Kiggavik Project

Environmental Impact Statement

Tier 2 Volume 9

Part 1 - Socio-Economic Environment

December 2011

FOREWORD

The enclosed document forms part of the Kiggavik Project Environmental Impact Statement (EIS) submission. 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)".

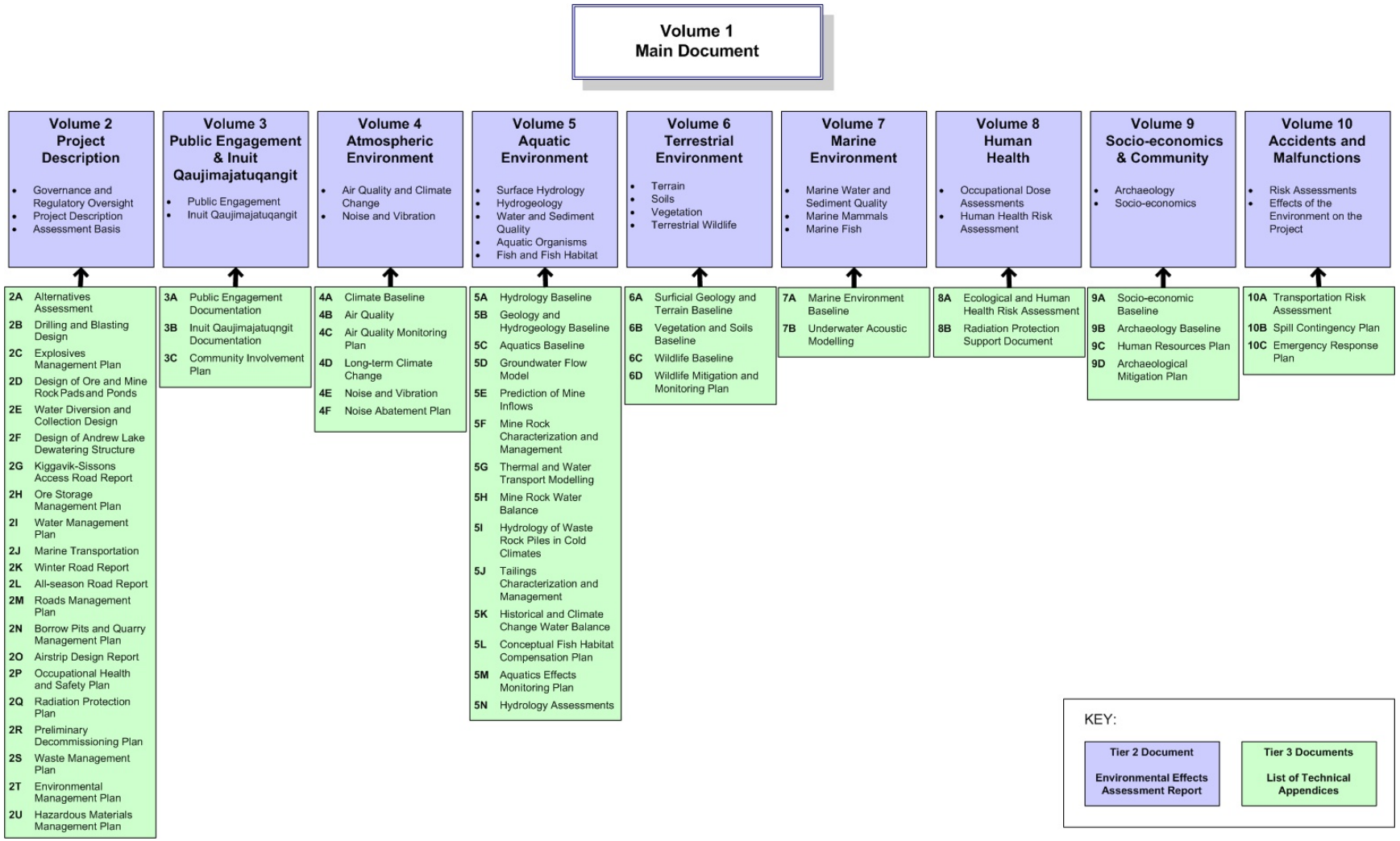
The EIS submission consists of a number of documents, as shown in the attached road map. These documents have been categorized into tiers, as follows:

- Tier 1 document (Volume 1) provides a plain language summary of the 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.

- 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.

ROAD MAP TO THE ENVIRONMENTAL IMPACT STATEMENT



EXECUTIVE SUMMARY – SOCIO ECONOMIC ENVIRONMENT

Nunavut is the regional assessment area for the Kiggavik Project. There will be large economic benefits to the territorial economy and increased revenues to Government of Nunavut (GN) and Nunavut Tunngavik Inc (NTI). Kivalliq Region and its seven communities of Arviat, Baker Lake, Chesterfield Inlet, Coral Harbour, Repulse Bay, Rankin Inlet and Whale Cove make up the local assessment area for the Project. Baker Lake and Chesterfield Inlet are the communities closest to lands and natural resources with some potential to be affected by the Project, but in addition all communities will see economic and social benefits as well as some changes to traditional culture and wellbeing.

Nunavut's Economy

Nunavut's economy and people have unique characteristics, including i) the importance of the mixed economy; ii) a requirement to use renewable and non-renewable resources in sustainable ways that benefit Inuit; iii) the value of Inuit Qaujimajatuqangit (IQ) to economic and social development decision making; iv) decentralization to give communities control of their own development; v) a need to develop self-reliance in face of overdependence on federal transfers; and vi) a very young and rapidly growing population with important socio-economic challenges.

Nunavut's economic development plans focus on the economic sectors that can provide the most growth and employment, without harming the environment. These sectors are mining, tourism and commercial fishing. To achieve growth in these sectors, investments are needed in education, small business development, transportation, energy and telecommunications.

Nunavut's mixed economy has both wage and land based parts. The wage based economy provides cash income. The land based economy provides food, but also important social and cultural benefits to Inuit. Most people try to be active in both the wage and land based parts of the economy. The wage based part of Nunavut's economy has been growing, however not as quickly as needed to provide enough jobs for people. The land based component does not seem to be growing as quickly. Constraints include the high cost of travel on the land, less harvesting by the young, poor markets for animal pelts and climate change.

So unemployment rates have been going up. The unemployment rate in Nunavut was about 19% in July 2011, but for young people it was almost 40%. Most of the unemployed are young Inuit men. Jobs will need to be created faster than they have been in the recent past to reduce unemployment rates as the young grow up to working age. GN expects that mining will bring more economic growth and wage employment over the coming decade than any other sector.

Nunavut is rich in mineral resources, there are large mining projects in development (Meliadine, Mary River and Kiggavik) and exploration interest is very high.

The description of the existing environment for Kivalliq and its communities comes from over ninety i) focus groups discussions in the seven communities with elders, women, youth, hunters, workers, spouses of workers and/or artists; and ii) interviews with individuals. The socio-economic baseline report also relies on IQ collection and consultation results.

Kivalliq's Economy

Kivalliq has an approved land use plan that also says that the best potential for economic development is likely in the mining sector. So the plan sets out conditions for mining – that mining projects should cause no environmental damages and that benefits of mining should go to Kivalliq communities and people. The plan for Kivalliq also says that people in Kivalliq want to have employment opportunities for youth.

Activity on the land provides food, clothing and arts and crafts materials but it is also very important to maintaining Inuit culture. Very few people hunt full time or almost full time anymore but most people continue to go out on the land. It is possible to very roughly estimate how important harvesting is to Kivalliq households. Country food substitutes for about half of what total food costs would be if all food was bought in stores. The practice of harvesting also confirms identity, social relations, values and knowledge.

Kivalliq's Social Context

Kivalliq's population grew from 7,944 to 9,479 people between 2001 and 2009, an average growth of close to 2% per year. Over the last ten years, the fastest growing community was Repulse Bay and the slowest growing was Chesterfield Inlet. But more recently Baker Lake and Rankin Inlet have been growing quite quickly, probably because of in migration into these two hamlets to take advantage of jobs with mining companies and with businesses supplying these companies.

The most complete information we have on education levels is quite out of date (it is from 2006), but it shows that less than 40% of adults have completed high school. On average, younger people are less educated than older people. The problem of not finishing high school is particularly serious in boys – people say that it is harder for boys to get through school than it is for girls. But there are some very recent signs that this may be changing. In Kivalliq there were twice as many high school graduates in 2010 than there were in 1999. Most high school principals think that up to half of their students will graduate over the coming years. This is good, but still means that half of children will not complete high school.

People in Kivalliq feel better about their health than people do in Nunavut as a whole. But they also feel that their health has gotten worse recently, even though people see doctors more often now. Flu and respiratory problems are most common. Infectious disease outbreaks are too

frequent, mostly because of overcrowding and shortages of water. Sexually transmitted infection rates are high. Health care workers are seeing more diabetes and low blood iron – they believe this is because many people are not as active on the land and are eating less country food now. Health workers also say that it is hard for them to diagnose psychological problems – suicidal intentions and other mental illnesses – and that these are important health problems. Smoking, alcohol and drug abuse and uncontrolled gambling are also problems. These harmful behaviours lead to other negative effects on health and on family and community wellbeing.

The maintenance of traditional culture is a very important component of people's wellbeing. Traditional culture gives people identity, and protects more vulnerable people by providing food and other assistance. Family and community ties are maintained through sharing of country food. Traditional celebrations demonstrate recognition and emotional support for people's achievements. Activity on the land keeps skills alive and reinforces Inuit values, for example environmental protection, cooperation, resourcefulness and providing for others.

It has been hard for some people to adjust as a new culture, with different values, has come in. What is expected by employers of people doing work for wages and what is expected of people in Inuit culture can cause some conflict. Some people may feel that their social obligations interfere with their goals for advancing in the new economic environment. People also speak about the misunderstanding between generations that has come with the introduction of southern people's values and material goods. Some elders feel that traditional culture is losing strength in the young. Most of the young say that they are close to their families, respect their elders and respect their culture. But some also say that traditional skills and values are not as useful now as elders seem to think they are. Traditional life also meant people had clear gender roles. But men find it hard now to provide for their families if they don't have work or money to go on the land. It may be easier for women, who still have and take care of children.

