached road map. These documents have been categorized into tiers, as follows:

- **Tier 1** document (Volume 1) provides a plain language summary of the Final Environmental Impact Statement.

- **Tier 2** documents (Volumes 2 to 10) contain technical information and provide the details of the assessments of potential Project environmental effects for each environmental compartment. Tier 2 Volume 11 contains executive, popular, and volume summaries in Inuktitut.

- The Tier 2 documents each have a number of technical appendices, which comprise the **Tier 3** supporting documents. These include the environmental baseline reports, design reports, modelling reports and details of other studies undertaken to support the assessments of environmental effects. Management plans are provided as Tier 3 documents.

Volume 1
Main Document

Volume 2 Project Description and Assessment Basis

- Governance and Regulatory Oversight
- Project Description
- Assessment Basis

2A Alternatives Assessment
2B Drilling and Blasting Design
2C Explosives Management Plan
2D Design of Ore and Mine Rock Pads and Ponds
2E Water Diversion and Collection Design
2F Design of Andrew Lake Dewatering Structure
2G Kiggavik-Sissons Road Report
2H Ore Storage Management Plan
2I Water Management Plan
2J Marine Transportation
2K Winter Road Report
2L All-Season Road Report
2M Roads Management Plan
2N Borrow Pits and Quarry Management Plan
2O Mine Site Airstrip Report
2P Occupational Health and Safety Plan
2Q Radiation Protection Plan
2R Preliminary Decommissioning Plan
2S Waste Management Plan
2T Environmental Management Plan
2U Hazardous Materials Management Plan
2V Mine Geotechnical Reports

Volume 3 Public Engagement and Inuit Qaujimajatuqangit

Part 1
- Public Engagement

Part 2
- Inuit Qaujimajatuqangit

3A Public Engagement Documentation
3B Inuit Qaujimajatuqngit Documentation
3C Community Involvement Plan

Volume 4 Atmospheric Environment

Part 1
- Air Quality and Climate Change

Part 2
- Noise and Vibration

4A Climate Baseline
4B Air Dispersion Assessment
4C Air Quality Monitoring Plan
4D Baker Lake Long-Term Climate Scenario
4E Noise and Vibration Assessment
4F Noise Abatement Plan

Volume 5 Aquatic Environment

- Surface Hydrology
- Hydrogeology
- Water and Sediment Quality
- Aquatic Organisms
- Fish and Fish Habitat

5A Hydrology Baseline
5B Geology and Hydrogeology Baseline
5C Aquatics Baseline
5D Groundwater Flow Model
5E Prediction of Water Inflows to Kiggavik Project Mines
5F Mine Rock Characterization and Management
5G Thermal and Water Transport Modelling for the Waste Rock Piles and Tailings Management Facilities
5H Waste Rock Water Balance
5I Hydrology of Waste Rock Piles in Cold Climates
5J Tailings Characterization and Management
5K Historical and Climate Change Water Balance
5L Kiggavik Conceptual Fisheries Offsetting Plan
5M Aquatics Effects Monitoring Plan
5N Hydrology Assessments
5O Sediment and Erosion Control Plan
5P Technical Assessments of Water Withdrawal Locations and Baker Lake Dock Site

Volume 6 Terrestrial Environment

- Terrain
- Soils
- Vegetation
- Terrestrial Wildlife

6A Surficial Geology and Terrain Baseline
6B Vegetation and Soils Baseline
6C Wildlife Baseline
6D Wildlife Mitigation and Monitoring Plan

Volume 7 Marine Environment

- Marine Water and Sediment Quality
- Marine Mammals
- Marine Fish

7A Marine Environment Baseline
7B Underwater Acoustic Modelling

Volume 8 Human Health

- Occupational Dose Assessments
- Human Health Risk Assessment

8A Ecological and Human Health Risk Assessment
8B Radiation Protection Supporting Document

Volume 9 Socio-Economic Environment and Community

Part 1
- Socio-Economic Environment

Part 2
- Heritage Resources

9A Socio-Economic Baseline
9B Archaeology Baseline
9C Human Resources Development Plan
9D Archaeological Resource Management Plan

Volume 10 Accidents, Malfunctions and Effects of the Environment on the Project

- Risk Assessments
- Effects of the Environment on the Project

10A Transportation Risk Assessment
10B Spill Contingency and Landfarm Management Plan
10C Emergency Response Plan

Volume 11 Executive, Popular and Volume Summaries Translated into Inuktitut

KEY:

Tier 1 Document	Tier 2 Document	Tier 3 Document
Main Documents	Environmental Effects Assessment Report	Technical Appendices, Baseline Reports, Technical Development and Management Plans

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Attachment

1 Introduction

1.1 Overview

The Kiggavik Project (Project) is a proposed uranium ore mining and milling operation located in the Kivalliq region of Nunavut approximately 80 kilometres (km) west of the community of Baker Lake (Figure 1.1-1). The Project is operated by AREVA Resources Canada Inc. (AREVA), in joint venture partnership with Japan-Canada Uranium Company Limited (JCU) and Daewoo International Corporation

Within the Kiggavik Project there are two general site areas referred to herein as the Kiggavik site and the Sissons site. The two sites are located approximately 17 km apart. Three uranium ore deposits will be mined at the Kiggavik site: East Zone, Centre Zone and Main Zone. A uranium mill, related facilities, main accommodations, and landing strip will also be located at the Kiggavik site. The Sissons site has two uranium ore deposits to be mined: Andrew Lake and End Grid. Open pit mining will be used to extract the ore from the three Kiggavik deposits as well as the Andrew Lake deposit. Mining of End Grid ore will require underground methods.

All ore extracted from the mine sites will be processed through the Kiggavik mill. Mined out pits at the Kiggavik site will sequentially be used as tailings management facilities (TMFs) with East Zone being the initial TMF. The uranium product will be packaged and transported via aircraft to southern transportation networks. Initially, mill reagents, fuel and other supplies will be transported by barge to Baker Lake and then by truck to the mine site over a winter access road. An all-season road between Baker Lake and the Kiggavik Site is carried through the assessment as an option proposed as a contingency in case the winter road cannot adequately support the Project over its life-span.

Decommissioning of the Project will include demolition of site facilities, clean up and reclamation of any disturbed areas, closure of the TMFs and reclamation of mine rock piles to promote vegetative growth and to provide wildlife access.

Projection: NAD 1983 UTM Zone 14N
Creator: CDC Revised: TL
Date: 9/03/2014 Scale: 1:16,000,000
File:
Data Sources: *Natural Resources Canada, Geobase®, Nation Topographic Database, Geological Survey of Canada, AREVA Resources Canada Inc.*

FIGURE 1.1-1
GENERAL LOCATION OF PROPOSED KIGGAVIK PROJECT IN CANADA

ENVIRONMENTAL IMPACT STATEMENT

Kiggavik Project

AREVA

AREVA Resources Canada Inc - P.O. Box 9204 - 817 - 45th Street West - Saskatoon, SK - S7K 3X5

The Kiggavik Project is subject to the environmental review and related licensing and permitting processes established by the Nunavut Land Claims Agreement (NLCA) (NIRB [Nunavut Impact Review Board] 2011), and to the licensing requirements of the Canadian Nuclear Safety Commission (CNSC). The Minister of Indian and Northern Affairs Canada (now Aboriginal Affairs and Northern Development Canada; AANDC) referred the Kiggavik Project to the NIRB for a Review under Part 5 of Article 12 of the NLCA in March of 2010.

The final NIRB "Guidelines for the Preparation of an Environmental Impact Statement for AREVA Resources Canada Inc.'s Kiggavik Project (NIRB File No. 09MN003)" (NIRB 2011) were issued in May of 2011. AREVA submitted the Draft Environmental Impact Statement in December 2011 and again in April 2012 with the NIRB determining that the submission successfully conformed to the EIS guidelines in May 2012. Two review periods followed with the Information Request stage completed in January 2013 and the Technical Review stage completed in May 2013. An in-person technical meeting was hosted in Rankin Inlet, Nunavut by the NIRB in May 2013 with a Community Roundtable and a Pre-Hearing Conference (PHC) hosted in Baker Lake, Nunavut shortly after in June 2013. Following the Pre-Hearing Conference the NIRB issued the "Preliminary Hearing Conference Decision Concerning the Kiggavik Project (NIRB File No. 09MN003)" in July 2013.

1.2 Nunavut Impact Review Board Guidelines for the Environmental Impact Statement and Preliminary Conference Decision

The DEIS, including this volume, was determined by the NIRB on May 4, 2012 to have adequately addressed relevant sections of the NIRB "Guidelines for the Preparation of an Environmental Impact Statement for AREVA Resources Canada Inc.'s Kiggavik Project (NIRB File No. 09MN003)" (NIRB 2011).

Greater clarity, consistency and, in some cases, additional design or assessment were provided within AREVA's responses to information requests in January 2013 and technical comments in May 2013. AREVA commitments for the preparation of the FEIS and regulatory review requirements are listed in the NIRB PHC Decision dated July 2013. Changes from the draft to final EIS including the location of information related to information requests, technical comments, and PHC requirements is noted in the Final Environmental Impact Statement (FEIS) conformity table (Tier 1, Volume 1, Technical Appendix 1A).

1.3 Purpose and Report Content

Engagement and Inuit Qaujimajatuqangit (IQ) data have been integrated throughout the entire EIS. This volume serves to present this information as a whole with the purpose to:

- meet the NIRB Guideline and Pre-Hearing Conference Decision requirements for engagement and IQ;
- document the engagement and IQ activities carried out by AREVA Resources Canada Inc. (AREVA) from February 2005 until July 2014 associated with the Kiggavik Project;
- Provide information on the methodology and process used by AREVA to collect and integrate IQ; and
- provide information on the existing traditional knowledge or IQ relevant to the Kiggavik Project.

Although IQ and engagement are distinct and one does not replace the need for the other, the holistic nature of IQ leads to the complementary nature of IQ and engagement efforts and data and some overlap. Both are presented in this volume but because company efforts were specific to the collection of each IQ and engagement data, they are presented separately: Engagement in Volume 3, Part 1 and IQ in Volume 3, Part 2 as outlined at the end of this section.

Meaning of Inuit Qaujimajatuqangit

The term Inuit Qaujimajatuqangit is used to describe Inuit epistemology or the Indigenous knowledge of the Inuit (Tagalik 2012). Inuit Qaujimajatuqangit translates into English as “that which Inuit have always known to be true.” Because IQ encompasses all knowledge and many things in Inuit culture, the Government of Nunavut Department of Culture, Language, Elders, and Youth acknowledged that it is difficult to define it all in just one word (Government of Nunavut 1999).

Inuit Qaujimajatuqangit, from its inception, was intended to include not only Inuit traditional knowledge, but also the contemporary values of Nunavut's communities (Arnakak 2002). The Government of Nunavut’s Department of Sustainable Development's IQ Working Group defined IQ as: the past, present and future knowledge, experience and values of Inuit society (Arnakak 2002).

A vivid analogy to describe the continuum of IQ from past to present and future is provided in Tagalik (2012):

Inuit Elders have used the bow and arrow analogy to explain the relevance this life view, established over centuries, has for the future of Inuit. They say that if you do not draw back the arrow in the bow, it will drop a short distance in front of you. In other words, the level of our understanding of the views and values of our past helps determine the degree of success we have with our future; the better our understanding, the greater our success. This conceptually iterative approach of past informing present and future is a critical underpinning of Inuit worldview (Pauktuutit, 2006).

The holistic nature of IQ is evident in the definition of Inuit Qaujimajatuqangit provided by the Qikiqtani Inuit Association (QIA 2009) and used by the NIRB in the glossary of the Kiggavik DEIS guidelines (NIRB 2011): "the traditional, current and evolving body of Inuit values, beliefs, experience, perceptions and knowledge regarding the environment, including land, water, wildlife and people, to the extent that people are part of the environment." Similarly, Inuit Qaujimajatuqangit is defined in the Nunavut Wildlife Act as "traditional Inuit values, knowledge, behaviour, perceptions and expectations."

