Kiggavik Project
Final Environmental Impact Statement

Tier 3 Technical Appendix 6C:
Terrestrial Wildlife Baseline

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

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Authorship

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1 Introduction

1.1 Overview

AREVA Resources Canada Inc. (AREVA) has proposed a uranium mine project (the 'Kiggavik Project', or the Project) in the Kivalliq region of Nunavut, in the area around the community of Baker Lake (Figures 1.1-1 and 1.1-2). The Project proposal is for development of a uranium mine and mill complex within the Kiggavik and Sissons lease areas, and includes open pits, an underground mine, mill facilities, access roads, and other supporting infrastructure. The Kiggavik and Sissons leases are located approximately 80 km west of Baker Lake.

The area around the Kiggavik and Sissons leases has been the subject of exploration and study since the late 1970s by various parties. Following initial feasibility and baseline studies, review of existing information, and the submission of a formal Project Proposal in 2008, AREVA initiated the procedural requirements towards completing a Draft Environmental Impact Statement (DEIS). Baseline investigations that began in 2007 in support of the Project Proposal were advanced in 2008, 2009, and 2010 in support of the DEIS.

The objective of this Terrestrial Wildlife Baseline Report (TWBR) is to provide applicable information on the existing mammal and bird resources in the immediate and regional areas around AREVA's Kiggavik and Sissons leases. The baseline information will be used to assess the potential effects of the Project on the terrestrial environment.

The TWBR summarizes all available information on invertebrate, bird, and mammal populations — scientific data, Inuit Quajimajatuqangit (IQ), and public engagement input — collected from 2007 to 2013. Historical studies conducted in the 1970s and 1980s in the Project area are integrated, as applicable. Regional scientific data and IQ also inform the TWBR. In doing so and wherever possible, the report presents the current situation for terrestrial wildlife resources in the local and regional area surrounding the Kiggavik Project. Other components of the terrestrial environment that are critical for wildlife habitat, in particular vegetation resources, are included in the Vegetation and Soils Baseline Report (VSBR; Technical Appendix 6B).

This report is organized as follows:

- Section 1 — Introduction;
- Section 2 — Setting;
- Section 3 — Study areas;
- Section 4 — Methods for terrestrial wildlife studies;

- Section 5 — Results of terrestrial wildlife studies;
- Section 6 — Summary of key baseline results;
- Section 7 — References cited;
- Section 8 — Glossary of terms; and
- Attachments, including a complete wildlife species list.

1.2 Purpose

The purpose of the TWBR is to describe the existing terrestrial wildlife resources that may be affected directly or indirectly by the Project and to provide sufficient information to support the environmental assessment, to develop mitigation and management plans, and to design ongoing environmental monitoring of potential Project-related effects. Specific objectives of the TWBR to achieve this purpose include:

- summarizing available historical wildlife data, and describing baseline wildlife survey data collected from 2007 to 2013;
- integrating Inuit Quajimajatuqangit (IQ) and public engagement data related to baseline wildlife conditions;
- reviewing and summarizing information available on species conservation status, distribution, abundance, general biology, and habitat use for Valued Ecosystem Components (VECs; see below); and
- assessing wildlife habitat suitability in the Kiggavik area based on Ecological Land Classification (ELC) units developed in the VSBR (Technical Appendix 6B).

Comprehensive information on species status, biology, distribution, and abundance will be important in determining potential Project-related effects on wildlife resources.

1.3 Scope

In 2007, AREVA began comprehensive wildlife surveys to prepare for the environmental assessment and permitting process. The baseline program is also part of a long-term monitoring strategy continued in 2008, and studies are ongoing. Wildlife baseline data collection was most intensive from 2007 to 2010, targeting areas around proposed Project facilities (e.g., mine site, road alignments, etc.), and extended to the larger regional area (see Section 3). The scope of the baseline program was to collect information on all of the main wildlife groups, including:

- small mammals;
- upland breeding birds;

- waterbirds (i.e., birds that typically nest very close to water and spend most of their time foraging on or around waterbodies and wetlands, including gulls, jaegers, waterfowl, and some shorebirds);
- birds of prey;
- ungulates, including caribou (*Rangifer tarandus*) and muskox (*Ovibos moschatus*); and
- predatory mammals (e.g., grizzly bear [*Ursus arctos*], wolverine [*Gulo gulo*], wolf [*Canis lupus*]).