Inuit no longer live on the land and the culture has changed. Everybody knows this and most people are focused on how to manage change because it will continue to happen. But people have maintained their language over the last decade – there is strong commitment to Inuktitut and most people feel they speak well. People say however that many children are using English more now than they did in the past.

High crime reduces community wellbeing. Kivalliq has lower crime rates than Nunavut as a whole, but rates are still much higher than in Canada. As people in communities say, the smaller and more traditional communities have less crime than Arviat, Baker Lake and Rankin Inlet have. Poverty and substance abuse are important factors in high crime rates, but it is likely that cultural change is also part of the explanation.

Housing is an ongoing problem in all of Nunavut, but is worse in most Kivalliq communities. More than half of houses are overcrowded or in need of major repairs. Poor housing has bad effects on health, on the way family members get along, and on children's school work. About 40% of people in Kivalliq say they would move if they could. This high demand for housing will

continue to increase as the young population grows older – more people will decide they want to live in their own houses rather than with their families.

Numbers on employment in Kivalliq communities are also out of date. They do not describe the employment changes that have come with Meadowbank. In 2006, Kivalliq was worse off than the rest of Nunavut, and much worse off than Canada. The numbers show that some people in Kivalliq had become so discouraged that they were not looking for work. Women's unemployment rates were lower than men's. Most jobs were with government or in retail stores. Since 2006, there are a lot of new jobs for Kivalliq people with Meadowbank, exploration companies and businesses supplying mining companies. People believe that unemployment rates have gone down, particularly in Baker Lake.

Most people say that there need to be jobs for people who want to work but that it can be hard for Inuit to work on rotation, away from families. Some people can take rotational jobs and be successful and some people can't. People who get and keep their jobs at Meadowbank say they are more confident in themselves, are proud to be able to provide for their families, and are learning a lot on the job. Other people don't like the work and/or the rotation, so they resign.

As part of the socio-economic field work, in 2010 AREVA asked people in 90 different families in Baker Lake some questions about their harvesting practices and diets. This was done to compare the results against those in studies done ten years ago, to see if there had been any big changes to harvesting and diets with Meadowbank. It seems clear from AREVA's study results that traditional activity is very highly valued, and has stayed constant or increased a little bit. The results also show that high employment in Baker Lake in 2010 has not become a barrier to traditional activity.

Issues and Effects

With thousands of engagement, IQ and socio-economic comments from people in Kivalliq and governments, there are very many issues that people have said are important to assess. For purposes of the socio-economic assessment, these have been grouped into six major socio-economic components: i) community economies; ii) traditional culture; iii) community wellbeing; iv) public infrastructure and services; v) non-traditional land use and land use planning; and vi) the economy of Nunavut. Each of these major socio-economic components has been further broken down into VSECs, including such things as employment, harvesting levels, language, health, family function, savings, demand for housing, policing, tourism, land use in Baker Lake and revenues to GN and NTI.

Community Economies

There are many interactions not just between VSECs and the Project, but between one VSEC and another. For example, the Project will create jobs, which in turn can affect the practice of traditional culture, which in turn can affect wellbeing. Different individuals or groups of people can respond differently to an effect. For example, some individuals can respond badly to

rotational work with poor personal choices, and a rotational job will have a different effect on the worker than on the spouse, who is more likely to be a woman. Generalizing about effects quickly becomes unsatisfactory to many people, but is necessary.

Very broadly then the Project's primary effect is the creation of economic opportunities for Kivalliq labour and businesses, during both construction and operations. Because such direct benefits have ripple effects throughout economies, more people that just Kiggavik workers and suppliers will see new economic opportunities. Community economies will grow, and job experience, education and training, and contracting experience will enhance the capacity of the labour force. The benefits of economic opportunities to Kivalliq residents are expected to gain momentum with time.

Rotational work does not require people to move, but people with these jobs who choose to move can do this. Most jobs created in community economies are expected to be in Baker Lake and Rankin Inlet as these two hamlets have the competitive advantages of geography and experience to date. Thus some in migration, predominantly from other areas of Kivalliq, and consequent higher population growth rates are expected in these two hamlets. Decisions to migrate are considered more likely to occur during the early years of operations, as people adjust to rotational employment and foresee some economic security for themselves and their families.

Traditional Culture

Taking up these new economic opportunities has implications for traditional culture, as more people transition into the wage based economy and adapt to the expectations and requirements of operating in cross cultural working environment. Particularly in concert with ongoing cultural change in Kivalliq, this process is expected to contribute to a cultural shift.

Income and rotational work provide resources and opportunities for harvesting. But a cultural shift can result in less practice of traditional activity, more use of English, and less commitment to the application of traditional values and knowledge. Any reduction of harvesting, or sharing of harvest, has potential for effect on food security (particularly of the more vulnerable), nutrition and thus health.

Ongoing government support for traditional culture is expected to ensure that at least some proportion of the population retains traditional skills, language, values and knowledge. The effect, again not only of the Project but also of other factors, is expected to one of reduced practice rather than loss.

Wellbeing

Both increased incomes and cultural shifts have implications for wellbeing at the individual, family and community levels. Many people thrive with expanded economic opportunity, securing their roles as providers within families and having the incomes and savings to increase their

standards of living and household economic security. But some people do not. In failing to personally manage stresses, they can harm their families. As well, any erosion of traditional culture can have negative effects on some individuals' sense of wellbeing and also sets up potential for discord within families, including between genders and between generations.

Individual challenges with new economic opportunities are not expected to manifest in reduced individual, family or community wellbeing overall. Unemployment and poverty also are causes of negative social behaviours, and many people will respond well to new economic opportunities. To the extent that people do struggle with transitioning to the wage economy, this is likely to be most often seen during the construction phase and early years of operations, until such time as adjustments and adaptations can be made.

Not everybody will have access to new economic opportunities. Some of these will be the more vulnerable segments of the population, such as single female parents of young children and the more unemployable. Any erosion of traditional culture, particularly of harvesting and sharing – a safety net for the less fortunate – has potential for harm, including to elders no longer able to harvest. Inuit values of sharing, consensus decision making and equity have some potential to give some way to the more individualistic ethic of southern culture, with consequent effects on, for example, crime levels and social cohesion.

Public Infrastructure and Services

In the expectation that overall, community wellbeing will increase as a result of the Project, need for some social services should also decrease, particularly social assistance. There is however a correlation between increased income and increased demand for health, housing and municipal services. Increased incomes also imply more need for police, as people are out and about more. Improving economic opportunities are expected to motivate more demand for education.

These are benefits to the extent that government is able to deliver in a timely way, but where there is some disconnect between new demand and supply response, the more vulnerable are expected to disbenefit disproportionately. The expected more rapid population growth in Baker Lake and Rankin Inlet will also increase demand for public infrastructure and services here. There are also some cost implications where capacity constraints are identified, however AREVA's payments of royalties and taxes will provide significant additional revenues to GN (as well as NTI). As with most other potential negative effects of the Project, any disconnects between supply and demand are expected to be resolved with time.

Nontraditional Land Use

The Project, if approved, is expected to be a stimulus to mining development, including uranium mining development, in western Kivalliq. Mining development is a stated goal of both territorial and regional governing agencies. However Nunavut does not yet have a land use plan that identifies appropriate use for specific areas, and existing information on land use indicates that

some expected land uses are not compatible. For example caribou breeding grounds and some exploration licenses overlap in western Kivalliq.

Economy of Nunavut

As Meadowbank has demonstrated, large mining projects can be expected to have enormous effects on Nunavut's economic indicators. GDP, employment, labour income and investment levels will change dramatically for the better in response to both the construction and operations phases of the Project. As noted above, revenues of GN and NTI will also increase.

Socio-economic Management

To manage socio-economic effects, AREVA has developed a Community Involvement Plan and a Human Resource Development Plan. Project design has been adjusted, in response to community input, to protect environmental resources (and any consequences on harvesting) and to alleviate any fears associated with the storage of uranium in Baker Lake. Socio-economic management, however, is primarily effected through commitments to implement measures to mitigate the potential for negative effects and more importantly to enhance benefits for Inuit. Socio-economic management also includes extensive opportunities for community engagement and participation in Project decision making, and collaborative monitoring.

It is noted that AREVA's commitments as list below are expected to be included in the IIBA negotiated with KIA. The measures are derived from lessons learned elsewhere in Nunavut and northern Canada, precedents set in earlier IIBAs, and suggestions during engagement. AREVA's corporate experience in Saskatchewan has also been drawn upon.

AREVA''s will maximize **employment and contracting opportunities** for people in Kivalliq communities. The major elements of this are i) preferential hiring, including points of hire in each of the Kivalliq communities; ii) preferential contracting, and helping businesses to overcome barriers to accessing Project contracting; iii) education, training and scholarship programs; iv) accommodating Inuit culture in the workplace as practical for improved job satisfaction; v) wide dissemination of information on available employment and business opportunities; and vi) requiring similar benefit enhancement on the part of contractors.

It is noted that **education and training** will include on pre-employment, life skills, high school completion, postsecondary, on the job, and mentoring programs for workers and prospective workers. AREVA will also work with Kivalliq education authorities to implement school based programs for children, to contribute to their ability over the longer term to successfully participate in both the wage and land based economic activity.

Work force management policies are largely intended to ensure that Inuit employees are equitably compensated, have opportunity to engage in traditional activity and are provided workplace conditions that accommodate Inuit culture. There is also the expectation that all workers will conduct themselves appropriately both at the mine site and when in communities.

Workforce management measures emphasize; i) rotational work schedules to enable trips on the land in weeks off work; ii) worker codes of conduct (including expectations of respect for difference) iii) facilitating, where appropriate, use of Inuktitut and traditional practices at the mine site.

AREVA's initiatives to support individual, family and community **wellbeing** include: i) providing a confidential employee and family assistance program; ii) staffing the mine site and community offices with peer and elder counselors; iii) providing communication systems for people to stay in touch with families; and iv) supporting community initiatives to address community priorities towards enhanced wellbeing, including as examples, assistance to elder and child care and recreational opportunities for youth.