Meaning of Inuit Qaujimajatuqangit - Gathered by AREVA

Inuit Qaujimajatuqangit is designed to provide cultural grounding and a sense of purpose with responsibilities set out in principled approaches (Tagalik 2012). Elders describe IQ as the wisdom gained from extensive experience that has been passed from generation to generation (Nunavut Tunngavik Incorporated 2000b). It is noted by some that the knowledge of younger people demonstrates ongoing and accurate transmission of this knowledge from the older generation to the younger generation (Collignon 2006, in Hughson 2010).

In order to supplement existing information available on the definition and meaning of IQ, AREVA held a focus group meeting in Baker Lake to ask Elders the questions: what is IQ and who are the holders of IQ (IQ-BL EL Sep 2013)?

The group acknowledged that IQ includes both Inuit traditional ecological land use knowledge as well as social values, social norms, governance, and guiding principles. Examples of Inuit traditional knowledge passed down from generation to generation (IQ-BL EL Sep 2013[1]) include: how to navigate using snowdrifts (IQ-BL EL Sep 2013[2]), caribou hunting techniques (IQ-BL EL Sep 2013[3], IQ-BL EL Sep 2013[4]), how to skin and butcher caribou (IQ-BL EL Sep 2013[5]), the importance of using all parts of an animal (IQ-BL EL Sep 2013[6]), and the importance of understanding caribou clothing (IQ-BL EL Sep 2013[7]).

[1] IQ-BL EL Sep 2013: *IQ has been here for generations, passed on from family and camp members*

[2] IQ-BL EL Sep 2013: *Snowdrifts (qimugjuit) are important for navigation*

[3] IQ-BL EL Sep 2013: *He was taught to not go after first group of caribou during migration*

[4] IQ-BL EL Sep 2013: *Not allowed to hunt at dusk or in dark as this is not safe and not good good for caribou.*

[5] IQ-BL EL Sep 2013: *Skinning caribou and butchering properly are important skills. There are different ways of skinning different caribou and seasons. This needs to be learned.*

[6] IQ-BL EL Sep 2013: *Make sure to utilize all parts of an animal when your husband catches it.*

[7] IQ-BL EL Sep 2013: *Elder was taught about how to maintain caribou clothing in relation to weather and seasons*

Baker Lake Elders identified many social aspects of IQ such as: work responsibilities (IQ-BL EL Sep 20138), governance (IQ-BL EL Sep 20139), mutual respect (IQ-BL EL Sep 201310), importance of family and community (IQ-BL EL Sep 2013[11]), maintaining harmony (IQ-BL EL Sep 2013[12]), and working together for a common goal (IQ-BL EL Sep 2013[13], IQ-BL EL Sep 2013[14]). One Elder noted that *we should be in awe at our ancestors - the instinct for survival is strong and has carried Inuit for generations; even though we are in an extremely cold and harsh environment, Inuit have prevailed* (IQ-BL EL Sep 2013).

In terms of who holds IQ, the Baker Lake Elders noted that there is such a large amount of knowledge it cannot be held by one person (IQ-BL EL Sep 2013[15,16]) and that *we can never be sure exactly what was said by our ancestors about IQ* (IQ-BL EL Sep 2013). Elders also noted that *colonization had a huge effect on Inuit; their laws and education were altered* (IQ-BL EL Sep 2013) and that *IQ needs to be strengthened and supported* (IQ-BL EL Sep 2013). Changes in IQ over time were also discussed (IQ-BL EL Sep 2013[17,18,19,20]).

The feedback from Baker Lake Elders on the meaning of IQ describes a number of the guiding principles and the concept that IQ is past, present and future. Inuit Qaujimajatuqangit is passed on by Elders to the younger generations. This is done through hands on teaching, demonstrations and stories. Elders are an extremely important element in the knowledge transfer. This knowledge was gained through experiences and teachings from Elders they knew. Inuit have also gained knowledge through trial and error and this is recognized as a very important way to gain knowledge. Experience is a vital component to learning and Elders tell of many mistakes they have made or have heard of that contribute to their teachings.

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[8] IQ-BL EL Sep 2013: *When you marry, make sure to maintain your husband's clothing at all times. Especially your husband's mitts and kamiit as weather can change drastically anytime.*

[9] IQ-BL EL Sep 2013: *Inuit carried on as a society before institutions such as government/RCMP were around.*

[10] IQ-BL EL Sep 2013: *Words are extremely powerful. Always be careful with what you say and about who. These words can come back to you.*

[11] IQ-BL EL Sep 2013: *IQ is about looking after family and others in a community*

[12] IQ-BL EL Sep 2013: *Everyone must listen to parents. If you didn't listen, then an Elder may intervene to deal with behaviour.*

[13] IQ-BL EL Sep 2013: *Inuit have also been a self-regulating society, including knowledge to conserve wildlife such as caribou*

[14] IQ-BL-EL Sep 2013: *Mother taught her to not be idle and not just wander around. Young women must contribute to camp and family and help others.*

[15] IQ-BL EL Sep 2013: *IQ is a massive amount of knowledge that not only one person can carry alone. That job would be too overwhelming.*

[16] IQ-BL EL Sep 2013: *Elders were holders of IQ although Elders, even now, may miss some IQ values.*

[17] IQ-BL EL Sep 2013: *Times and conditions change. Change happens in cultures and people.*

[18] IQ-BL EL Sep 2013: *Some Inuit have lost IQ due to lack of communication with others and Elders*

[19] IQ-BL EL Sep 2013: *Some IQ not used as much these days e.g. arranged marriages*

[20] IQ-BL EL Sep 2013: *Christianity has altered some IQ values and has enlightened many lives*

Inuit Qaujimajatuqangit Guiding Principles

The definitions of IQ help describe the broad meaning of the word and guide the use and integration of IQ throughout this environmental assessment. A deeper understanding of the meaning of IQ is provided through examination of IQ guiding principles.

Inuit Elders in Nunavut have identified a framework for IQ which is based in four main laws or maligait (GN 2007). Implementation of these fours maligait contribute towards 'living a good life' (Tagalik 2012). The four maligait are:

1. Working for the common good
2. Respecting all living things
3. Maintaining harmony and balance and
4. Continually planning and preparing for the future

In 2001, Nunavut Elders identified six guiding principles as a plan for the continuous application of IQ in Inuit Society (Nunavut Tunngavik Incorporated 2000a). These six guiding principles are:

1. Pijitsirniq: the concept of serving
2. Aajiiqatigiingniq: the concept of consensus decision-making
3. Pilimmaksarniq: the concept of skills and knowledge acquisition
4. Piliriqatigiingniq: the concept of collaborative relationships or working together for a common purpose
5. Avatimik Kamattiarniq: concept of environmental stewardship
6. Qanuqtuurnunnarniq: concept of being resourceful to solve problems

The Government of Nunavut (GN 2009) subsequently added two more guiding principles:

1. Inuuqatigiitsiarniq: respecting others, relationships, and caring for people
2. Tunnganarniq: fostering good spirit by being open, welcoming, and inclusive

These eight guiding principles are the framework adopted by the Nunavut Impact Review Board (NIRB). Within its documents and decisions, when the NIRB refers to traditional knowledge and Inuit Qaujimajatuqangit, it is meant to encompass local and community based knowledge, ecological knowledge (both traditional and contemporary), which is rooted in the daily life of Inuit people, and has an important contribution to make to an environmental assessment. The NIRB requires project proponents to not only incorporate traditional knowledge into the baseline collection and methodologies of resource management, but further outline where management strategies, mitigation and monitoring plans, and/or operational considerations employ values of Inuit Qaujimajatuqangit (http://www.nirb.ca/inuit-qaujimajatuqangit).

IQ principles are tailored and focused for inclusion in a number of Acts and government initiatives (GN 2013). For example, the IQ principles in the Nunavut Wildlife Act are provided here:

- Pijitsirniq/Ihumaliukti, which means that a person with the power to make decisions must exercise that power to serve the people to whom he or she is responsible;
- Papattiniq/Munakhinik, which means the obligation of guardianship or stewardship that a person may owe in relation to something that does not belong to the person;
- Aajiiqatigiingniq/Pitiakatigiiklotik, which means that people who wish to resolve important matters or any differences of interest must treat each other with respect and discuss them in a meaningful way, keeping in mind that just because a person is silent does not necessarily mean he or she agrees;
- Pilimmaksarniq/Ayoikyumikatakhimanik, which means that skills must be improved and maintained through experience and practice;
- Piliriqatigiingniq/Havakatigiiklutik, which means that people must work together in harmony to achieve a common purpose;
- Avatimik Kamattiarniq/Amiginik Avatimik, which means that people are stewards of the environment and must treat all of nature holistically and with respect, because humans, wildlife and habitat are inter-connected and each person's actions and intentions towards everything else have consequences, for good or ill;
- Qanuqtuurunnarniq/Kaujimatukanut , which means the ability to be creative and flexible and to improvise with whatever is at hand to achieve a purpose or solve a problem;
- Qaujimanilik/Ihumatuyuk, which means a person who is recognized by the community as having in-depth knowledge of a subject;
- Surattittailimaniq/Hugattittailimanik, also called Iksinnaittailimaniq/Ikhinnaittailimanik, which means that hunters should hunt only what is necessary for their needs and not waste the wildlife they hunt;
- Iliijaqsuittailiniq/Kimaitailinik, which means that, even though wild animals are harvested for food and other purposes, malice towards them is prohibited;
- Sirliqsaaqtittittailiniq/Naklihaaktitihuiluhi, which means that hunters should avoid causing wild animals unnecessary suffering when harvesting them;
- Akiraqtuutijariaqanginniq Nirjutiit Pijjutigillugit/Hangiaguikluhi Nekyutit InuupPiutigingitait, which means that wildlife and habitat are not possessions and so hunters should avoid disputes over the wildlife they harvest or the areas in which they harvest them; and
- Ikpigusuttiarniq Nirjutilimaanik/Pitiaklugit nekyutit, which means that all wildlife should be treated respectfully.

IQ is holistic and reflects individual and collective experiences both past and present. Integration of IQ is not specific to environmental assessment and numerous initiatives are being undertaken to provide guidance for the integration of IQ into business, education and training, government decision-making and other aspects of Nunavut development (e.g. GN Department of Economic Development and Transportation has established an Inuit Qaujimajatuqangita Isumaksaqsiurtingit committee to help implement IQ in the workplace and provide advice on how IQ can be reflected in programs, services, legislation and regulations). Improvements in the integration of IQ realized

through the various initiatives are likely to result in and influence advances in other related efforts at integration.

Influence of Inuit Qaujimajatuqangit on AREVA's Work

Knowledge and understanding of IQ and Inuit culture influences the way in which AREVA conducts business in Nunavut. Many of the IQ principles described above can be seen in AREVA efforts to:

- engage various groups (e.g. elders, youth, hunters, local businesses and others) within communities as all groups are recognized as valued contributors.
  - Tunnganarniq, Aajiiqatigiingniq, Inuuqatigiitsiarniq
- remove language barriers through use of translated material and availability of translators at meetings
  - Pilimmaksarniq, Tunnganarniq
- prioritization of face-to-face meetings to create relationships but use of various other communication mediums to provide information and obtain feedback
  - Inuuqatigiitsiarniq, Tunnganarniq, Piliriqatigiingniq
- better understand local priorities and preferences and demonstrate this understanding by integrating what we have heard and learnt into the EIS
  - Pilimmaksarniq, Avatimik Kamattiarniq, Inuuqatigiitsiarniq
- hire locally and plan to provide on-the-job training
  - Piliriqatigiingniq, Inuuqatigiitsiarniq, Tunnganarniq, Qanuqtuurnunnarniq, Pilimmaksarniq
- work with local educational institutions in the community to assist pre-employment training
  - Qanuqtuurnunnarniq, Pilimmaksarniq
- Incorporating IQ principles into mitigation, monitoring, and management plans
  - Qanuqtuurnunnarniq, Avatimik Kamattiarniq, Pilimmaksarniq
- participating as a member of the community through sponsorships
  - Pijitsirniq, Piliriqatigiingniq

The IQ studies presented in this volume were undertaken to collect information primarily on contemporary and traditional ecological knowledge. The IQ documented in this report therefore relates to traditional activities or land use and understanding of wildlife and their habitat. IQ relating to socio-economic issues is documented in the Socio-Economic Baseline (Appendix 9A) A full discussion on Inuit use of the land is documented in the Main Document (Technical Appendix 1F).