As outlined in Section 4 Methods, the baseline data collection program included aerial and ground-based survey components with more recent investigations focused on ground-based studies to avoid potential negative effects on wildlife associated with aerial-based surveys. Animal tissue was also collected for metals and radionuclide analyses.

Available literature sources were reviewed and included in the TWBR wherever they provided an additional and comparable level of detail to baseline survey data. A key source of information was the historical data from previous work in the Kiggavik area, including feasibility and environmental assessment studies in support of a mine development project proposed by Urangesellschaft Canada Ltd. (from the 1970s through to the 1990s). Other regional studies also provided valuable information.

IQ and public engagement data defined the scope of the baseline program at all stages, from the definition of the regional study area (i.e., areas used for hunting and fishing), to the identification of VECs of greatest importance to hunters and residents (see next section), to the characterization of current and historical presence, movement, and human use of wildlife species in and around the Kiggavik Project. Baseline data collection was greatly enhanced and informed by local Inuit staff hired to assist with field work. Their knowledge of the land, wildlife, and seasonal variability in distribution and abundance of animals, and insight into historical and current land and wildlife use patterns of local Inuit helped define the scope of the baseline program.

1.4 Valued Ecosystem Components

Community consultations and feedback from local residents were a key factor in determining the VECs of importance to the community. Public engagement data were gathered during the 2010 open house tour, where participants were asked to associate values with 24 listed VECs (see Tier 3 Appendix 3A 2010 open house report for a full discussion). Wildlife species were also selected based on their abundance and conservation concern in the region surrounding the Kiggavik Project, their importance in the subsistence economy, the importance of their role in predator-prey systems, the sensitivity of their habitat requirements, and certain local area concerns (e.g., muskox range expansion).

The draft guidelines for environmental assessment provided by the Nunavut Impact Review Board (NIRB) for the Kiggavik Project were consulted when selecting VECs. These guidelines, developed with public input, recommend the inclusion of certain representative terrestrial mammals, raptors, and migratory birds, and species at risk, which are all included in the list below (NIRB 2010). Terrestrial wildlife VECs for the Kiggavik Project are defined as follows:

- terrestrial wildlife and habitat (indicator species are caribou, muskox, and wolf);
- raptors and habitat (indicator species is peregrine falcon [*Falco peregrinus*]);
- migratory birds and habitat (indicator species are Lapland longspur, long-tailed duck [*Clangula hyemalis*], and shorebirds); and
- species at risk (indicator species are short-eared owl [*Asio flammeus*], wolverine and grizzly bear).

General information on the presence and location of other wildlife species (including small mammals and invertebrates) was also collected during the baseline program. Although included in the TWBR, they were not identified as VECs because of their limited importance to local communities. All wildlife baseline data are presented in the TWBR, with special emphasis on the above VECs and indicator species.

Projection: NAD 1983 UTM Zone 14N
Creator: Caslys Consulting Ltd.
Date: 05/06/2014 Scale: 1:16,000,000
File: 1.1-1_Project_Location_Figure
Data Sources: Natural Resources Canada, GeoBase®, National Topographic Database, Geological Survey of Canada, and Caslys Consulting Ltd.