Risks to worker and public health and safety are largely related to the Project land and marine transportation routes. Risks are managed through i) the application of best health and safety practice; ii) emergency response planning; and iii) avoiding and minimizing any environmental effects that have potential to affect livelihood resources and/or public health. Nevertheless heightened perception of risk is expected. This will be addressed through continuing education on uranium mining, and its environmental and socio-economic effects.

As throughout Project development, AREVA will continue to **engage**, including with elders to capture **IQ**, for input on socio-economic management measures and needed adjustments (adaptive management). AREVA will also continue to provide the information people need to engage and participate in the Project effectively. AREVA fully acknowledges the importance to conduct meetings and provide information not only in English but also in Inuktitut.

Monitoring with include reporting on the uptake of economic opportunities, but AREVA also expects to collaborate with communities, KIA, GN and AANDC to develop a framework for collaborative monitoring of community wellbeing, primarily through participation with the Kivalliq SEMC. Details remain to be worked out as the Project moves towards construction in 2017.

Closure (premature or final) effects are most keenly felt in the coming to an end of employment and business opportunities and the consequent negative social effects of an economic downturn. The measures described above include a number of elements that are intended to enhance the economic and social resiliency in communities, which will go some way to attenuating the potential for negative closure effects. Work and business experience will give people a competitive edge in competing elsewhere in the economy. The emphasis on education and training will enhance workforce and business capacity to offer services. As well, at closure retrenchment programs and alternative livelihood training will be offered where necessary.

It is noted that many of the residual effects are contributions of the Project to the ongoing socio-economic dynamic and trends in Kivalliq. As such, governments already have in place a large number of legal instruments and programs that have been developed to address the same kinds of socio-economic change, positive and negative, that has potential to result from Kiggavik.

Examples include language preservation, support to traditional harvesting, expansion of postsecondary education and public health programs.

Residual Project Effects

Project effects are summarized on the basis of a single conclusion for each of 26 Valued Socio-Economic Components (VSECs) identified for assessment. Many actual effects will depend on socio-economic conditions as these will be in Kivalliq in 2017 and beyond. In a rapidly changing socio-economic context, extrapolating current baseline trends can introduce substantial error. Further, the effects of the Project will be additional to those of the proposed Meliadine Gold Project near Rankin Inlet, which is fully expected to be in construction, and perhaps operation, by the time the Kiggavik Project moves to construction.

Although there are some differences in detail, many of the processes are the same in both construction and operations and change in response to the Project will be continuous. Overall, as people adjust to change with time, most negative effects are expected to moderate and positive effects to gain momentum. At closure, the same processes may reverse, however in 2035, or 2046 with an extended Project life, the socio-economic conditions in Kivalliq will again be quite different.

Effects on **community economies** are positive and significant. The Project will preferentially employ, educate and train and contract in Kivalliq. Incomes will increase for many people and community economies will grow. Some migration is expected into Baker Lake and Rankin Inlet. This overall is a positive effect for individuals who choose to migrate and will stimulate additional economic growth in receiving communities. Although the Project will come to an end, the life-long benefits of job experience and learning are not reversed.

Effects on **traditional culture** are overall expected to be negative and significant. The Project will not force or require changes to traditional culture of course, as AREVA's mitigation measures are intended to support and facilitate people's choices. However some drift away from harvesting, use of Inuktitut, and traditional values and knowledge must be expected, particularly in the context of other ongoing forces of cultural change. Climate change is also a factor.

Effects on **individual, family and community wellbeing** are overall expected to be positive and significant. Although negative effects on traditional culture have potential to erode wellbeing for some, broadening choices and opportunities for livelihoods are counteracting factors. There will be individual exceptions to improved wellbeing, and there is some expectation that crime, or awareness of crime, could increase in response to, for example, any developing inequities.

Increased demand for **public infrastructure and services** would be a negative effect if government were unable to meet that demand. However the assessment shows the effect is positive and significant. Revenues to GN and NTI will allow the provision of additional services,

to the benefit of people. In this regard it is noted that the Project itself is not expected to a source of increased demand.

The Project is expected to stimulate interest and may facilitate in some respects additional mining, and uranium, projects, particularly in western Kivalliq. This is a benefit, and significant, insofar as the ongoing **land use planning** process determines that this is the path forward Nunavut and Kivalliq choose. The consequent negative effect on tourism is considered of low magnitude because of little current use of the area by tourists. Land use effects in Baker Lake (including use of the shipping channel) are considered highly manageable, and therefore not significant.

Economic and fiscal effects at the territorial level are positive and significant. There will be very large jumps in gross domestic product, employment, labour income, own source GN revenues and payments to NTI. Subsequently the Project will represent a sustained contribution to the economy and revenues until closure.

Residual Cumulative Effects

For purposes of assessing cumulative socio-economic effects, the scenario is construction and operations of a total of nine large mining projects in Nunavut over the period to 2028. In addition to the Project, the other projects are Meadowbank, Meliadine, Mary River, Doris North phases 1 and 2, Hackett River, Izok Lake and Back River. Most of these projects are not in Kivalliq. However their very high demands for labour and goods, the imperative to maximize Project benefits to Inuit and rapidly growing capacity in Kivalliq to supply the mining sector suggest that there will be spillover effects into Kivalliq Region even where projects are located elsewhere in Nunavut.

These projects are expected to have the same types of socio-economic effects as the Project. Most of these effects will be additive, for example more people will be employed, economies will grow more quickly, there will be more demand for land in Baker Lake and crime levels may go up. However there is some potential that the total effects of all these projects together could be more, or less, than additive. That is, the combination of effects from multiple projects can result in a shift in the socio-economic environment to a state that adding up effects from multiple projects does not fully account for.

In the shorter term, should the combined demand for labour and goods outstrip capacity to supply simply on account of shortages of people in the labour force and should mining proponents then be forced to go south, benefits that notionally could have been retained by Inuit will not be. Nunavut's labour force is growing so quickly that this is not a longer term worry however.

The integrity of traditional culture will in the longer term depend on a significant proportion of people maintaining its practice. The Project alone will not create economic opportunities for all, but any potential for much fuller employment, particularly of the young, may have long term

negative implications for traditional culture. Government programs in support of traditional culture and ongoing importance given by people to maintaining cultural integrity will mitigate the potential for this to some extent, and Inuit do accept that culture evolves.

Rapid development of the mining sector has important implications for the interfaces between traditional and non-traditional land use, including for aspirations to develop a tourism sector. Land use planning in Nunavut has not advanced yet to the phase of delimiting areas appropriate for different uses.

Finally, the cumulative effects of multiple projects will be a significant benefit to the economy of Nunavut. Mining projects eventually close, with potential to cause severe economic and consequent social dislocation for both individuals and the territorial economy. The availability of new projects to take the place of older ones provides alternative jobs and markets for labour and business.

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LIST OF ACRONYMS

AANDC	Aboriginal Affairs and Northern Development Canada
AEM	Agnico Eagle Mines Ltd.
AREVA	AREVA Resources Canada Inc.
CBoC	Conference Board of Canada
CNSC	Canadian Nuclear Safety Commission
CVMPP	Community Vitality Monitoring Partnership Process
EFAP	Employee and Family Assistance Program
EIS	Environmental Impact Statement
DEIS	Draft Environmental Impact Statement
GDP	Gross Domestic Product
GN	Government of Nunavut
GNBS	Government of Nunavut Bureau of Statistics
GNDoEDT	Government of Nunavut Department of Economic Development and Transportation
GNDoF	Government of Nunavut Department of Finance
GNWT	Government of Northwest Territories
GoC	Government of Canada
GoS	Government of Saskatchewan
GST	Goods and Services Tax
HIV	Human Immunodeficiency Virus
HTO	Hunters and Trappers Organizations
IIBA	Inuit Impact and Benefits Agreement
INAC	Indian and Northern Affairs Canada
IQ	Inuit Qaujimajatuqangit
ITK	Inuit Tapiriit Kanatami
KIA	Kivalliq Inuit Association
KMTS	Kivalliq Mine Training Society
MVEIRB	Mackenzie Valley Review Board
NAC	Nunavut Arctic College
NTEDT	Northwest Territories Economic Development and Tourism
NGMP	Nunavut General Monitoring Plan
NIRB	Nunavut Impact Review Board
NLCA	Nunavut Land Claims Agreement

NPC	Nunavut Planning Commission
NSRT	Nunavut Surface Rights Tribunal
NTI	Nunavut Tunngavik Incorporated
NWMB	Nunavut Wildlife Management Board
NWT	Northwest Territories
NWTBS	Northwest Territories Bureau of Statistics
PHAC	Public Health Agency of Canada
RCMP	Royal Canadian Mounted Police
RSA	Regional Study Area
SEMC	Socio-economic Monitoring Committee
Statscan	Statistics Canada
VC	Valued Component
VEC	Valued Environmental Component
VSEC	Valued Socio-Economic Component
WASI	Wildlife Area of Significant Interest

1 INTRODUCTION

1.1 BACKGROUND

The Kiggavik Project (Project) is a proposed uranium ore mining and milling operation located in the Kivalliq region of Nunavut approximately 80 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 JCU (Canada) Exploration Co., Ltd. and Daewoo International Corp.

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 as a secondary 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.

The Kiggavik Project is subject to the environmental review and related licensing and permitting processes established by the Nunavut Land Claims Agreement (NLCA), and to the licensing requirements of the Canadian Nuclear Safety Commission (CNSC). The Minister of Indian and Northern Affairs Canada referred the Kiggavik Project to the Nunavut Impact Review Board (NIRB) for a Review under Part 5 of Article 12 of the NLCA in March of 2010. Pursuant to Section 12.5.2 of the NLCA:

“When a project proposal has been referred to the Nunavut Impact Review Board (NIRB) by the Minister for review, NIRB shall, upon soliciting any advice it considers appropriate, issue

guidelines to the Proponent for the preparation of an impact statement. It is the responsibility of the Proponent to prepare an impact statement in accordance with any guidelines issued by NIRB..."

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.

1.2 NUNAVUT IMPACT REVIEW BOARD GUIDELINES FOR THE ENVIRONMENTAL IMPACT STATEMENT

This volume is intended to address Section 8.2 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), whereby:

'The Proponent shall present baseline information on the functioning and stability of the socio-economic environment in the *regional study area*, with a corresponding impact assessment covering all Project phases of development [construction, operations, temporary closure, final closure (decommission & reclamation) and post-closure]. The Proponent shall also describe the components of the socio-economic environment and the processes affecting them as they exist without the Project. This will serve as a baseline against which the potential changes and impacts of the Project can be measured and will also justify the Proponent's selection of *valued socio-economic components* and indicators.