IQ data gathered by AREVA will be provided to the Kivalliq Inuit Association (KIA) and Nunavut Tunngavik Incorporated (NTI). AREVA is honoured to be able to contribute to larger IQ storage initiatives.

This report is organized as follows:

Part 1 - Engagement

- Part 1 Section 1 describes the background and purpose of the document
- Part 1 Section 2 provides a project overview and assessment basis
- Part 1 Section 3 describes the engagement approach, strategy and efforts carried out from 2006 to 2011.
- Part 1 Section 4 presents the main findings of public engagement activities.
- Part 1 Section 5 describes how community engagement information was used and how it was integrated into the DEIS.

Part 2 – Inuit Qaujimajatuqangit

- Part 2 Section 2 provides a project overview
- Part 2 Section 3 describes the methodology.
- Part 2 Section 4 describes the results of the study for each of the Kivalliq communities.
- Part 2 Section 5 presents a summary of the key findings of this report.
- Part 2 Section 6 presents the references and interviews cited in this report.

2 Project Overview

Location	• Kivalliq Region of Nunavut, approximately 80 km west of Baker Lake. • The Project includes two sites: Kiggavik and Sissons (collectively called the Kiggavik Project). • The Kiggavik site is located at approximately 64°26'36.14"N and 97°38'16.27"W. • The Sissons site is located approximately 17 km southwest of Kiggavik at 64°20'17.61"N and 97°53'14.03"W. • The Kiggavik and Sissons sites are composed of 37 mineral leases, covering 45,639 acres.
Resources	• The total quantity of resources is currently estimated at approximately 51,000 tonnes uranium (133 million lbs U3O8) at an average grade of 0.46% uranium.
Life of Mine	• Approximately 12 years of operation, based on studies to date. It is anticipated that pre-operational construction will require 3 years while remaining post-operational decommissioning activities will require 5 years. • Under favourable market conditions, construction of the Project could begin as early as 2017.
Mining	• There are five individual mines proposed for the Project: East Zone, Center Zone and Main Zone at the Kiggavik site; End Grid and Andrew Lake at the Sissons site. • The three Kiggavik deposits and the Andrew Lake deposit will be mined by truck-shovel open pit, while End Grid will be an underground mine.
Mine Rock	• Mine rock will be segregated into material suitable for use in construction (Type 1), non-acid generating (Type 2), and potentially problematic material (Type 3). • Type 2 and Type 3 rock will be managed in surface stockpiles during operation. • Upon completion of mining, Type 3 mine rock will be backfilled into mined-out pits.
Mill	• The ore will be processed in a mill at the Kiggavik site to produce approximately 3,800 tonnes uranium (9.9 million lbs U3O8) per year as a uranium concentrate, commonly referred to as yellowcake.
Tailings	• The mill tailings will be managed at in-pit tailings management facilities constructed using the mined-out East Zone, Centre Zone and Main Zone open pits at the Kiggavik site. • Administrative and action levels will be used to control and optimize tailings preparation performance for key parameters.
Water Management	• A purpose-built-pit will be constructed at the Kiggavik site to optimize water management, storage, and recycling. • All mill effluent, tailings reclaim, and site drainage will be treated prior to discharge to meet the Metals Mining Effluent Regulations and site-specific derived effluent release targets. • Administrative and action levels will be used to control and optimize water treatment plant performance for key elements.
Site Infrastructure	• Power will be supplied by on-site diesel generators. • The operation will be fly-in/fly-out on a 7 to 14 day schedule with on-site employees housed in a permanent accommodations complex.

Access	• Access to the site will be provided by either a winter or all-season road between Baker Lake and Kiggavik. Supplies will be shipped to a dock facility at Baker Lake during the summer barge season and trucked to Kiggavik via the road. • An airstrip will be constructed and operated at site for transportation of personnel and yellowcake.
Environment	• Site-specific environmental studies have been on-going since 2007 • Public engagement and collection of Inuit Qaujimajatuqangit has been on-going since 2006; this information is integrated into the environmental effects assessment reports • AREVA's approach has been to integrate environmental assessment and decommissioning requirements into the Project design cycle to enhance mitigation of effects by design and to support the development of management, mitigation, and contingency plans to protect the environment
Benefits	• AREVA is negotiating an Inuit Impact Benefit Agreement with the Kivalliq Inuit Association • The total taxes and royalties to be paid on the Kiggavik project would be approximately $1 billion, payable to Nunavut Tunngavik Inc., Government of Nunavut, and Government of Canada. • The Project is expected to employ up to 750 people during construction and 400-600 people during operation.

3 Methodology

3.1 Research Licence

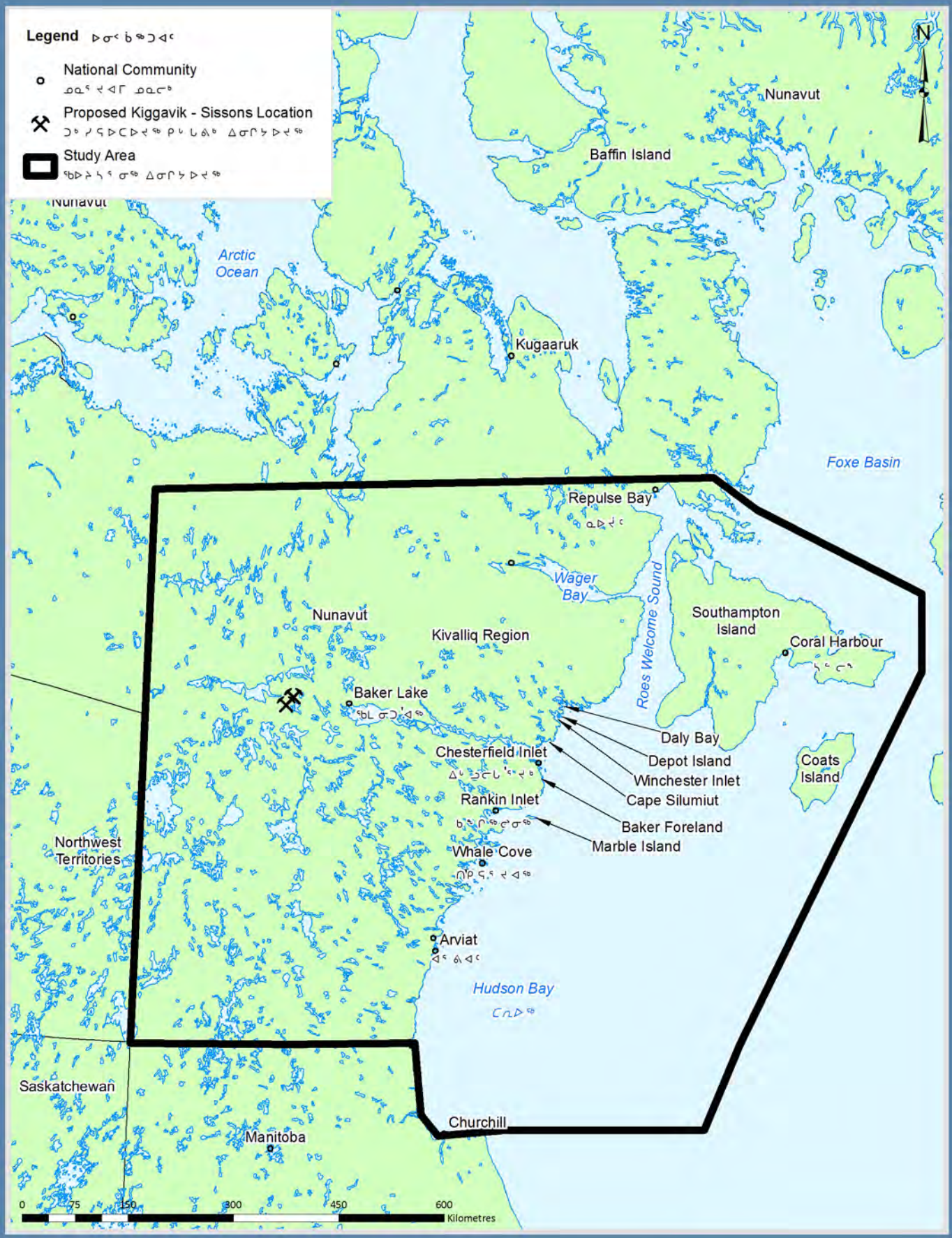
A Scientific Research Licence is required to conduct social research in Nunavut. The Nunavut Research Institute (NRI) is responsible for administering Scientific Research Licences. In May, 2008, Golder Associates Ltd. (Golder) applied to the NRI for a licence to conduct Social Science and Traditional Knowledge research for the Project. Research Licence 0300209R-M was issued in July 2008 to conduct "Socio-Economic and Traditional Knowledge Studies in Relation to the Kiggavik Project Environmental Impact Assessment, Kivalliq Region." The licence provided for conducting key informant interviews and focus group discussions in all seven communities of the Kivalliq Region. The short term use of the data was to prepare Socio-economic and Traditional Knowledge baseline studies which will be used to assess the potential for Project impacts, frame mitigation or enhancement measures in response to those impacts, and provide a baseline for monitoring programs. Because environmental impact assessments are public documents, one of the terms of the licence was that the names of study participants not be mentioned in the study reports. Other terms of the licence included provisions for informed consent, and for community review.

3.2 Study Area

Figure 3.2-1 shows the IQ study area. The study area is in the Kivalliq Region and includes the following seven communities:

- Baker Lake;
- Chesterfield Inlet;
- Rankin Inlet;
- Arviat;
- Whale Cove;
- Repulse Bay; and
- Coral Harbour.

The study area was chosen because it encompasses all main project activites anticipated for the Project and the seven communities of the region represented by the KIA. IQ solicited was broad and participants were encouraged to share information associated with any location in the Kivalliq Region. Interview participants shared traditional ecological knowledge, land use and other IQ information from the Kivalliq Region, with the opportunity to share their knowledge of the area around the Kiggavik Project site including access road option corridors, the proposed dock site, and the area around Pitz, Aberdeen and Princess Mary lakes.



Projection: NAD 1983 UTM Zone 14N
Creator: MGD/MK
Date: 18/08/2011 Scale: 1:7,500,000
File: KI08A214
Data Sources: *ESRI Canada Data*
Atlas of Canada Data

FIGURE 3.2-1
INUIT QAUJIMAJATUQANGIT STUDY AREA

KIGGAVIK PROJECT - EIS

Golder Associates
AREVA

AREVA Resources Canada Inc - P.O. Box 9204 - 817 - 45th Street West - Saskatoon, SK - S7K 3X5

3.3 Information Sources

Supplemental information to AREVA collected IQ baseline came from a combination of literature review and field studies. An annotated bibliography of the above sources is found in Attachment A of Tier 3 Techncial Appendix 3B IQ Documentation. The literature review included the following previous studies:

Bennett, John and Susan Rowley 2004 (Compiled and Edited). Uqalurait: An Oral History of Nunavut. McGill's-Queen's University Press, Montreal and Kingston.