FIGURE 1.1-1
PROJECT LOCATION MAP

KIGGAVIK PROJECT - EIS

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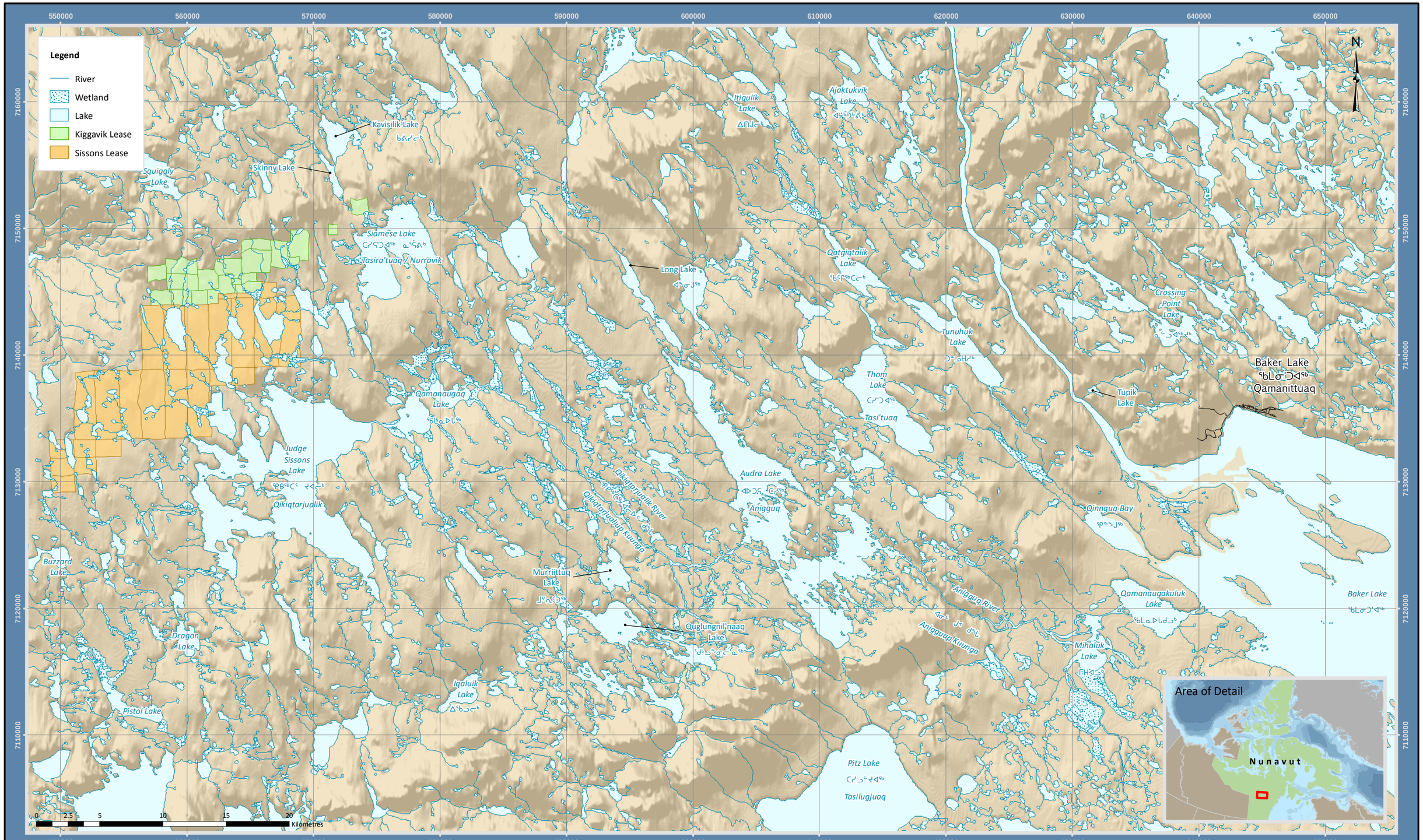

Projection: NAD 1983 UTM Zone 14N
Creator: CASLYS CONSULTING LTD.
Date: 05/02/2014 Scale: 1:275,000
File: 1.1-2_Location_Kiggavik_Sissons_Lease_Areas.mxd
Data Sources: Natural Resources Canada, GeoBase®, National Topographic Database, AREVA Resources Canada Inc., and Gebauer & Associates.

FIGURE 1.1-2
LOCATION OF KIGGAVIK AND SISSONS LEASE AREAS

KIGGAVIK PROJECT - EIS

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2 Setting

2.1 Terrestrial Wildlife Setting

Lying predominantly within the Dubawnt Lake Plain/Upland Ecoregion, the Kiggavik Project area is characterized as having an extreme northern climate, with low structural habitat heterogeneity and relatively few terrestrial vertebrates (AREVA 2008; Wiken et al. 1987). Although the diversity of species in the Arctic may be lower than other ecoregions, the importance of the region in the life cycles of many of these species is well documented. One species in particular, the barren-ground caribou, is one of the principal components of the northern ecosystem.