The Proponent shall provide a clear rationale for its selection of communities, the public consultation carried out, and relevant reference studies and reports from which baseline data is collected. The Proponent shall describe the interactions between the socio-economic and biophysical environments, including the roles of the land- and wage-based economies and the nature of the mixed economy of the North. This is not meant to suggest that the Proponent is responsible for the current socio-economic situation of the Kivalliq Region or of Nunavut, or that it is expected to resolve any problems that are identified. Nevertheless, a proper understanding of the structure and functioning of the potentially affected societies is needed in order to identify the potential of the Project to affect them, whether positively or negatively, and to ensure that any socio-economic mitigation measures put in place by the Proponent have a reasonable likelihood of attaining their objectives.

Whenever relevant and appropriate, data shall be disaggregated by age, gender, and ethnic affiliation. Socio-economic indicators are used to present baseline information and subsequently measure impacts related to the proposed project, those indicators selected must be adequate to address all types of foreseeable impacts, including cumulative and residual impacts. The *environmental impact statement* shall clearly identify and justify the Proponent's selection of indicators. In addition, the Proponent should include a treatment on the temporal aspect of when potential impacts on each relevant *valued socio-economic component* could reasonably be expected to manifest. Finally, the Proponent is expected to clearly identify limitations and

knowledge gaps encountered in its efforts to collect the information required by the following sections of these Guidelines.' [1]

The location of information related to each individual guideline is noted in the environmental impact statement (EIS) Conformity Table (Appendix 1).

1.3 PURPOSE

The EIS has been prepared in fulfillment of the requirements of the NIRB Guidelines.

The purpose of this volume is to describe the Project's expected residual socio-economic effects. The volume first describes the potential for effects, and then describes what socio-economic management measures AREVA will put in place to mitigate negative effects and enhance positive effects (benefits) to Kivalliq Region and its seven communities and to Nunavut more generally.

1.4 REPORT CONTENT AND RELATED DOCUMENTS

In addition to this introduction, this volume consists of the following sections.

- **Section 2** presents a brief overview of the Project.

- A description of the approach used to assess Project effects, somewhat different from the approach general to the rest of the DEIS for the Project, is in **Section 3.**

- The scope and broad methodology of the assessment in **Section 4** sets out issues, VSECs, spatial and temporary boundaries, assessment criteria and determination of significance. The section also outlines the roles in the assessment of engagement, Inuit Qaujimajatuqangit (IQ) and lessons learned from comparable experiences in northern Canada.

- The socio-economic baseline results of particular relevance to the assessment are summarized in **Section 5**.[2]

[1] Italics indicate where acronyms used in the NIRB document have been spelled.

[2] The full baseline is in Technical Appendix 9A, Socio-Economic Baseline

- AREVA's socio-economic management is summarized in **Section 6,**[3] which describes how AREVA intends to mitigate potential negative effects of the Project, enhance potential positive effects (benefits), engage affected people, integrate IQ in socio-economic management and monitor socio-economic effects towards adaptive management. This section also provides information available at the time of writing on the Inuit Impact Benefit Agreement (IIBA) under negotiation with the Kivalliq Inuit Association (KIA).

- **Section 7** presents lessons learned from comparable experiences in northern Canada to set some context for the discussion of the potential for effects in subsequent sections.

- **Sections 8 to 13** present the assessments of effects on the VSECs under each of six major socio-economic components: 1) community economies; 2) traditional culture; 3) individual, family and community wellbeing; 4) public infrastructure and services; 5) land use and planning; and 6) the economy of Nunavut. These sections discuss linkages, briefly consider relevant baseline and socio-economic management measures and then come to conclusions on the significance of residual Project effects. Each of these sections also includes treatment of cumulative and trans-boundary effects (where relevant). Finally, each of these sections also considers how climate change has affected the conclusions on residual effects and/or has potential to change these conclusions (again, where relevant).

- **Section 14** is a summary.

- **Section 15** lists references cited.

- **Section 16** is a glossary of terms used.

Tier 3 documents are appended to this volume to provide further details. These Technical Appendices are as follows:

- 9A, Socio-Economic Baseline
- 9B, Archaeology Baseline
- 9C, Human Resource Plan
- 9D, Archaeological Mitigation Plan

[3] Detailed socio-economic related management plans are in Technical Appendix 3C, Community Involvement Plan and Technical Appendix 9C, Human Resource Development Plan.

Figure 1.1-1 General Location of Kiggavik Project in Nunavut

2 PROJECT OVERVIEW

2.1 PROJECT FACT SHEET

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 U_3O_8) 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.

2.2 ASSESSMENT BASIS

The purpose of this assessment basis section is to define how the expected average design parameters detailed in the Volume 2, Project Description have been bounded to ensure the effects assessments are adequately conservative.

The assessment basis is summarized in **Error! Reference source not found.**-1. For biophysical and some socio-economic effects, the range value with the greatest potential to result in an adverse effect is used. In the case of socio-economic benefits, the range value resulting in the lowest benefit is used.

Table 2.2-1 Project Assessment Basis

Project Activities/Physical Works	Parameter	Units	Parameter / Assumption Values	
			Base Case (PD)	**Assessment Case**
Overall	Production Rate	Tonnes U per year	3,200 – 3,800	3,200 - 4,000
	Mill Feed Rate	Kilotonnes per year	69 – 946	Senes max
	Project Operating Life	Years	14	25
	Project Footprint	ha	938	1,021
Milling	Flowsheet	N/A	No SX	SX Possibly calciner

	Final Product	N/A	Non-calcined	Calcined and non-calcined
Tailings Management	Containment volume	Mm^3	28.4	30.0
	Total tailings volume (un-consolidated)	Mm3	21	30.0
	Design		Natural surround, no drain	Various design contingencies
Water Management	Freshwater requirements – no permeate or site drainage recycle	m^3/day	7,910	8,000
	Freshwater requirements – permeate and site drainage recycle	m^3/day	2,000	8,000
	Freshwater requirements - Sissons	m^3/day	500	600
	Treated effluent discharge at base quality – Kiggavik	m^3/day	2,707	3,000
	Treated effluent discharge – Sissons	m^3/day	1,700	1,700
Power Generation	Kiggavik peak load	MW	12.5	12.5 – 16.6
	Sissons peak load	MW	4.1	0 – 4.1
Logistics & Transportation	Number of barge trips – 5000t & 270 containers	Barge trips / year	9 - 31	31
	Number of barge trips – 7500t & 370 containers	Barge trips / year	7 - 22	22
	Number of truck trips – 50,000L & 48t	Truck trips / year	328 - 3233	3300
	Number of truck trips – 76,000L & 60t	Truck trips / year	243 - 2405	2500
	Number of yellowcake flights	Flights / year	310 - 350	355
	Road Route	N/A	Winter road S	Winter road S Winter road N All-season road N with cable ferry
	Dock location		Site 1	Sites 1, 2,3,4
Decommissioning	Period	Years	10	10

3 ASSESSMENT APPROACH

This section briefly describes the approach used in the assessment of socio-economic effects associated with the Project. The approach is somewhat different to that used for other disciplines, but is considered to meet the applicable regulatory requirements while focusing the assessment on the matters of greatest economic, social, and cultural importance. The approach recognizes the iterative nature of project-level socio-economic assessment, considering the integration of engineering design and environmental effects and management programs into comprehensive socio-economic management planning for the life of the Project.

The assessment focuses on specific VSECs that are of particular value or interest to Inuit, regulators, government agencies and stakeholders. VSECs were selected for assessment based on regulatory issues and guidelines, consultation with Inuit, regulators, government agencies and stakeholders, field studies, and professional judgment of the study team. For assessment purposes, selected VSECs are grouped as major socio-economic components: 1) community economies; 2) traditional culture; 3) individual, family and community wellbeing; 4) public infrastructure and services; 5) land use and planning; and 6) the economy of Nunavut.

The term 'effect' is used to broadly refer to the response of a component of the socio-economic environment to a disturbance. The assessment addresses both Project-related and cumulative effects. Project-related effects are changes to the socio-economic environment that are caused by the Project, or arise solely because of the Project, as defined by the Scope of the Project. Cumulative effects are changes to the socio-economic environment that are caused by the Project in combination with other future projects and activities.

The assessment first considers AREVA's proposed socio-economic management framework, including its component parts of i) mitigation and benefit enhancement measures; ii) ongoing engagement; iii) integration of IQ; iv) monitoring; and v) eventual negotiation and agreement with the KIA of an IIBA. The assessment then considers some experiences in Nunavut, the Northwest Territories (NWT) and northern Saskatchewan with regard to large mining projects. The presentations of the Project's socio-economic management measures and comparable experiences provide background information for the assessment of Project socio-economic effects.

For the assessment of socio-economic effects, the mechanisms through which a socio-economic effect may occur are discussed first, taking into account Project design measures, socio-economic management measures and comparable experiences. Any residual effect is characterized, at a minimum using the criteria of direction, magnitude, geographic extent, duration, and significance is determined, in most cases qualitatively.

Where there is potential for the Project to contribute to a cumulative effect, this is discussed, to identify where there may be some potential to shift a component of the socio-economic environment to an unacceptable state. This element of shift is important. Many socio-economic effects cannot be quantified but can be expected to be comparable between the Project and other large projects that may be developed in Nunavut. Where the effects of other projects and activities are expected to add to change, through mechanisms similar to those of the Project, this is not discussed at length. Only where there is potential for a shift, a change that is more – or less – than the sum of the effects of individual projects and activities, is the potential for a cumulative effect considered in some depth. Residual cumulative effects are then assessed for significance, again necessarily qualitatively.

In determining the potential for cumulative effects, the assessment considers, as relevant, two future scenarios:

- The future scenario includes reasonably foreseeable projects, activities and actions, defined as those that are likely to occur, including projects that are in some form of regulatory approval or have made a public announcement to seek regulatory approval. For this assessment, these reasonably foreseeable projects are:
    - Meadowbank[4]
    - Doris North 1
    - Doris North 2
    - Meliadine
    - Mary River
    - Hackett River
    - Back River
    - High Lake
- The far future scenario includes the future scenario, in combination with possible far future developments in Kivalliq Region.