Cumberland (Cumberland Resources Inc.). 2005. Meadowbank Gold Project: Baseline Traditional Knowledge Report. Prepared for Agnico Eagle Ltd. January 2005.

Freeman, Milton M.R. (General Editor) 1976. Inuit Land Use and Occupancy Project, Volume 1-3. INA Publication No. QS 8054-001-EE-A1. Thorn Press Limited.

GeoVector Management Inc. 2008. Thelon and Kazan Rivers Background Study, Management Planning Assessment, Final. Prepared for the Kivalliq Inuit Association.

Kendrick, Anne and Micheline Manseau. 2008. Representing Traditional Knowledge: Resource Management and Inuit Knowledge of Barren-Ground Caribou. Society and Natural Resources 21: 404-418, Routledge Taylor and Francis Group.

Laidler, Gita J and William A. Gough 2003. Climate Variability and Climatic Change: Potential Implications for Hudson Bay Coastal Communities. Polar Geography, 27, No. 1 pp. 38-58.

Mannik, Hattie (volume editor). 1998. Inuit Nunamiut: Inland Inuit. Friesen Corporation, Altona, Manitoba.

McDonald, Miriam, Lucassie Arragutainaq, and Zack Novalinga. 1997. Voices from the Bay: Traditional Ecological Knowledge of Inuit and Cree in the Hudson Bay Bioregion. Canadian Arctic Resources Committee, Environmental Committee of Municipality of Sanikiluaq, Ottawa Ontario.

Riewe, Rick (Editor). 1992. Nunavut Atlas. Canadian Circumpolar Institute and the Tungavik Federation of Nunavut.

3.4 Field Studies

Field studies for the Project generally include initial interviews conducted in Baker Lake by Hattie Mannik in 2008, as well as a combination of interviews and focus group discussions conducted by consultants from Golder Associates, Ltd. (Golder) in 2009 in each of the seven Kivalliq communities: Baker Lake, Chesterfield Inlet, Rankin Inlet, Arviat, Whale Cove, Repulse Bay and Coral Harbour. Field studies also include the 2011 community review meetings undertaken by Golder and AREVA representatives, which were held to verify the accuracy of data-recording from the previous meetings and to provide the opportunity to add additional IQ information related to the Project area and the potentially-affected communities in the Kivalliq region. During interviews, participants were always able to communicate in either English or Inuktitut. Some individuals held knowledge from different focus groups and may have attended more than one meeting. For example, an Elder who is also a hunter and member of the Hunter and Trappers Organization (HTO) could attend two meetings and provide input twice. In 2014, meetings were held in Baker Lake and Chesterfield Inlet to discuss the similarities and differences between consultant, Inuit and other sources of information as well as to provide another opportunity to add additional IQ information. IQ was primarily gathered in report or interview form (text) and maps were also used, almost exclusively in latter validation meetings, to record IQ data. The following sections describe the initial studies in 2008, the 2009 field studies, the review meetings in 2011 and the 2014 meetings held in Baker Lake and Chesterfield Inlet.

3.4.1 Initial Studies in 2008

Between January 2007, and September 2008, AREVA representatives and the Community Relations Committees (CLCs) discussed IQ for the proposed baseline studies for the Project. Members of the Baker Lake CLC recommended and supported using Hattie Mannik, a Baker Lake resident and researcher to interview Baker Lake Elders. In 2008, Hattie Mannik conducted 18 individual interviews with Baker Lake Elders. The interview topics related to locations of ancestral habitation, caribou caching, fishing, archaeological and culturally important sites, moving to Baker Lake, and various aspects of the proposed Project. A summary of the 2008 Baker Lake interviews and the questionnaire that was used for the interviews are found in Attachment B of Appendix 3B IQ Documentation. The questions generally focused on place where people lived in the general region of Kiggavik, Judge Sissons Lake and Baker Lake; the types of food sources people use; meat caching areas; fishing areas; graves and other culturally important areas; and the potential effects of a bridge over the Thelon River, a dock at Huqlik Island, and a winter road to Kiggavik.

Subsequent to the 2008 interviews undertaken by Hattie Mannik, AREVA retained Golder to review the results of the interviews and to assist with additional IQ collection in Baker Lake, and other communities in Kivalliq Region.

3.4.2 Field Studies in 2009

Subsequent to reviewing the results of the Baker Lake interviews conducted by Hattie Mannik in 2008, Golder representatives participated at a meeting in Rankin Inlet with the Regional Liaison Committee (RLC) and AREVA in February 2009. There was a discussion about collecting additional IQ information in Baker Lake, and undertaking IQ studies in Chesterfield Inlet, Rankin Inlet, Whale Cove, Arviat, Repulse Bay, and Coral Harbour. During the discussions, the RLC indicated they believe the Project is important to all the Kivalliq communities, recommended the names of members in each of the communities that would assist with arranging the interviews and focus groups.

Baker Lake Focus Groups

After reviewing the results of the Elder interviews done by Hattie Mannik in 2008, Golder arranged focus groups in Baker Lake with Elders and younger adult hunters. The purpose of the focus groups was to gather additional information from the Elders participating in the 2008 interviews on topics such as the following:

- Changes to caribou migration patterns (when questioning, did not specify timeframe to describe changes);
- Caribou health and changes in quality of meat;
- Changes in fish quality and water bodies associated with changes in fish quality;
- Water quality in lakes and rivers; and
- Use of vegetation; and
- Other topics identified as important to the Project by the Elders.

In addition to holding a focus group with the Elders to gather additional information, a focus group was held with younger adult hunters to collect information on the above topics and on information generally related to important wildlife habitats and harvesting areas, culturally important areas, The focus groups held with the Elders and younger adult hunters used a semi-structured methodology during which the participants were engaged in a conversation and asked questions about the environment, traditional activities, and perceptions about the potential effects of the Project. This format was used so that participants could focus on their particular areas of knowledge and have the opportunity to provide additional information they believed to be important. The focus group with the Elders was guided by the topics identified above, and the focus group with younger adult hunters was guided the following topics:

- Land and marine mammals (including harvesting areas, animal health, important habitats);
- Game birds (harvesting areas, animal health, important habitats);
- Fish (including species, harvesting, fish health, spawning areas);
- New wildlife species observed;
- Culturally important areas or sites (e.g., cabins, burial sites);

- Observed changes in weather patterns;
- Observed changes in water quality or quantity; and
- Potential effects of the Project.

Table 3.4-1 below shows the composition of the focus groups held with the Elders and hunters in Baker Lake. Of the 2009 Elders' focus group, seven had participated in the 2008 interviews. Hattie Mannik helped to facilitate the Elders' focus group and the maps from the 2008 interviews were reviewed and used as a reference for identifying additional information. The focus group held with hunters also reviewed the maps from the 2008 interviews, as some of the participants had participated in those interviews. Socio-economic studies were also being conducted at the same time in Baker Lake by Golder representatives. Because there was some overlap in the subject matter between the socio-ec studies and the IQ related to ecological knowledge, the focus groups were co-led by Golder's traditional studies specialist and socio-economic specialist. While the focus groups with Elders, and younger hunters focused on the topics identified above, the socio-economic specialist would raise additional topics related to the socio-economic aspects of the information under discussion.

Chesterfield Inlet Interviews and Focus Groups

Because the community of Chesterfield Inlet is situated close to the Project's marine transportation corridor, this community, along with Baker Lake, has more potential for Project related effects than the other five communities in the Kivalliq region (See Volume 3 Part 1 for full discussion on potentially affected communities). Thus, the field studies in Chesterfield Inlet conducted by Golder were organised to match the methodology used in Baker Lake, consisting of a combination of interviews and focus group discussions.

On May 6 and 7, 2009, interviews were conducted with nine Elders and one adult hunter (total of two women, eight men. Semi-structured interviews were used, during which the participants were engaged in a conversation and asked questions about the environment, traditional activities, and perceptions about the potential effects of the Project. This format was used so that participants could focus on their particular areas of knowledge and have the opportunity to provide additional information they believed to be important. The topics that guided the interviews included:

- Land and marine mammals (including harvesting areas, animal health, important habitats, migration routes);
- Game birds (harvesting areas, animal health, important habitats);
- Fish (including species, harvesting, fish health, spawning areas);
- Traditional use of vegetation;
- New wildlife species observed;
- Culturally important areas or sites (e.g., cabins, burial sites);
- Observed changes in weather patterns;

- Observed changes in water quality or quantity; and
- Potential effects of the Project on wildlife or traditional activities

Interviews were audio recorded and notes were taken. Information was also recorded on maps provided at various scales. Subsequent to the interviews, notes and recordings were reviewed and mapped information was aggregated to show information at the community level. A summary of the interviews conducted in Chesterfield Inlet is found in Attachment C of Appendix 3B IQ Documentation.

A focus group was also held in Chesterfield inlet with Elders and the HTO. The dates and composition of the focus groups are found in Table 3.4-1 below. The focus groups were held to identify additional information related to the above topics, and to collect IQ related to socio-economic issues, such as country foods, and transfer of hunting skills to young people. During the focus group discussions, participants had the opportunity to record information on various maps showing the region and the immediate Project area. A summary of the focus group results as they relate to the natural environment and traditional use of resources is found in Attachment C. A discussion of the role of focus groups in collecting IQ for the socio-economic studies is found in the Socio-Economic Baseline (Technical Appendix 9A).

Table 3.4-1 Composition of Elder, Hunter, and HTO Focus Groups in Baker Lake and Chesterfield Inlet

Group	Date	Composition
Baker Lake Hunters	March 4, 2009	3 women, 6 men
Baker Lake Elders	March 5, 2009	5 women, 2 men
Chesterfield Inlet HTO	May 7, 2009	4 women, 4 men
Chesterfield Inlet Elders	May 8, 2009	2 women, 4 men

Focus Groups in Rankin Inlet, Whale Cove, Arviat, Repulse Bay, and Coral Harbour

The literature review suggested that the traditional harvesting areas of Arviat, Whale Cove, and Rankin Inlet were becoming more localized (Freeman 1976, Volume 1), and that the harvesting areas of Repulse Bay and Coral Harbour were considerably north of Chesterfield Inlet (Freeman 1976, Vol. 1, Vol. 3). Based upon the information above and the distance that Repulse Bay and Coral Harbour are from the Project, a revised methodology was used to collect IQ related to the environment and traditional activities. Focus groups based upon the socio-economic baseline studies were used to collect information in Rankin Inlet, Whale Cove, Arviat, Repulse Bay and Coral Harbour. The following topics related to the environment and traditional activities were included in the focus group discussions the five communities:

- Wildlife and traditional activities (including hunting, trapping, fishing, use of vegetation);
- Changes in traditional activities;
- Terrestrial and marine mammals (important species, health, changes in distribution);
- Changes in weather patterns; and
- Potential effects of the Project on traditional activities or the environment.

During the focus groups, participants were shown maps at various scales, and had the opportunity to provide information on traditional activities or wildlife knowledge in the Baker Lake and Chesterfield Inlet region.

Table 3.4-2 shows the dates and composition of the IQ focus groups held with Elders, hunters, and HTO members in Arviat, Whale Cove, Rankin Inlet, Repulse Bay, and Coral Harbour.