Tens of thousands of animals from several caribou herds move across the Kivalliq region on a yearly and seasonal basis (BQCMB 1999a, internet site). Some herds, such as the Beverly and Qamanirjuaq, make large seasonal movements between wintering areas (i.e., below the tree line in northern Saskatchewan, northern Manitoba, southern Northwest Territories [NWT], and southern Nunavut, and tundra calving grounds. Other herds, such as the Lorillard, Wager Bay, and Ahiak herds also move great distances across the landscape, but for the most part do not migrate further south to the tree line. The local people, the Inland Inuit, of which most now reside in the Hamlet of Baker Lake, have depended on caribou and their seasonal movements for centuries. Maintenance of healthy caribou populations is one of the key concerns of Elders and community members in Baker Lake. Several wildlife species also depend on caribou for food, including wolf, grizzly bear, wolverine, and Arctic fox (*Alopex lagopus*).

Another predominant mammal species in the Kivalliq region is muskox. Recent trends suggest the muskox has expanded its range rapidly since the mid-1950s when populations were at very low levels (AEM 2005a). This expansion was likely supported by the establishment of the Thelon River Wildlife Sanctuary, where hunting continues to be off-limits (Nunavut Parks 2010, internet site).

Ducks, shorebirds, jaegers, peregrine falcon, upland birds, and other bird species annually migrate from southern wintering grounds to breed in the Kivalliq region during summer. Ptarmigan, gyrfalcon (*Falco rusticolus*), and common raven (*Corvus corax*) are year-round residents. Small mammals such as voles and lemmings are widespread in the region, providing an important food base for predators such as Arctic fox, wolf, hawks, falcons, and owls.

2.2 Human Setting

The Hamlet of Baker Lake, with a population of approximately 1,872 (Statistics Canada 2011, internet site), is the nearest community to the proposed Kiggavik Project (Figure 1.1-1). The

community is situated on the northwest shore of Baker Lake near the mouth of the Thelon River. Baker Lake is Nunavut's only inland, non-marine Inuit community. Traditionally, the Inuit of this area were almost entirely dependent on caribou for subsistence, and moved seasonally with migrating caribou. It was not until the 1950s that the community along the shores of Baker Lake was permanently established.

Historically, the predominant human activity on the land around the Kiggavik Project was subsistence hunting and gathering. Hunting and trapping activity in this area was described as relatively limited in the past (i.e., 1960s and 1970s), for reasons including long distance from Baker Lake, no road access, and the relatively low abundance of target species (IDS 1978). Many Inuit in Baker Lake depend heavily on caribou for food, particularly since interest in 'southern foods' is still low and income levels limit food purchases from grocery stores. IQ studies conducted as part of the AREVA baseline program provide evidence of historical and present day hunting, trapping, and gathering activities around the Kiggavik Project and in the area between the Project and Baker Lake. Residents of coastal communities such as Chesterfield Inlet are also known to travel to the Baker Lake area for hunting opportunities (some details provided in Section 5 of this report). Caribou is the most important wildlife species for local communities, both traditionally and presently. Important caribou hunting areas occur throughout the region. Other species harvested and used include fox, wolf, muskox, and various waterfowl, birds, and eggs. Available government data on historical harvests, and project-specific data on more recent hunting harvest, provide further evidence of historical wildlife harvests (see Section 5.1.4 for discussion and references).

Industrial land use in the region includes mining and exploration activities. The first mine in Kivalliq, the North Rankin Nickel Mine, operated in the 1950s until closure in 1962. Uranium exploration in the area around the Kiggavik Project began in the 1970s. Currently, only one active mine is operating in the Kivalliq region, the Agnico-Eagle Mines Ltd. (AEM) Meadowbank Project located 75 km north of Baker Lake, which began operations in early 2010. The only other mines nearby are not currently active; the Doris North Gold Project located approximately 580 km northwest of the Kiggavik Project, the Tahera Jericho mine located approximately 670 km away, and the Cullaton Lake/Shear Lake Gold Mine located approximately 360 km southwest of Baker Lake. Exploration projects including those for uranium, gold, nickel, and diamonds, occur annually at variable activity levels in the Kivalliq region (Nunavut Geoscience 2010, internet site).