  It is recognized that exploration activities will continue in the vicinity of the Kiggavik Project, and that there is the potential for additional resources to be discovered during the life of the Project. To address such a possibility, a potential far future

[4] Meadowbank is currently in operations and Doris North 1 in construction; however both are included in the future scenario as their activities are expected to change from what they now are. For example, Meadowbank is planned for final closure in 2019.

development scenario was developed. This scenario assumes additional deposits within a 200 km radius of the Kiggavik site, and the development of a non-uranium operation located within the Kiggavik regional study area (RSA). The Meadowbank gold operation is used as the model for this non-uranium operation. The far future case also assumes that additional resources are found in the Meadowbank area, and that operation of Meadowbank continues. The following projects and activities are included in this scenario.

Table 3.1-1 Far Future Scenario

Component	Locations
Uranium mines	3 mines within 200 km of Kiggavik
Uranium mills	Kiggavik mill
Gold mines	1 mine within Kiggavik RSA Meadowbank region
Gold mills	Meadowbank region Additional mill within Kiggavik RSA
Access Roads	Meadowbank region Additional mill within Kiggavik RSA
Exploration	Induced exploration near the access road(s) and in the Kiggavik area

Due to the lack of information regarding the specific details of potential future developments (i.e., footprint of projects and activities), the assessment of cumulative environmental effects under this far future case is by definition qualitative and is limited to a description of how these projects, activities and actions could affect the magnitude, duration and extent of identified cumulative effects.

4 SCOPE AND BROAD METHODOLOGY OF THE ASSESSMENT

4.1 ISSUES AND CONCERNS IDENTIFIED DURING INUIT, GOVERNMENT AND STAKEHOLDER ENGAGEMENT

Project socio-economic issues and concerns were identified on the basis of:

- input on the Project received during engagement over the course of the preparation of this DEIS, including from NIRB
- regulatory requirements applicable to the Project
- Nunavut and Kivalliq economic and social development contexts
- experiences in comparable contexts in northern Canada
- professional experience and judgment of potential interactions between the Project and the socio-economic condition of affected people

Volume 3, Public Engagement and IQ Report provides the detail of engagement carried out over the DEIS preparation period, from 2006 to mid-2011. Engagement, as well as socio-economic and IQ data collection over 2009 and 2010, enabled the drafting of a preliminary list of issues and concerns that were expected by people in affected communities to be addressed in the socio-economic effects assessment. In addition, AREVA's experience in northern Saskatchewan, lessons learned from other mining projects in Nunavut and NWT, consultant experience with the effects of large mining projects and NIRB's Final Guidelines for the Preparation of the Environmental Impact Statement (EIS) for the Project (NIRB, 2011) have suggested issues additional to those raised by communities during engagement and data collection events. For purposes of this socio-economic assessment, issues and concerns taken into consideration are summarized as:

- The seven communities in Kivalliq have limited employment opportunities. People expect the Project to create employment opportunities across the region. Youth employment is given particular emphasis.

- People recognize the importance of training, both to prepare for employment and to advance once employed. Training is regarded as not only AREVA's obligation but also an obligation of government.

- Contracting opportunities are also expected. Business activity creates additional jobs and income to that generated by direct employment by the Project and is a source of employment that may be preferred by people whose personal circumstances make rotational employment a difficult choice.

- There may be some potential for migration in response to the economic stimulus that Project will represent. Migration in turn can have multiple effects, both positive and negative, on socio-economic conditions.

- There are concerns that sufficient benefits are retained in Nunavut, that is, do not flow outside the territory. There are also concerns that large projects benefit some but not others and that economic benefits of projects are not always distributed according to the potential for negative effects.

- While rapid increases in employment opportunities benefit many, subsequent effects on local businesses and service providers – who must compete in the labour market for workers – include rapid turnover of staff, difficulties in identifying replacement staff, increased training costs and lost productivity.

- Large projects have potential for environmental effects on land, water, air, wildlife, fish and marine mammals. There are three socio-economic aspects to this i) many people still depend on such resources for at least a part of their livelihoods; ii) traditional use of such resources is central to people's sense of identity and wellbeing; and iii) environmental conservation is a fundamental Inuit cultural value.

- Related to the bullet above, people's concerns about environmental effects are heightened on two grounds – the Project is a uranium project and climate change is observably underway.

- Any environmental effects should be considered not only in terms of traditional use of the land and resources for household consumption, but also in terms of commercial uses including commercial harvesting and tourism. The Project may also have implications for the further development of the mining sector. These three sectors are priority economic development sectors in Nunavut and mining and tourism are priority sectors in Kivalliq.

- While participation in the wage based component of the economy is critical to the economic and social wellbeing of Inuit, this needs to accommodate continued land based economic activity. Wage based employment should not be at the expense of

retention, at the community level, of traditional activity, language, skills, knowledge or values.

- While people look forward to increased incomes and many individuals and families will benefit in terms of household economies and wellbeing, there is some concern that rotational work and new income can lead to poor personal choices, such as substance abuse, excessive gambling and inappropriate sexual behaviors. In turn, these choices can be associated with physical and mental health problems, domestic violence, family breakdown, poor parenting, crime and suicide, which can affect not only individual and family wellbeing, but also potentially community wellbeing. Women, elders and children are particularly vulnerable in the event of reduced family wellbeing.

- Social and physical infrastructure and services are often ill equipped to deal with any increased demand as a result of a large project. There are many potential linkages. As examples, changed public behaviors can put pressures on health and policing services, population growth can result in more crowded housing and schools, and the use of any community infrastructure by a project can mean reduced availability for community needs.

- Related to the above, there is an expectation that some Project infrastructure could be of benefit to nearby communities. There is high interest for example in public use of a Project access road. Docking facilities are also expected to benefit communities where these are built.

- Institutional capacity and governance are issues. For example, there are concerns about the oversight capacity of Nunavut's institutions of government relative to the Project with regard to the monitoring of AREVA environmental and socio-economic performance and Government of Nunavut's (GN) capacity to respond to shifts in demand for some government services.

- Concerns about the health and safety of people (including workers) and emergency response preparedness, which are general to large projects, are more acute because of the perceived risks to human health as these are related to uranium mining.

- The construction of a road between Baker Lake and the Project raises an opportunity for improved access to land and its resources, and consequent changes to the intensity, seasonality and geographic distribution of harvesting.

- Road construction may also have implications for traffic and road safety.

- Project effects on all heritage resources need to be considered, including on archaeological sites but also any effects on other sites of cultural value.

- The Project is expected to have positive economic effects not only on the economy of Kivalliq and its seven communities but also on the economy of Nunavut.

- The Project will affect the fiscal position of the GN, both through generation of revenues but also potentially from costs that may be imposed by Project activities and their effects on demand for public infrastructure and services. There will also be fiscal benefits to Nunavut Tunngavik Incorporated (NTI).

- The effects of premature closure, final closure and post closure need to be considered in the assessment. Negative socio-economic effects are of primary concern however the disposition of Project assets at final closure (including for example the all-weather access road – if built, docking facilities, air strip and accommodation complex) is also of interest.

- Cumulative effects are of high interest, especially in Baker Lake and Chesterfield Inlet, given that the Agnico Eagle's Meadowbank Gold Project is in operation and given that many other exploration projects, including for uranium, are underway in western Kivalliq.

- There is a requirement to take full account of IQ in the assessment of Project effects, and the development and implementation of mitigation and benefit enhancement measures and monitoring programs.

- Engagement with governments at all levels and with people in Kivalliq communities will be required throughout the development and implementation of the Project. There is also an expectation of participation by people in Project decision making that may affect them.

- Engagement requires that people have the information they need to engage from an informed position. People have commented during various engagement events on the lack of information on the Project, EA approval processes and the uranium mining industry. There is also concern about accessibility to information for unilingual Inuktitut speakers.

Table 4.1-1 presents a tabulation of large community engagement event[5] results, to provide an indication of the priority people in communities have given to different issues and concerns. It is

[5] It is noted that AREVA's engagement has been continuous for some years and includes ongoing interactions of AREVA staff and consultants with individuals, civil society organizations and government representatives. Comments made during special purpose meetings and casual contacts are not included in the table.

emphasized that the table is indicative only. The various engagement events have had different objectives, presented different information and posed different questions of participants. There are language and interpretation issues in decisions to assign comments to one, and only one, of a small number of categories. People's comments, concerns and questions have shifted over time as more information has become available. These and other factors influence people's input. Nevertheless, the large number of statements considered in the analysis – almost 2,500 – suggests the results are approximately representative.

Table 4.1-1 Issues and Concerns from Large Community Engagement Events (% age of comments)

	2009, Valued Component Inquiry	2009, Survey on Main Interests	2009, Town Hall Comments	2010 Valued Component Inquiry	2010, Town Hall Comments	AREVA Blog	NIRB's Guideline Consultations	All Input
	n=564	n=157	n=175	n=875	n=356	n=26	n=299	n=2,452
Wildlife	36	21	9	27	10	27	26	25
Environment	30	12	13	25	12	15	17	21
Employment, training and business	9	35	26	13	19	19	7	15
Public health	12	9	7	7	13	4	7	9
Social	7	12	2	17	1	0	1	9
Uranium and Project	nr	nr	26	nr	22	31	16	7
EA process	3	0	10	0	16	4	16	6
Infrastructure and services	2	11	2	7	4	0	7	5
Benefits	nr	na	5	4	4	0	3	3
Heritage	2	na	1	0	0	0	1	1
Total	100	100	100	100	100	100	100	100

Source: Derived from review of AREVA's records of the results of various engagement events and from NIRB, 2010
Notes: n=number of comments; nr indicates that an attribute was not relevant to a particular engagement event; na indicates that data are not available.
Volume 3, Public Engagement and IQ provides more detail on the engagement events that head the columns in the above table.

Broadly, points to note about Table 4.1-1 are:

- Wildlife (caribou, fish and marine mammals primarily) and environment (air and water primarily) together accounted for 44% of input. The concerns derive largely from fundamental Inuit values and from dependence on natural resources for livelihoods, but also reflect some apprehension about uranium.