Table 3.4-2 Dates and Composition of IQ Focus Groups in Arviat, Whale Cove, Rankin Inlet, Repulse Bay, and Coral Harbour

Group	Date	Composition
Arviat HTO	March 30, 2009	1 woman, 6 men
Arviat Elders	March 31, 2009	6 women, 3 men
Whale Cove HTO	Not able to organize	
Whale Cove Elders	April 9, 2009	3 men
Rankin Inlet HTO	April 2, 2009	5 men
Rankin Inlet Elders	April 3, 2009	1 woman, 3 men
Repulse Bay HTO	May 11, 2009	1 woman, 5 men
Repulse Bay Elders	May 11, 2009	2 women, 3 men
Coral Harbour Hunters	May 13, 2009	1 woman, 5 men
Coral Harbour Elders	May 14, 2009	4 women, 1 man

3.4.3 2011 Community Review Meetings

Subsequent to the completion of interviews in Kivalliq Region in 2009, the results of the interviews and focus groups in Baker Lake and Chesterfield (including maps) were prepared, and in January, 2010, copies of the reports and maps were sent to Hattie Mannik in Baker Lake, and Andre Tautu in Chesterfield inlet. The information was made available to those who had participated in the studies and other interested members of the community. In November, 2010, representatives of AREVA visited each of the Kivalliq communities and presented the maps of the IQ information collected in each of the communities. At that time, AREVA indicated that subsequent meetings would be

arranged to discuss the results of the IQ information and provide an opportunity to provide additional information.

In February and March of 2011, community review meetings were held with community members to review the IQ data collected at the previous meetings and interviews, and to add any new information that the participants felt was relevant to the Project. The dates and composition of the community review meetings in 2011 are found in Table 3.4-3.

Focus groups in the format of review meetings were held as part of the community review process, and conducted by representatives from Golder and AREVA in Baker Lake, Chesterfield Inlet, Coral Harbour, Repulse Bay, Rankin Inlet and Whale Cove. Table 3.4-3 shows the dates and composition of the IQ focus groups.

Table 3.4-3 Dates and Composition of IQ Community Review Meetings in Kivalliq Communities

Group	Date	Composition
Baker Lake HTO	February 16, 2011	2 women, 6 men
Baker Lake Elders	February 17, 2011	3 women, 7 men
Chesterfield Inlet HTO	June 3, 2011	4 women, 4 men
Rankin Inlet HTO and Elders	February 14, 2011	1 woman, 8 men
Arviat HTO and Elders	February 18, 2011	6 men
Whale Cove	March 21, 2011	2 women, 4 men
Repulse Bay HTO and Elders	February 10, 2011	4 women, 7 men
Repulse Bay Hunters	February 11, 2011	2 men
Coral Harbour HTO and Elders	February 17, 2011	8 participants

Of the 68 participants in the community review meetings held in 2011, 28 had also participated in the interviews and focus groups in 2009. Copies of the maps prepared from the 2009 studies were made available to each of the individuals. These were copies of the same maps that had been presented at the community meetings in November, 2010. In response to comments made by the communities during the community meetings organised by AREVA in November, 2010, the 2011 review meetings provided participants with the opportunity to provide additional information and to update maps with information. Generally, the topics discussed at the meetings included the following:

- Land and marine mammals (including harvesting areas, animal health, important habitats, migration routes);
- Game birds (harvesting areas, animal health, important habitats);
- Fish (including species, harvesting, fish health, spawning areas);
- Traditional use of vegetation;
- New wildlife species observed;
- Culturally important areas or sites (e.g., cabins, burial sites);
- Observed changes in weather patterns;
- Observed changes in water quality or quantity; and
- Potential effects of the Project on wildlife or traditional activities.

In response to the Draft Project Guidelines that had been received from the Nunavut Impact Review Board (NIRB), topics related to ice formation, ice travel, and the potential effects of the Project on wildlife along the potential Project transportation corridors were also discussed. As in previous focus groups, additional information was recorded in notebooks and on maps.

3.4.4 Information from the Socio-Economic Focus Group Discussions

Key informant interviews and focus group discussions were arranged with representative groups in each of the Kivalliq communities (e.g., women's groups, rotational workers, young adults) to collect information for the Socio-Economic Baseline Report. Interviews and focus groups discussed topics such as women's roles, dependency on country foods, and traditional activities. During the interviews and focus group discussions, participants also provided information on topics relevant to the IQ baseline report, such as wildlife and harvesting activities. Where relevant, information from the Socio-Economic field studies has been included in this report.

3.4.5 2014 Meetings in Chesterfield Inlet and Baker Lake to Discuss IQ and Western Science Results

On February 25, 2014, a meeting was held with the HTO in Chesterfield Inlet and on April 24, 25 and 29, 2014, meetings were held with the Baker Lake HTO and also on April 29 a meeting was held with a group of Baker Lake hunters knowledgeable of hunting and land use of the area. These meetings were scheduled to discuss IQ in general, similarities and differences within IQ collected and similarities and any discrepancies between IQ and western science. The meeting topics focused on wildlife and Inuit land use. A number of maps were presented illustrated available AREVA collected and government baseline ecological data layered with the related IQ data. An example of a map that included both IQ and baseline data is provided below as Figure 3.6-3 where caribou movement in the fall is presented. The minutes and all the maps discussed can be found in Technical Appendix 3B Attachments I and J.

These meetings provided an opportunity to add or clarify IQ and discuss possible reasons for discrepancies within and between western science and IQ when they existed. The information was then added to the IQ data presented in the applicable Baker Lake and Chesterfield Inlet figures in section 4.2 and 4.3 and where applicable throughout discipline assessment in the EIS.

3.5 Community Involvement in the Field Studies

Representatives of the Kivalliq communities were involved in various aspects of the field studies conducted for the IQ baseline. The following summarizes community participation in the interviews and focus groups.

3.5.1 2008 Field Studies

Inuit Qaujimajatuqangit was discussed at all meetings between AREVA and the Baker Lake Community Liaison Committee (CLC) from January 2007 to September 2008. At meetings in March and April, 2007, CLC representatives recommended that Elder IQ should be obtained before selecting road options the Project, and baseline monitoring and IQ collection should begin. The CLC members recommended that Hattie Mannik conduct IQ interviews, and during 2007 the questions were developed. In 2008, Hattie conducted interviews with Baker Lake Elders.

3.5.2 2009 Field Studies

Prior to commencing field studies, the results of the 2008 interviews were reviewed and used to develop interview guidelines for the 2009 field studies. The topics covered in the guidelines have been summarised in Section 2.4.1 and Section 2.4.2 above. A meeting was held with the Regional Liaison Committee (RLC) in February 2009, during which a presentation on the proposed IQ and Socio-Economic field studies was made. The RLC members recommended that youth should be involved in the community process, and that RLC members should help to introduce the socio-economic and IQ researchers to their respective communities.

A community representative from each community assisted with the IQ interviews and focus groups. In Baker Lake, the community representative identified participants for the focus group discussions. Hattie Mannik and Mitchell Goodjohn (Golder) co-led the focus group discussions with Elders and hunters. A community translator was also retained to provide translation during the focus groups.

In Chesterfield Inlet, a community representative reviewed the proposed interview topics and recommended some changes to the questions. As a result, questions regarding cultural sites, and plant use were also included in the focus group discussions. The representative identified participants, arranged the interviews and focus groups, helped to conduct the interviews, and translated where necessary. Similarly, community representatives in Rankin Inlet, Whale Cove,

Arviat, Repulse Bay, and Coral Harbour arranged focus groups, identified participants, and helped conduct interviews and provide translation.

3.5.3 2011 Community Review Meetings

In 2011, community review meetings were arranged in Baker Lake, Chesterfield Inlet, Rankin Inlet, Whale Cove, Arviat, Repulse Bay, and Coral Harbour. Individuals in the communities who assisted with the 2009 interviews were asked to help organise and assist with the 2011 community review meetings. Where those individuals were not able to assist, representatives of the HTOs were able to help. Meetings were arranged with the HTO in each of the communities. Community organisers were provided the names of the participants from the 2009 studies and invited them and other interested individuals to participate in the review meetings.

In addition to the above review meetings, AREVA has held community meetings related to the Project, and a summary of times and discussions of those meetings can be found in Volume 3 and Technical Appendix 3A (Public Engagement Documentation).

3.5.4 2014 HTO Meetings in Chesterfield Inlet and Baker Lake

Representatives of the Baker Lake and Chesterfield Inlet HTOs accepted to meet with AREVA in 2014. AREVA was then able to update the IQ figures with the additional IQ knowledge gained during both of these meetings including using additional IQ sources as suggested by the BLHTO.

3.6 IQ Integration and Influence

In an effort to further increase the transparency of IQ integration beyond the summary sections titled ‘Influence of Inuit on the Assessment’ in EIS Volumes 4 to 9, AREVA also created an IQ and engagement roadmap (Attachment A) that lists locations throughout the assessment where IQ and engagement has been considered.

Homogeneity was not expected during IQ interviews and engagement activities in general, since individuals have varying and diverse life experiences, values and opinions. The use of IQ and engagement quotes throughout the EIS is not intended to represent or reflect a collective voice on any particular topic but to more transparently provide to readers the feedback heard and considered by AREVA as the Project advanced through the envionremntal assessment. AREVA acknowledges differences of views and also some common themes and concerns.

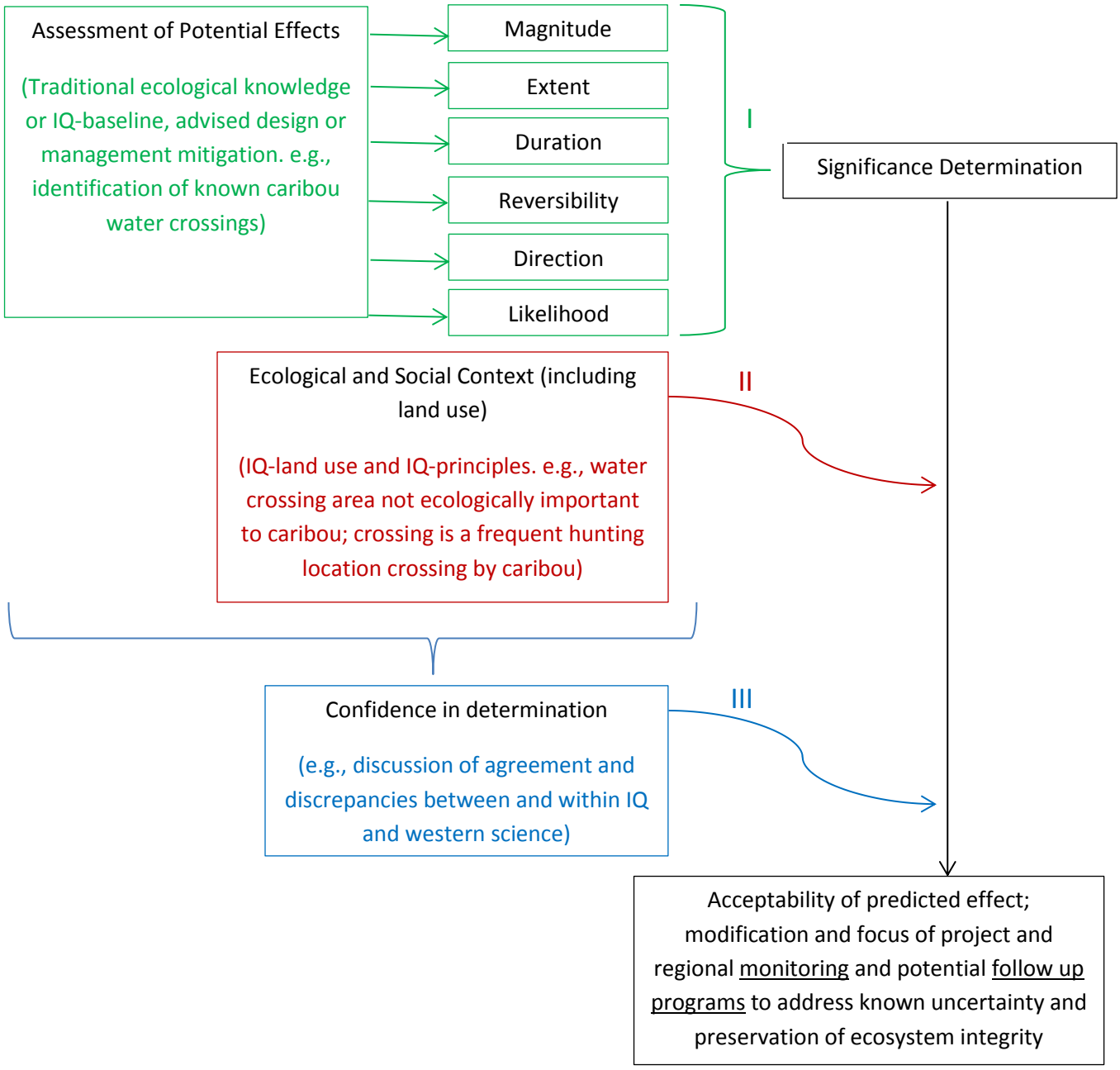
Figure 3.6-1 demonstrates the three primary integration paths for IQ, engagement, and land use into the environemtnal assessment and ultimately to significance determinations and conclusions.

The first path occurs in parallel with the use of western science primarily in the understanding of traditional ecological knowledge and baseline conditions. An example is the identification of caribou water crossings by both IQ and other means and consideration of both sources of information in the assessment and planned mitigation for potential changes in caribou movement (see Volume 6). Consistent with the IQ principles of Pilimmaksarniq and Piliriqatigiingniq, the involvement of local people in baseline studies not only contributed to the knowledge collected but how to best collect that information. The marine mammal surveys supporting the marine assessment in Volume 7 and associated Techncial Appendices were conducted with advice from the Chesterfield Inlet HTO on timing and location. This broad path of integration can be further broken down into categories as presented with examples in Figure 3.6-2. The integration of IQ follows the assessment methodology starting with the identification of potential issues and concerns including project-environment interactions through to moniotoring. Some examples include:

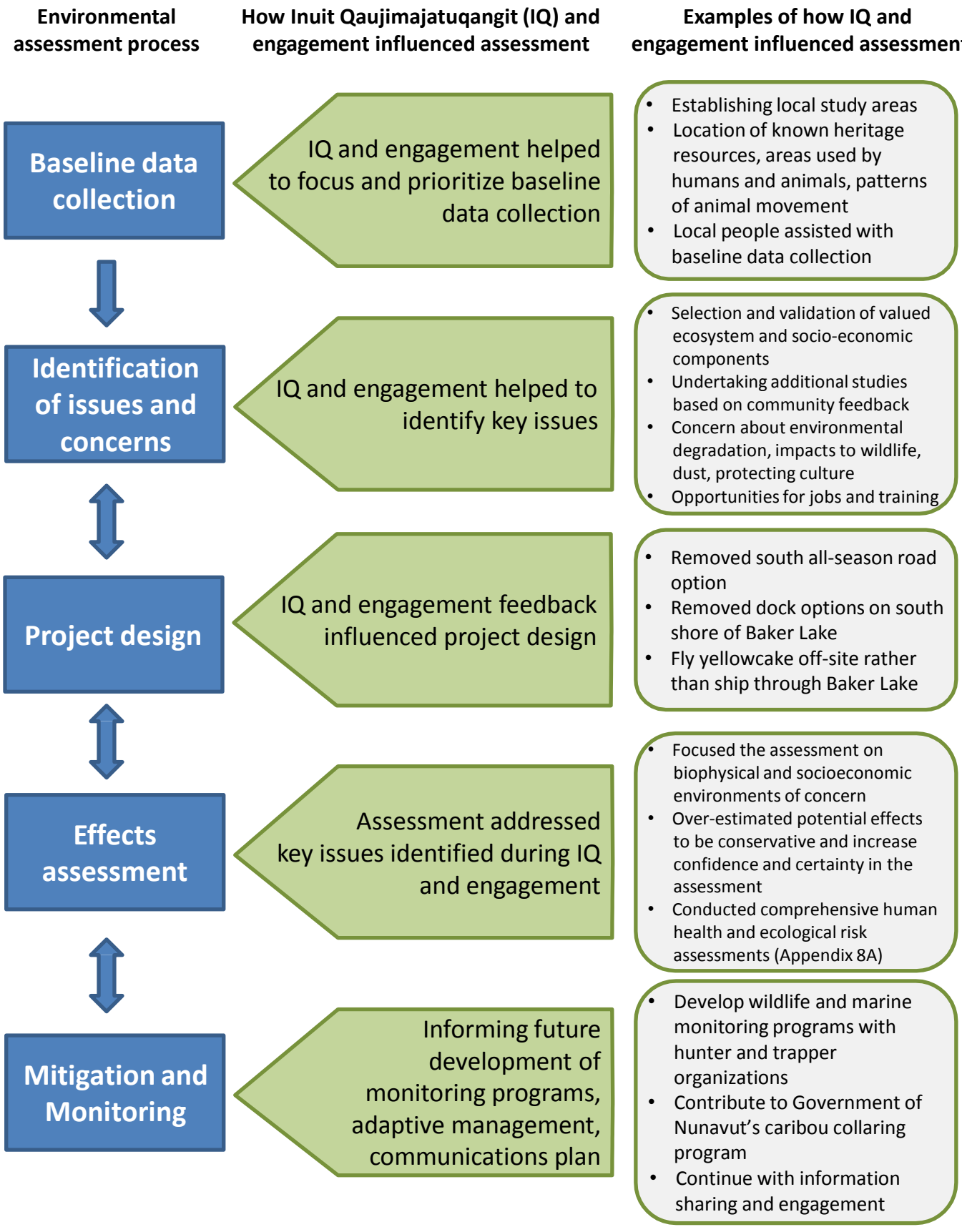
Modifications in the terrestrial, marine and archaeological data collection (Tier 3, Volume 9, Appendix 9B, Section 3.4), identification of Valued Components and an understanding of the value attached to potentially impacted valued ecosystem and socio-economic components (Tier 2, Volume 9, Part 1, Section 4.3), adjustments to the screening level assessments (i.e. Tier 2, Volume 8, Section 6.1.1), and suggested mitigation and management. One example of IQ informed mitigation is the effort to not disturb lead caribou during a migration that can be applied to road management.

Land use informed by IQ was important in the socio-economic effects assessment (Tier 2 Volume 9) and also to provide context to the ecosystem based assessments and the Project as a whole, the second broad path of integration in Figure 3.6-1. A presentation on land use is provided as Technical Appendix 1F to accompany Volume 1 the Main Document. It provides a focused summary on traditional and contemporary land use, Inuit views and values as well as information on protected, recognized, special and distrubed areas.

An evaluation of similarities and discrepancies within and between knowledge bases informed confidence in assessment determinations. Confidence determinations lead into the development of proposed monitoring to evaluate the accuracy of predictions and the effectiveness of mitigation so that adaptive management can ensure the protection of ecosystem integrity.



Three Primary Pathways for IQ and Land Use to Contribute to Environmental Assessment Conclusions


Environmental assessment process
How Inuit Qaujimajatuqangit (IQ) and engagement influenced assessment
Examples of how IQ and engagement influenced assessment
Baseline data collection
IQ and engagement helped to focus and prioritize baseline data collection
Establishing local study areas
Location of known heritage resources, areas used by humans and animals, patterns of animal movement
Local people assisted with baseline data collection
Identification of issues and concerns
IQ and engagement helped to identify key issues
Selection and validation of valued ecosystem and socio-economic components
Undertaking additional studies based on community feedback
Concern about environmental degradation, impacts to wildlife, dust, protecting culture
Opportunities for jobs and training
Project design
IQ and engagement feedback influenced project design
Removed south all-season road option
Removed dock options on south shore of Baker Lake
Fly yellowcake off-site rather than ship through Baker Lake
Effects assessment
Assessment addressed key issues identified during IQ and engagement
Focused the assessment on biophysical and socioeconomic environments of concern
Over-estimated potential effects to be conservative and increase confidence and certainty in the assessment
Conducted comprehensive human health and ecological risk assessments (Appendix 8A)
Mitigation and Monitoring
Informing future development of monitoring programs, adaptive management, communications plan
Develop wildlife and marine monitoring programs with hunter and trapper organizations
Contribute to Government of Nunavut's caribou collaring program
Continue with information sharing and engagement

3.6.1 Use of IQ Principles

As discussed in section 1.2 above, IQ Principles have been adopted by AREVA in some aspects of doing business within Nunavut. IQ Principles are highlighted throughout the EIS to highlight areas of particular consistency. An example is in Tier 2 Volume 8, Section 7.1 (Assessment of Project Effects on Human Health). In this section AREVA discusses the similarities between the Environmental Risk Assessment (ERA) and Human Health Risk Assessment (HHRA) process with the IQ guiding principles. This includes the complementary nature of the ERA/HHRA approach with the Inuit view of a holistic, interconnected ecosystem which includes humans.

A second example is the compliance, environmental monitoring and mitigation measures associated with the aquatic environment that incorporate many IQ guiding principles (GN 2009) in Tier 2 Volume 5 Aquatic Environment. Some of the principles mentioned include Qanuqtuurnunnarniq (being resourceful to solve problems), Avatimik Kamattiarniq (environmental stewardship), and Pilimmaksarniq (skills and knowledge acquisition) and Piliriqatigiingniq (collaborative relationships or working together for a common purpose).

3.6.2 Style Used for IQ Integration

IQ and engagement records were entered into a database, sorted by discipline and then further sorted by application to envioronmental assessment methodology stages (e.g. VEC selection, project-environment interactions, temporal and spatial boundaries, mitigation). Each discipline lead was provided the sorted and original records for integration throughout their assessments with available scientific information.

In order to differentiate the meeting type that information was collected, all comments integrated throughout the EIS have either “IQ” or “EN” prior to the reference to differentiate IQ from Engagement. There are two styles used to integrate IQ and engagement comments into the body of text. The first style is the use of italics when using the comment directly. The second style is the use of footnotes when using the comment as a reference. Full references of the integrated IQ and engagement can be found in the references section of each volume. The following is an example of both styles used:

Style 1:

Italicize the comment (and include quotations for exact quotes):

For example*: "The seals are fatter in the fall when the ice starts to form. While seals are hunted year-round, there is not much seal harvesting in the summer. Seals shot in the summer may sink in the water because they do not have much fat. Seals are hunted in the fall and is the main reason people travel to the ice floe edge"* (IQ-ARVJ 2011).

OR

For example: *Workers are mostly buying equipment to go hunting. Hunting is enjoyable and provides food to households* (IQ-BL04 2008).

Style 2:

Use of footnotes:

For example: *Caribou migrate* (EN-XX ABC Mon YEAR[21])

Italics are used to identify the comments recoded during either an IQ or engagement event when it is not a direct quote. Particularily with AREVA hosted engagement events, participants make every effort to record comments and concerns as heard and intended by the individual sharing the information but they are notes and a reflection of what AREVA staff have heard and recoded and not necessarily a quote.

3.6.3 IQ Presentation in Figures

IQ data is presented in figures throughout the EIS with efforts to make each figure focused on a single theme as appropriate for the assessment discussion. The presentation of a single theme was requested by the Baker Lake HTO to increase readability. The following provides examples of some IQ overlay figures used in the discipline specific assessments.