- There was stronger interest in employment and business opportunities initially, but input in these regards has decreased over time. The contents of comments suggest that as of 2010 people had good information on constraints to local hiring, on the need for preparation for employment and on when jobs and business opportunities are likely to become available but still had questions regarding AREVA's hiring procedures and working conditions.

- The uranium and Project category for purposes the table includes primarily questions about uranium and the Project, rather than concerns. Most concerns about uranium were framed in terms of wildlife, environment and public health.

- The Nunavut Land Claim Agreement (NLCA) provides for significant empowerment of Inuit in decision making. However there is some lack of understanding of government processes to ensure participation in decision making, some distrust of both government and its associated institutions, and some skepticism regarding objectivity of information disclosed by both government and AREVA. This is reflected in the unexpectedly high percentage of input about the EA process.

- The social category for purposes of the table includes primarily concerns about potential effects of the Project on individual, family and community wellbeing. Generally, Project effects on wellbeing, infrastructure and services and heritage resources were of less concern to people, and there was little input on any potential for benefit, aside from employment, contracting and training.

Overall, input suggests that whereas there is still some lack of knowledge and some uncertainty about uranium mining in Nunavut, people in Kivalliq are receptive to continuing the EIS process for the Project, provided they can be confident about environmental performance, will see employment, training and contracting opportunities, can be better informed and are able to participate in decision making.

4.2 PROJECT-ENVIRONMENT INTERACTIONS AND EFFECTS

This presentation of socio-economic interactions with the Project and consequent socio-economic effects departs significantly from the presentation used for biophysical effects, for the following reasons.

- Although there are exceptions, socio-economic effects are largely in response to the totality of a project, to its location, scale and operational procedures, and not to its component parts. It is not helpful to attempt to look at the individual effects of water management systems, waste disposal or energy supply (as examples) on employment or levels of traditional activity. Socio-economic assessment more usefully considers responses to a project as a whole. Exceptions can be spatially distinct project components with unique effects such as, in the case of the Project, the access road options and the marine transportation route.

- The linkages between various potential socio-economic effects are interrelated in complex ways, and can be mutually reinforcing. They may also cascade. For example, in migration is itself an effect, but in turn may engender additional effects such as pressures on housing. In migration can also combine with increased incomes to result in public security challenges. Socio-economic effects are thus often in response to 'drivers of change', particular elements and combinations of elements of a project that may have more to do with, as an example, its operational policies and procedures than its built environment.

- For many biophysical disciplines, there are substantive differences between construction and operations phase effects. However, most socio-economic effects occur on a continuum from the initiation of construction activity through operations. Many effects on individuals, families and communities are a result of the same processes (interactions) in both phases. For example, employment and its socio-economic effects will begin with the start of construction and continue through operations. Where construction and operations phase effects are clearly different in detail, these differences are noted in the assessments of effects in Sections 8 to 13 below, however in not all cases are effects of construction and operations discussed separately. Premature closure, final closure and post closure effects are quite distinct from those of construction and operations and are discussed separately, although they are in fact the result of many of the same interactions, operating in reverse.

Accordingly, Table 4.2-1 presents what are considered to be primary Project/socio-economic environment interactions and effects in terms of 'drivers of change', phenomena that can be expected to occur as a result of the Project and that have the potential to result in a significant change to a VSEC.[6] It is acknowledged that there are more interactions than the table includes – the interrelatedness of socio-economic conditions suggests that almost any driver of change can be conceived to have at least some consequent effect on almost any VSEC for at least some individuals. Table 4.2-1 thus indicates where the emphases are placed, on primary

[6] Section 4.3, Valued Socio-Economic Components, provides information on the identification of VSECs.

interactions and effects, in the socio-economic assessments in Sections 8 to 13. This however is not to the exclusion of considering additional interactions and effects related to issues that have been raised during engagement and socio-economic and IQ data collection events.

Table 4.2-1 Primary Project/Socio-Economic Environment Interactions and Effects

Major Socio-Economic Component	Community Economies						Traditional Culture					Individual, Family and Community Wellbeing						Public Infrastructure and Services					Non Traditional Land Use and Land Use Planning				Economy of Nunavut	
	Valued Socio-Economic Components																											
Primary Drivers of Potential Effects on Valued Socio-Economic Components	Employment	Education and Training	Contracting	Economic growth and diversification	Incomes	Population change	Harvesting	Food security	Language	Values and knowledge	Cultural sites	Health	Family function	Savings	Public security	Public health and safety	Social cohesion and participation	Social infrastructure and services	Policing	Housing	Other infrastructure and services	Institutional capacity and governance	Mining	Commercial harvesting	Tourism	Land use in Baker Lake	Economic effects	Fiscal effects
Project Policies and Procedures*																												
Employment	■	■		■	■	■	■	■	■	■		■	■	■	■		■	■	■	■	■	■				■	■	■
Education and training	■	■	■	■	■				■	■				■			■	■				■						
Contracting	■	■	■	■	■	■								■													■	■
Increased incomes				■	■		■	■				■	■	■	■		■	■	■	■	■					■	■	■
Migration	■			■		■									■		■	■	■	■	■					■		
Working conditions	■	■				■	■	■	■	■		■	■		■	■		■										
Rotational work	■					■	■	■	■	■		■	■		■		■	■	■									
Stakeholder engagement										■						■	■					■						
Community contributions										■							■	■			■							
IIBA	■	■	■		■		■	■	■	■	■	■	■			■	■	■			■	■					■	■

Environmental Effects*																											
Project footprint							■	■			■					■					■		■		■	■		
Biophysical effects							■	■			■					■								■	■			
Traffic, ecological health and human health risks							■	■								■								■	■			
Project Components*																											
Winter road							■	■			■					■					■		■					
All-weather road							■	■			■					■					■		■	■	■		■	
Marine transportation							■	■			■					■					■		■	■	■		■	
Project Economics**																											
Project capital investment																										■	■
Project operations expenditures																										■	■
Project taxes and royalties	■		■	■	■												■			■	■					■	■
Closure***																											
Premature, final and post closure	■		■	■	■							■	■	■	■		■	■	■							■	■

Notes: Shaded boxes indicate primary interactions and effects; * interactions apply during both construction and operations; ** capital investment is primarily a construction phase effect while operations expenditures and taxes and royalties are primarily operations phase effects; *** closure effects include almost all of those in other rows, many operating in reverse

4.3 VALUED SOCIO-ECONOMIC COMPONENTS

VSECs are typically defined as being components of the socio-economic environment – such as employment, language retention and access to adequate social services – that are important to people's wellbeing and quality of life. Any change to a VSEC that can be attributed to a project represents a project effect.

For a socio-economic component to qualify as valued for purposes of a project's effects assessment, the component must be known (or be reasonably expected) to occur in the project's area of influence, there must be a reasonable expectation that the component could be meaningfully affected by the project and people must articulate in some way that value is in fact assigned to the component.

Most people do not speak explicitly in terms of valued environmental or socio-economic components (VCs). Engagement results – the content of concerns, comments and questions – suggest VCs for assessment purposes, but are less useful in detailed understanding of why a specific VC is valued or what relative value is assigned a VC. During open house meetings in 2010, AREVA presented wall charts with matrices of 24 VCs (in rows) and 18 grounds on which VCs might be valued (in columns). People were provided sticky notes and invited to indicate at intersections between specific columns and rows where they felt the strongest associations were. There were a total of 875 sticky notes pasted in the seven communities. There were no restrictions on the numbers of sticky notes any individual placed.

The results are presented in Table 4.3-1. The VCs[7] are listed in order of the total number of times each was assigned a sticky note, that is the number of times they were associated with any ground. There are also columns to indicate associations by grounds (for all communities) and by community (for all grounds). For purposes of the table, the 18 grounds were grouped into three broad categories: i) wellbeing, which includes beauty, comfort, peacefulness and happiness; ii) basic needs, which include food, clothing, health and money; and iii) traditional culture, which includes respect, spirituality and culture. It is noted that Arviat, Repulse Bay and Whale Cove had low participation rates in the inquiry thus these community level results should be interpreted with caution.

The basic message of Table 4.3-1 is the diversity of grounds assigned to VCs. In total, about 30% of responses assigned VCs each of wellbeing and traditional culture grounds; and about

[7] The selection of VCs for purposes of this exercise was preliminary and based on engagement results up to mid 2009, experiences of AREVA in northern Saskatchewan and review of the other environmental assessments in northern Canada. With time, the list of VCs has evolved. The list in table 4.3.1 is therefore not completely consistent with VCs as presented in this EA.

40% assigned basic needs grounds. Each of the 24 VCs was valued, on various grounds, by at least 1.4% but no more than 8.1% of responses for the region as a whole. Diversity is also reflected in the few zeros in any column of the table. That is, almost all VCs are valued on each of the three grounds and by at least someone in each community. Finally, diversity is reflected in the mixing of colours in the table (see Note at the bottom of the table). Twenty-three of the VCs are each valued from low (white color cells) to high (orange cells), depending on the grounds and/or the community.