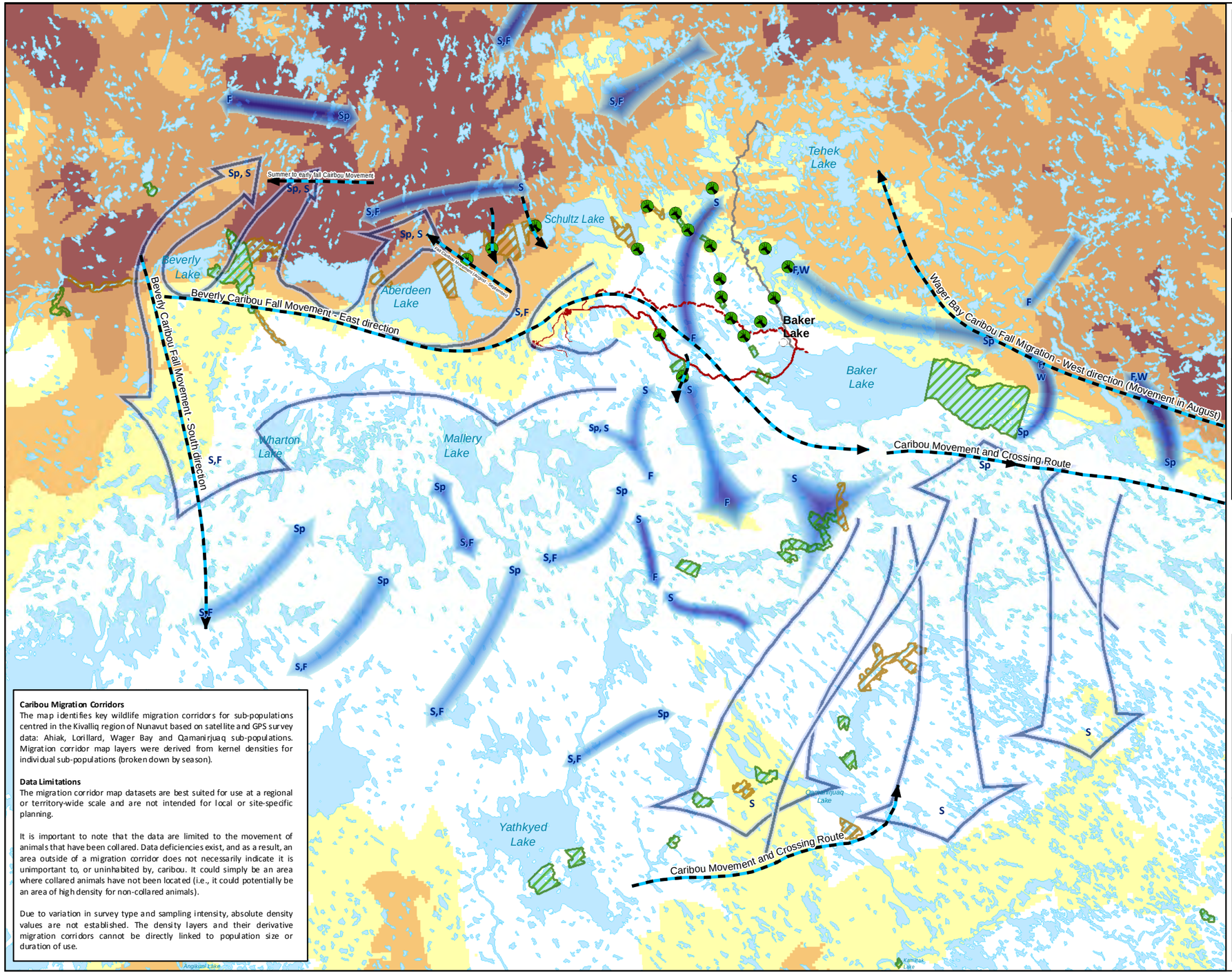
[21] EN-XX ABC Mon YEAR: *caribou migrate all over this place from Repulse to the tree line*

As mentioned in section 3.4.5, relevant IQ and other shape files were overlayed to improve the presentation of spatial information from multiple sources and enhance discussion on both baseline knowledge and effects assessment. AREVA created IQ maps at a spatial scale that focuses on the area surrounding the Kiggavik Project that is of greatest relevance to that assessment or at a scale that is the most relevant to the Project. An example of how AREVA presented both IQ (from multiple sources) and scientific information can be seen on Figure 3.6-3 Caribou movement in the fall in the Baker Lake area. This figure includes the IQ data gained during AREVA's IQ study and follow-up meetings as well as IQ from the Nunavut Atlas and IAND with full references for data sources within the figure legend. This work allowed a spatial evaluation of seasonal caribou migrations and movements in relation to the proposed project location. For a complete discussion on caribou movement, refer to Volume 6, terrestrial environment.

The Nunavut Atlas provided a valuable source for IQ. This information was digitized by a GIS technician for use and consideration in the assessment. Figure 3.6-4 is a presentation of the IQ on land use from the Nunavut Altas.

An additional valuable source of IQ was provided by the KIA. This information is publically available through the KIA online mapping application. Figure 3.6-5 is a presentation of KIA provided IQ on wildlife. The data presented here is from the research of the Traditional Ecological Knowledge and management System (TEKMS) which is also referenced in McDonald's et. al. 1997 publication *Voices from the Bay* (McDonald et. al. 1997). Examples of where this data was used can be seen in Figure 3.6-6 on the distribution of polar bears and temporal avoidance of polar bear preferred landscape use during the open water season when AREVA proposes marine transport activities. A full discussion can be found in Tier 2 Volume 7 Marine Environment Section 6.

Finally, the results from the IQ study and engagement efforts are presented in Figures 4.2-3, 4.2-4, 4.2-5, 4.3-1, 4.3-3, 4.4-1, 4.4-2 and 4.8-1. As stated earlier, this data was often overlayed with baseline or other sources of data for discussion during HTO meetings or use for discussion throughout the EIS.



Caribou Migration Corridors
The map identifies key wildlife migration corridors for sub-populations centred in the Kivalliq region of Nunavut based on satellite and GPS survey data: Ahiak, Lorillard, Wager Bay and Qamanirjuaq sub-populations. Migration corridor map layers were derived from kernel densities for individual sub-populations (broken down by season).

Data Limitations
The migration corridor map datasets are best suited for use at a regional or territory-wide scale and are not intended for local or site-specific planning.

It is important to note that the data are limited to the movement of animals that have been collared. Data deficiencies exist, and as a result, an area outside of a migration corridor does not necessarily indicate it is unimportant to, or uninhabited by, caribou. It could simply be an area where collared animals have not been located (i.e., it could potentially be an area of high density for non-collared animals).

Due to variation in survey type and sampling intensity, absolute density values are not established. The density layers and their derivative migration corridors cannot be directly linked to population size or duration of use.

Western Science Legend

Caribou Migration
Fall Migration Corridor (Sepember - November), Campbell et al. 2012*
Increasing Use

Caribou Water Crossings
Caribou Water Crossings, GN 1978~

IQ Legend

Caribou Migration
Migration Routes, IAND 1978~
Migration Routes, IAND~(Sp = Spring, S = Summer, F = Fall, W = Winter)

Caribou Movement
Local Caribou Movements, AREVA 2014>

Caribou Water Crossings
Caribou Water Crossings, Riewe 1992<
Caribou Water Crossing, AREVA 2014>

Mine Site Legend

Proposed Kiggavik Site
Proposed Winter Road (Preferred)
Proposed All-Season Road (Option)
Meadowbank All-Season Road (Existing)

References

*Campbell, M. W., J.G. Shaw, C.A. Blyth. 2012. Kivalliq Ecological Land Classification Map Atlas: A Wildlife Perspective.Government of Nunavut, Department of Environment. Technical Report Series #1-2012. 274 pp.

<Riewe, Rick (Editor). 1992. Nunavut Atlas. Canadian Circumpolar Institute and the Tungavik Federation of Nunavut. Edmonton, AB.Art design Printing Inc.

>AREVA 2014. Kiggavik Environmental Impact Statement. Tier 3, Technical Appendix 3B: IQ Documentation.

~Department of Indian Affairs and Northern Development. 1978. Effects of Exploration and Development in Baker Lake Area Volume 1-Study Report & Volume 2-Map Supplement. Prepared by Interdisciplinary Systems Ltd. Winnipeg, MB.

GN Caribou data collected and analysed by: Mitch Campbell - Government of Nunavut, Department of Environment, Wildlife Division
Background: Collar locations collected between 1993 and 2012.

This map is not intended to be a complete representation of what is known

Projection: NAD 1983 UTM Zone 14N
Compiled:TL
Date: 06/02/2014 Scale: 1:1,500,000
Data Sources: Natural Resources Canada, GeoBase®, National Topographic Database, AREVA Resources Canada Inc., IAND, Baker Lake Hunter Focus Group, Baker Lake Hunters and Elders 2014, Gebauer & Associates.

FIGURE 3.6-3
LAYERED REGIONAL CARIBOU MIGRATION, LOCAL MOVEMENT AND CROSSING INFORMATION - FALL

ENVIRONMENTAL IMPACT STATEMENT
VOLUME 3 - PART 2

30 0 30
Kilometers

File: Q:\SHEQ\GIS\KIGGAVIK\2014\EIS\Volume 3 - Public Engagement and IQ\Volume 3 - Tier 2\IQ - Part 2\Maps\MXD\Figure 3.6-3 Layered_Regional_Caribou_Migration_Movement_&_Crossing_Information_Fall.mxd

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IQ Legend

- Travel Routes
- Campsite
- Archaeological Site
- Fishing Site

Land Use Intensity

- High
- Medium
- Low

Mine Site Legend

- All-Season Road
- Winter Road (Preferred Option)
- Meadowbank All-Season Road
- Kiggavik Site

Inuit Land Use Description

1 BL (Aberdeen) - Land use in the area north of Schultz Lake has been irregular in recent years. Arctic Fox trapping may occur from February to April. Caribou hunts depend on the movements of migrating herds in spring and fall. Domestic fishing in support of hunting or trapping occurs in the larger lakes.

2 BL (Aberdeen) - In some years, significant numbers of barren-ground caribou winter in the Whitehills-Tehek lakes area. In these years extensive caribou hunting takes place from fall through spring, especially in the vicinity of Whitehills Lake. Trapping for Arctic fox also occurs in February and March of most winters. Domestic fishing, especially in Whitehills Lake, provides food for hunters and trappers. Baker Lake residents commonly travel to Whitehills Lake in spring and summer to occupy seasonal fishing camps.

3 BL (Aberdeen) - The Aberdeen-Schultz-Baker lakes corridor is heavily used year-round by residents of Baker Lake. Seasonal camps are common, especially in summer. In summer and fall, the large numbers of migrating barren-ground caribou which pass through the area are hunted at crossing-points on the Thelon River. The wolves, which normally follow the caribou herds, are also heavily hunted. In recent years, significant numbers of wintering caribou have been killed north and east of the settlement during the winter months. Trapping for Arctic fox in this area occurs from November to April. In November and December, activity is heaviest close to the settlement, whereas in February and March trappers are usually found farther from the settlement. It is common for residents of Baker Lake to travel up the Thelon River or along the shore of Baker Lake in spring or summer to set up weekend or seasonal camps.

4a BL (Aberdeen) - This small area receives similar, but less intensive, hunting and trapping than adjacent areas to the north, east and south.

5 BL (Aberdeen) - Between Baker Lake and Pitz Lake is the most heavily-utilized part of this area. In late spring and early summer, large numbers of geese and some ducks are hunted. Eggs are also collected. Domestic fishing is also heavy at this time. Jigging is the most common means of catching fish before break-up while nets are used in the summer. Trapping for Arctic fox goes on all winter but is heaviest in November and December when the casual and weekend trappers frequent the area. Depending on the movements of the migrating herd, barren ground caribou are hunted in late summer.

6 BL (Aberdeen) - Arctic fox are trapped in this area each winter, usually in February and March, Camps are established on larger lakes and fish provide an important source of food for trappers. In some years, significant numbers of barren-ground caribou winter in the Princess Mary Lake area, and, in those years, caribou may be hunted and domestic fishing is irregular.

7a BL (Aberdeen) - The Judge Sissons Lake area is sometimes used as a travel route westwards to Aberdeen Lake. Use of the area for fox trapping, caribou hunting and domestic fishing is irregular.

7b BL (Dubwant) - In some years, small scattered groups of barren-ground caribou winter in the vicinity of Forde Lake and western Thirty Mile Lake and may be hunted in early or late winter. Depending on the availability of caribou near Baker Lake, hunting may also occur in late summer at well-known caribou crossings on the Kunwak River and at the western end of Thirty Mile Lake or at the north end of Forde Lake in late winter. Domestic fishing supports all hunting and trapping activities. Ducks and geese are hunted in this area occasionally.