Table 4.3-1 Results of Valued Component Inquiry, 2010 (%age of responses)

Valued Component	All responses	Grounds			Community							Total Number of Reponses
		Wellbeing	Basic needs	Traditional culture	Arviat	Baker Lake	Chesterfield Inlet	Coral Harbour	Rankin Inlet	Repulse Bay	Whale Cove	
Caribou	8.1	2.3	14.8	4.8	9.3	6.8	9.3	7.6	7.0	10.3	13.1	71
Other terrestrial mammals	7.4	6.0	11.1	3.6	2.3	11.8	8.6	2.8	4.5	0.0	11.5	65
Language	6.4	7.9	0.3	13.6	7.0	5.0	6.0	6.3	9.6	7.7	4.9	56
Inuit knowledge	6.2	2.6	0.6	18.0	9.3	5.7	5.3	6.9	6.4	12.8	1.6	54
Training	5.3	9.4	3.1	4.0	7.0	6.1	2.0	5.6	8.3	2.6	1.6	46
Employment and contracting opportunities	4.9	2.6	8.4	2.4	2.3	5.4	2.6	6.3	5.7	10.3	1.6	43
Landforms and soils	4.8	6.4	1.4	8.0	0.0	7.1	4.0	4.2	2.5	2.6	8.2	42
Infrastructure and services	4.5	4.9	5.0	3.2	9.3	5.4	2.0	4.2	5.7	0.0	3.3	39
Water quality	4.3	3.0	6.1	3.2	0.0	6.4	5.3	2.8	3.2	5.1	1.6	38
Traditional harvesting	4.2	3.0	3.9	6.0	4.7	3.2	2.6	6.9	5.1	7.7	1.6	37
Marine mammals	4.1	1.5	6.7	3.2	2.3	2.5	5.3	2.8	5.1	7.7	8.2	36
Community benefits	4.0	5.3	4.5	2.0	9.3	3.2	4.0	4.2	5.1	2.6	1.6	35
Birds	4.0	6.4	3.6	2.0	2.3	3.6	5.3	4.9	1.9	5.1	6.6	35
Vegetation	3.9	4.5	5.0	1.6	0.0	2.9	5.3	4.2	5.1	2.6	4.9	34

Air quality	3.8	4.9	2.2	4.8	0.0	5.4	2.6	4.2	2.5	2.6	4.9	33
Individual and family health	3.5	4.5	3.3	2.8	4.7	3.2	3.3	3.5	4.5	5.1	1.6	31
Public health and safety	3.5	2.3	5.3	2.4	4.7	2.9	4.0	4.2	4.5	2.6	1.6	31
Migration and population growth	3.2	3.0	3.6	2.8	4.7	3.6	3.3	2.1	3.8	0.0	3.3	28
Weather	3.2	4.1	1.7	4.4	2.3	2.1	3.3	4.9	3.2	2.6	4.9	28
Social services	3.0	4.9	2.2	2.0	7.0	1.8	4.6	2.8	1.9	2.6	4.9	26
Fish	2.4	1.5	3.9	1.2	4.7	2.1	1.3	3.5	1.9	5.1	1.6	21
Noise	2.1	3.8	0.6	2.4	4.7	1.1	2.6	2.1	2.5	0.0	3.3	18
Other aquatic attributes	1.8	2.6	1.4	1.6	0.0	1.4	6.0	0.7	0.0	2.6	1.6	16
Water flow	1.4	2.6	1.4	0.0	2.3	1.4	1.3	2.8	0.0	0.0	1.6	12
Total	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**na**
Sample size (no.)	**875**	**266**	**359**	**250**	**43**	**280**	**151**	**144**	**157**	**39**	**61**	**875**
Environmental (VECs)	51.3	49.6	59.9	40.8	30.2	54.6	60.3	47.2	39.5	46.2	72.1	na
Socio-economic (VSECs)	48.7	50.4	40.1	59.2	69.8	45.4	39.7	52.8	60.5	53.8	27.9	na

Source: Derived from review of AREVA's records of the results of the 2010 VC inquiry
Notes: Blue text = valued environmental component (VEC); red text = valued socio-economic component (VSEC); na= not applicable
Orange = greater than 10% of responses; yellow = 5% to 10%; green = 3% to 4.9% and white less than 3%.

With regard to the potential for socio-economics effects specifically:

- Caribou and other land mammals were the most often associated of all VCs. However, these were more often associated with basic need (largely food) grounds than with traditional culture grounds. People hunt because they need to. Fish on the other hand did not draw a lot of associations.

- Inuit knowledge and language were the next most often associated VCs, in all communities, much more so than traditional harvesting as an activity. However, as the bullet above notes, there is a need to harvest to supplement household food supply and this is in part reflected in the associations for each of the caribou and other land mammals VCs.

- There was high inconsistency on the results for the VSEC of employment and business opportunities across communities and people generally seemed somewhat more likely to associate training than they were to associate employment and contracting opportunities with a ground.

- There was no clear differentiation in terms of associations between valued environmental components (VECs) as a group and VSECs as a group. People clearly see their overall quality of life determined both by socio-economic and by environmental conditions. The frequent associations between VECs and basic needs (as opposed to traditional culture) suggest, again, important dependence on environmental resources for livelihoods.

- There are some differences between communities. For example, Chesterfield Inlet did not have many associations for employment and contracting opportunities and had more associations for VECs than VSECs as compared to other communities. Baker Lake has many more associations for land mammals than coastal communities, more in fact than for caribou. In Rankin Inlet, most associations were with VSECs. In general however no clear patterns emerge from the table, suggesting that there is more diversity between individuals than between communities.

VSECs identified for purposes of this socio-economic assessment are in Table 4.3-2, listed by major socio-economic component and in the order of presentation in the assessment of effects sections, Sections 8 to 13 below. The list is somewhat longer than the list of VSECs in Table 4.3-1 above for a number of reasons, including contents of NIRB's final DEIS guidelines.

Table 4.3-1 Valued Socio-Economic Components

Major Socio-Economic Component	Valued Socio-Economic Components
Community economies	• employment • education and training • contracting opportunities • economic growth and diversification • incomes • population change
Traditional culture	• harvesting • food security • language • values and knowledge • cultural heritage sites
Individual, family and community wellbeing	• health • family function • savings • public security • public health and safety • social cohesion and participation
Public infrastructure and services	• social infrastructure and services • policing • housing • other infrastructure and services • institutional capacity and governance
Non-traditional land use and land use planning	• mining • commercial harvesting • tourism • land use in Baker Lake
Economy of Nunavut	• economic effects • fiscal effects

It is emphasized that the VSECs are not organized to reflect relative importance to communities, but in an effort to provide a narrative framework of cause and effect that does not require excessive length, cross referencing or repetition. As an example, community economies are addressed first because the take up of employment, education and training and contracting opportunities offered by the Project is expected to have many consequent effects. For example, expected economic benefits are part of the context for the discussion of potential Project effects on traditional culture and people's wellbeing.

With regard to Table 4.3-2, it is also noted that elements not specifically identified here as VSECs are not unimportant. On the contrary, all elements of economic, social and cultural life integrate and contribute to overall individual, family and community quality of life, and most in fact are subsumed (and will be discussed) within broader VSECs as these are listed above. As well, the diversity of human experience and the range of responses to a project have the result that every component of the socio-economic environment is important to at least some people. A significant effect on a component valued by even a limited number of individuals or families can be important to consider. Finally, there are a number of themes that cut across most or all

VSECs, themes that deserve consideration but are not easily framed as discrete VSECs. These include, as examples, gender, self-reliance (broadly defined here as reliance on one's own efforts to achieve quality of life goals), vulnerability to change and sustainability.

4.4 SPATIAL BOUNDARIES

For purposes of socio-economic assessment, a project footprint is most often considered a study area only where there is a resident population. This is not the case for the Project so there is no Project footprint study area. The Project's local and regional socio-economic study areas are defined below. It is also noted that for some socio-economic parameters, there is some potential for transboundary effects. Whereas areas outside Nunavut are not considered to constitute an assessment study area, where there is some potential for a transboundary effect this is discussed in the relevant subsection of Sections 8 to 13, Assessment of Effects.

4.4.1 Local Assessment Area

Kivalliq Region and its seven communities of Arviat, Baker Lake, Chesterfield Inlet, Coral Harbour, Repulse Bay, Rankin Inlet and Whale Cove make up the local assessment area (see Figure 1.1-1) for all VSECs listed in Table 4.3-2 above with one the exception – the assessment of effects on the economy of Nunavut.

The closest community to the Project is Baker Lake, approximately 80 kms east of the mine site. Chesterfield Inlet is a further 190 km east, adjacent to the Project's marine transportation route from the proposed docking facilities in Baker Lake out to Hudson Bay. These two communities are closest to lands and natural resources with some potential to be affected by the Project, although some individuals in other Kivalliq communities do use, or have in the past used, potentially affected lands and resources.

In addition, economic and social benefits are expected, for all communities in Kivalliq. Such benefits will largely derive from employment, education and training and contracting opportunities. All communities will also benefit from contributions, both those negotiated in the IIBA to be signed between AREVA and the KIA and those that AREVA may make directly. There is however also potential for negative socio-economic effects on individuals and families, as well as at the community level, in each of the seven Kivalliq communities. Such effects are largely associated with the challenges of transitioning into the wage based component of the economy, and more specifically, transitioning into mining related employment with its characteristic rotational employment.

Finally, at the level of Kivalliq Region, there is some potential for the Project to affect non-traditional land use and planning in the priority economic sectors of mining and tourism, and to affect land use in Baker Lake.

4.4.2 Regional Assessment Area

Nunavut is the regional assessment area for purposes of the economy of Nunavut major socio-economic component. Effects on Nunavut are primarily related to the potential for benefit to the territory's economy. There will also be fiscal effects on the GN and on NTI, in terms both of increased revenues and also potentially of some increased costs. In addition, the potential for cumulative economic (and consequent social and cultural) effects, has implications for government and NTI policy and programs in Nunavut.

4.4.3 TEMPORAL BOUNDARIES

Currently the Project is expected to start its four year construction phase in 2017, its 14 year operations phase in 2021 and its four year final closure phase in year 2035. Thus the temporal boundaries for the socio-economic assessment are 2017 to 2039. However:

- there is some potential for the Project's operations phase to be extended by 11 years, to 2046

- the DEIS includes consideration of a far future scenario, focused on potential additional uranium and gold developments in western Kivalliq that do not at this time have a time frame

- given the rapid pace of socio-economic change in Nunavut, projection of potential Project effects into the years of the 2020s, 2030s and 2040s must be considered very speculative.

These three factors have the following implications for the assessment of the Project's socio-economic effects:

- the base case used is the 14 year operations phase – for socio-economic effects this is the more conservative scenario[8]

- the assessment focuses on the construction phase and the first years of operation – this is considered justifiable both on grounds of confidence in predictions but also because

[8] Although there is potential for negative effects, the assessment concludes that there is more potential for benefit. The 14 year operations phase therefore results in a conservative assessment of effects – positive effects are limited to a 14 rather than a 25 year period.

whereas negative effects can be adaptively managed towards minimization in the short to medium term, positive effects are expected to gain momentum with time

- as closure will occur in the far future, in a year and in an economic context that is currently undetermined, the effects of closure are discussed in limited depth – in this regard it is noted that iterative closure planning will ensure that as closure approaches, more will be understood about its potential for negative socio-economic effects and how these can best be managed.