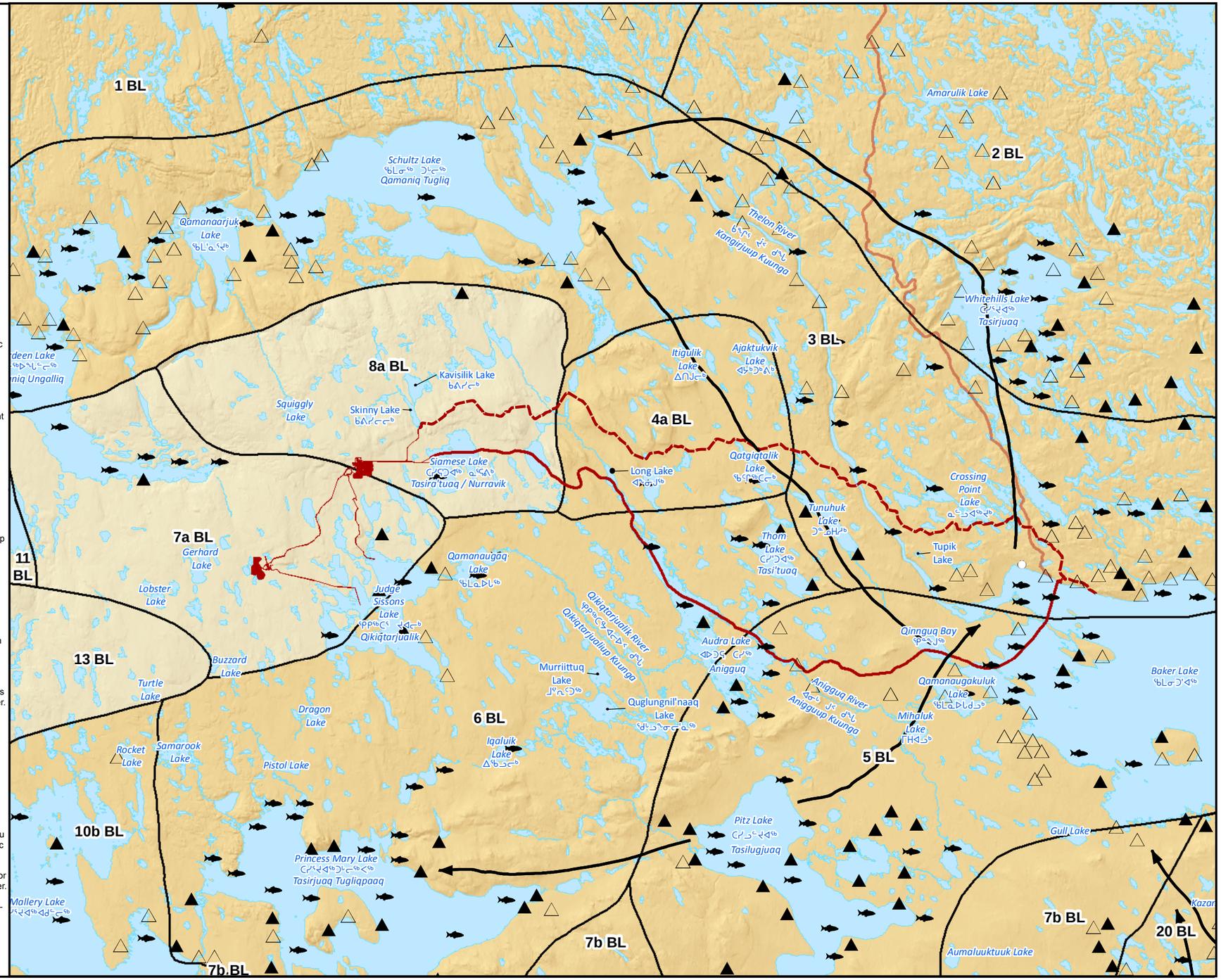
8a BL (Aberdeen) - Very little hunting or trapping activity has been reported in these areas in recent years.

10b BL (Dubwant) - In some years, small scattered groups of barren-ground caribou winter in the vicinity of Mallery Lake. In those years, they may be hunted throughout the winter months, depending on whether the caribou are available close to Baker Lake, Trapping for Arctic fox may occur in November-December or February-March. Activity in this area is usually subsidiary to that in the area to the northeast.

11 BL (Aberdeen) - The area surrounding Aberdeen Lake received less-regular use than the area 3BL. Depending on the movements of caribou, and their availability closer to the settlement, hunters or trappers may set up camps at the narrows or western end of Aberdeen Lake. In summer and fall, barren-ground caribou may be hunted when they cross the Thelon River. In February and March, Arctic fox may be trapped. Domestic fishing is carried out in support of hunting and trapping.

13 BL (Aberdeen) - Hunters occasionally travel to Beverly Lake via the Thelon River to hunt caribou in spring or summer. It is also common to hunt ducks or geese and to collect eggs on the island north of the Dubwant River.

20 BL (Chesterfield Inlet) – The area along the Kazan River and east to Bisset and Parker lakes receives year-round usage by residents of Baker Lake. Hunting is done by canoe, along the Kazan River in late summer and fall as the migrating caribou move south and westward. During the winter of some years, it is possible to hunt wintering barren-ground caribou in the vicinity of Parker Lake. Trapping for Arctic fox takes place in November and December, and in February and March, primarily along the Kazan River valley. Domestic fishing, in support of hunting and trapping activities, takes place along the Kazan River and larger lakes.



Projection: NAD 1983 UTM Zone 14N
Compiled:TL
Date: 09/16/2014 Scale: 1:500,000
Data Sources: *Rick Riewe (Editor). 1992. Nunavut Atlas. Canadian Circumpolar Institute and the Tungavik Federation of Nunavut. Edmonton, AB.Art Design Printing Inc. Natural Resources Canada, Geobase®, Nation*

FIGURE 3.6-4
INUIT LAND USE AS PRESENTED IN THE 1992 NUNAVUT ATLAS

ENVIRONMENTAL IMPACT STATEMENT
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10 0 10
Kilometers

KIGGAVIK PROJECT

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File: Q:\SHEQ\GIS\KIGGAVIK\2014\EIS\Volume 3 - Public Engagement and IQ\Volume 3 - Tier 2\IQ - Part 2\Maps\MXD\Figure 3.6-4 Inuit Land Use as Presented in the 1992 Nunavut Atlas.mxd

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Legend

Beluga Whale Calving or Feeding Area

- Calving Area
- Feeding Area

Bowhead Whale Range

Season

- Early Spring
- Spring
- Summer
- Early Fall
- Winter
- Canada Goose Nesting Area
- Capelin Area or Range
- Harbour Seal Range
- Polar Bear Denning
- Polar Bear Denning Area
- Ringed Seal Range
- Snow Goose Nesting Area
- Walrus Feeding Area
- Walrus Haulouts

N

Connery River
Armit Lake
Smoke Lake
Connery River
ard Lake
Saqvaqjuaq River
Chesterfield Inlet
Meliadine Lake
Josephine Lake
Josephine River
Parallel Lake
Rankin Inlet
Whale Cove
Coral Harbour

Projection: Lambert_Conformal_Conic
Compiled: TL Drawn: TL
Date: 9/17/2014 Scale: 1:750,000
Data Sources: *TEKMS Study, c/o Municipality of Sanikiluaq, 1994 (Provided by KIA) Natural Resources Canada, Geobase®, Nation Topographic Database, AREVA Resources Canada Inc.*

FIGURE 3.6-5
WILDLIFE IQ PROVIDED BY THE KIA FROM
THE HUDSON BAY TEKMS STUDY (TEKMS 1994)

ENVIRONMENTAL IMPACT STATEMENT
VOLUME 3 - PART 2

15 0 15
Kilometers

KIGGAVIK PROJECT

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File: Q:\SHEQ\GIS\KIGGAVIK\2014\EIS\Volume 3 - Public Engagement and IQ\Volume 3 - Tier 2\IQ - Part 2\Maps\MXD\Figure 3.6-5 Wildlife IQ provided by the KIA TEKMS.mxd

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IQ Legend

- Polar Bear Sighting +
- Polar Bear Summering Area <
- Polar Bear Denning Area *
- Polar Bear Range +
- Polar Bear Denning *

Western Science Legend

- AREVA Polar Bear Sightings July 29, 2009 >
- AREVA Polar Bear Sightings August 29, 2009 >
- Polar Bear Denning ^
- Polar Bear Distribution ^

Polar Bear Seasonal Distribution

- Winter Concentration ^
- Summer Retreat ^

Shipping Route

- Proposed Barge Route
- Proposed Shipping Route

N

Kugaaruk

Repulse Bay

Coral Harbour

Baker Lake

Chesterfield Inlet

Approximate Southern Limit of Foxe Basin Polar Bear

Approximate Northern Limit of Western Hudson Bay Polar Bear

Rankin Inlet

Whale Cove

Arviat

References

> AREVA 2014. Kiggavik Environmental Impact Statement. Tier 3, Technical Appendix 7A: Marine Environment Baseline

+ AREVA 2014. Kiggavik Environmental Impact Statement. Tier 3, Technical Appendix 3B: IQ Documentation

< Riewe, Rick (Editor). 1992. Nunavut Atlas. Canadian Circumpolar Institute and the Tungavik Federation of Nunavut. Edmonton, AB Art Design Printing Inc.

* Kivalliq Inuit Association (KIA). 1994. KIA Land Management Database. (GIS features consolidated from multiple sources by the KIA). Rankin Inlet, NU. Application: http://184.70.38.178/kia.publicwebapplication/

^ Department of Environment, Government of Nunavut

Projection: Lambert_Conformal_Conic
Compiled: TL Drawn: TL
Date: 9/17/2014 Scale: 1:3,250,000
Data Sources: *TEKMS Study, c/o Municipality of Sanikiluaq, 1994 (Provided by KIA) Natural Resources Canada, Geobase®, Nation Topographic Database, AREVA Resources Canada Inc.*

FIGURE 3.6-6
POLAR BEAR IQ & WESTERN SCIENCE FROM AREVA & THE KIA

ENVIRONMENTAL IMPACT STATEMENT
VOLUME 3 - PART 2

60 0 60
Kilometers

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File: Q:\SHEQ\GIS\KIGGAVIK\2014\EIS\Volume 3 - Public Engagement and IQ\Volume 3 - Tier 2\IQ - Part 2\Maps\MXD\Figure 3.6-6 Polar Bear IQ & Western Science From AREVA & the KIA.mxd

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3.6.4 IQ and Scientific Knowledge Discrepancies

Available IQ information was presented with scientific information. In many cases, IQ and western scientific information was in agreement, validating and strengthening the assessment and confidence in assessment determinations. Figure 3.6-7 is an example of IQ and western science related to caribou calving grounds showing some difference but overall consistency and alignment.

Discrepancies or variation within and between the IQ and western scientific data exisits. This is addressed both in discussion of technical boundaries or limitiations near the start of each assessment and also in the concluding sections that discuss confidence in the assessment determinations and how that level of confidence is addressed in proposed mitigation and monitoring.

When scoping potential project-environment effects, western science indicated that underwater noise from project shipping would be an unsubstantive effect to marine mammals. Using only western science this project-enviornment interaction would not have bene carried forward to a full and detailed assessment as the assessment would have focused on those items deemed to be of higher importance and with higher potential for unacceptable effects.

IQ strongly indicated concern related to Project generated underwater noise and the potential for disruption to marine mammals, in particular beluga whale and ringed seal. Given the discrepancy AREVA took a more precautionary approach and fully assessed this interaction. Refer to Tier 2 Volume 7 Marine Environment Section 6.1.1 and Tier 3 Technical Appendix 7B Underwater Acoustic Modelling for the assessment details.