Socio-economic conditions are always evolving, in response to other projects, government initiatives, improved technologies and multiple other factors that can be unknown or unpredictable. As noted in Technical appendix 9A, Socio-Economic Baseline, the baseline that is the basis for assessing the Project socio-economic effects is in some respects already dated as a result of limitations on publicly available data and provides scant insight into what the socio-economic context for Project construction in 2017 to 2021 and Project operations, from 2021 forward, will be.

This assessment's temporal boundaries are therefore such as to suggest that conclusions reached are not necessarily predictive, but rather indicative of the potential for effects, both positive and negative. Over the period 2011 to 2017, there will more learning about the effects of mining projects in Kivalliq and how these effects can be most effectively managed, as Meadowbank continues to operate and, as expected, the proposed Meliadine Gold Project is developed. AREVA will of course continue to review expectations of Project effects and proposed management measures in response, in the interim to 2017 and beyond.

4.5 ENVIRONMENTAL EFFECTS CRITERIA

The criteria for assessing potential socio-economic effects are broadly comparable to those used for biophysical effects. There are, however, some differences in the choice and/or the definition of criteria.

- **Direction** indicates whether an effect is considered positive (a benefit) or negative. Socio-economic effects are not neutral, although some effects may have both positive and negative dimensions, or be positive for some people and be negative for others. As well, some potentially negative effects may become positive with the implementation of socio-economic management measures.

- **Magnitude** refers to the degree of change in a VSEC that an effect has the potential to produce. Magnitude may be negligible, low, medium, or high and is usually (but not always) qualitatively assigned. Negligible indicates no discernible effect. Low magnitude indicates a discernible effect on a VSEC but the effect is not expected to materially affect people's quality of life. Moderate magnitude indicates a noticeable and potentially detrimental or beneficial change to people's quality of life. High magnitude indicates that

the effect is expected to substantially interfere with or enhance the quality of life of at least some individuals, families or communities.

The primary exception to the above relates to some economic effects. A very large project, such as the Project, which is developed, operated and then closed in what are very small territorial and community economies, will have economic effects that, where these are quantifiable, are necessarily of high magnitude. High magnitude criteria are individually defined for most economic VSECs Sections 8 and 13, Assessment of Effects on Community Economies and the Economy of Nunavut respectively. Criteria for low and moderate magnitude for economic effects have not been developed because they are not used.

- **Geographic extent** for most socio-economic effects is considered in terms of administrative units. Local effects are experienced by people closest to a proposed project, in this case people in the seven Kivalliq communities of Arviat, Baker Lake, Chesterfield Inlet, Coral Harbour, Rankin Inlet, Repulse Bay and Whale Cove. Regional effects are experienced at the level of the Territory of Nunavut. Where an effect is expected in some, but not other, communities, this is noted. As well, some effects are experienced by some, but not other, individuals within an assessment area, and may not have community level manifestations. Any potential for particularly negative effects on some individuals needs to be identified and addressed, so these are noted. Where there is potential for an effect to extend beyond Nunavut this is also noted, as a transboundary effect.

- **Duration** refers to the length of time over which an effect occurs. In this case short refers to a period of one year or less. Medium refers to a duration of up to five years. Effects that are expected to continue through the operations phase or through operations into the decommissioning phase, that is for longer than five years, are considered to be of long duration. It will be noted that these durations are not linked to Project phases – for example, a socio-economic effect that persists for 14 years (the Project's operations phase) would have to be considered long term in terms of people's experience of that effect.

Most socio-economic effects are not considered to be reversible (unlike many physical and biological effects) and trend towards being long term. Socio-economic effects are part of an ongoing process of interdependent economic, social and cultural change extending into the future and generally cannot be reversed to return to one or all of pre project development

conditions.[9] For example, although most employment will come to an end at final closure, job experience and training will have enhanced the capacity of individuals to find other employment, with lifelong implications – the employment effect will not be fully reversed. Further, since it is presumed that a project is only permitted if it is expected to bring net socio-economic benefit, a return to pre project conditions may not in fact be desirable. Thus the reversibility criterion is only used, by exception, where an effect can be considered to be fully reversible.

Also, although there are isolated exceptions, most socio-economic effects are experienced continuously by people. Thus frequency is not often a useful criterion for socio-economic assessment. Where frequency is relevant to the assessment of a specific effect, this is noted in the assessment of that effect, again by exception.

Finally, assigning likelihood can be problematical for socio-economic effects. With some exceptions, most socio-economic effects are considered highly likely (almost certainly) to affect at least some individuals even where community level effects may not be observable. In the event that an effect is considered likely, but with less certainty, this is noted in the assessment, again by exception.

Table 4.6-1 presents definitions of socio-economic assessment criteria in table form.

4.6 DETERMINATION OF SIGNIFICANCE

There are important differences in the methods used to determine significance and in the prediction confidence for socio-economic assessment as compared to biophysical assessments.

First, the significance of socio-economic effects must often be determined qualitatively. For example, it may be straightforward to conclude that an effect is not significant if it is very small, is of short duration, and affects almost no one; or to conclude that an effect is significant if it is very large, of long duration, and affects most people. However, determining significance in cases that are less well defined necessarily depends on:

[9] In this sense, most socio-economic effects are cumulative, as they are products not only of a given project but of the interaction of that project and its effects with the broader, continuously evolving, economic, social and cultural environment.

Table 4-6-1 Definitions of Criteria Used in the Assessment

Direction	Magnitude	Geographic Extent	Duration	Reversibility	Frequency	Likelihood	Prediction Confidence
Negative: Adverse effect on a VSEC **Positive:** Beneficial effect on a VSEC	**Negligible:** Indicates no discernible change to a VSEC **Low:** Indicates a discernible effect on a VSEC but the effect is not expected to materially affect people's quality of life **Moderate:** Indicates a noticeable and potentially detrimental or beneficial change to people's quality of life **High:** Indicates that the effect is expected to substantially interfere with or enhance people`s quality of life For quantifiable economic effects, all effects are considered of high magnitude and criteria for high are variable.	**Local/ Communities/ Kivalliq:** Effect is within Kivalliq Region and/or its seven communities **Nunavut:** Effect is within Nunavut **Individual:** Although no community level effects are expected, individuals and/or families are expected to be affected	**Short:** Effect occurs over one year or less **Medium:** Effect occurs over one to five years **Long:** Effect occurs over more than five years	**Most effects are considered to be irreversible** **By exception:** **Reversible:** Effect is transient for duration outlined, beyond which conditions will return to baseline	**Most effects are considered to be continuous** **By exception:** **Periodic:** Effect occurs intermittently or may repeat over the assessment duration	**Likely:** The effect is expected to occur, but may not **High likely:** The effect will almost certainly occur for at least some individuals over the assessment duration.	**Low:** Level of confidence in prediction of significance is low **Medium:** Level of confidence in prediction of significance is medium **High:** Level of confidence in prediction of significance is high

- the perceptions and values of affected people and their leadership (as made evident through engagement)

- qualitative data and interpretation, and observations of the socio-economic reality (including for example resilience in face of change) of a project area

- lessons learned from other experiences

As a result there may appear to be a stronger element of professional judgment, as opposed to the use of quantitative tools (such as decision tress or valued matrices), in reaching conclusions on significance for socio-economic effects.

Second, related to the first point above, there are not established thresholds or standards for most VSECs. Although it may be possible to set thresholds for some socio-economic effects for purposes of an EIS, it often cannot be demonstrated that there is any consensus on any specific threshold value or what such a threshold means in terms of significance of an effect. For example, it might be determined that in migration representing 5% of a community's population is a threshold for magnitude.[10] To the extent that this migration happened over a period of some years, was predominantly made up of people able to access stable employment, consisted primarily of returning family members and/or happened in a community with little natural population increase, this might be considered a benefit and a higher threshold might be warranted. Conversely, the effect might be considered negative under a different set of circumstances. This leaves aside the issue of whether or not it is possible to predict in migration with a plus or minus 5% degree of accuracy.

Third, many socio-economic effects may not lend themselves to the assignment of criteria or determination of significance except in terms of potential, thus introducing a larger element of uncertainty into socio-economic effects assessment. There generally is the expectation that an effect brought forward for assessment will in fact occur, at least to some degree. However, it is, for example, extremely difficult to predict whether some effects will be positive, negative or both, and in what ways for whom. Socio-economic effects will result from interrelationships between:

- Project activities

[10] This, and other examples of the challenges of quantifying many socio-economic effects in this section, is a constructed example for purposes of this discussion only.

- the responses on the part of individuals, families and communities to socio-economic management measures implemented by AREVA

- decisions made by individuals, families and communities with regard to events and situations unrelated to the Project

Fourth, related to the third point above, mitigation and benefit enhancement measures are put in place to create the conditions and opportunities for individuals to improve their lives, that is, to offer mechanisms to enhance the potential for benefit, or at least the avoidance of harm. However, it is not possible to ensure that everyone will necessarily take advantage of those opportunities. There are also always other forces at work outside the control of a single project, which can undermine the success of mitigation and benefit enhancement measures. Thus, while mitigation and benefit enhancement measures are developed, implemented and adjusted over time to provide positive opportunities, poor choices can be made, people may choose not to participate and/or other realities may intrude. The effectiveness of socio-economic management therefore may not always be complete, for everyone. This of course speaks to the importance of adaptive management.

Fifth, related to the fourth point above, it is generally accepted that a project will have some negative socio-economic effects on at least some people. Benefits are expected but some individuals, families and communities will experience some negative effects in a context of overall net socio-economic benefit. This is in contrast to negative biophysical effects, which are most often mitigated into insignificance over the long term, through engineering design, good practice policies and procedures, compensatory environmental improvements, reclamation or other means. Further, there are usually no to very few instances of biophysical benefits resulting from the extraction of a resource (although proponents are able to create environmental benefit where this is considered appropriate).

In summary, the challenges of quantification, thresholds, unpredictability, and effectiveness of socio-economic management measures and expectations of both negative and positive residual effects together imply that the approach to socio-economic assessment, for most effects, is more qualitative and nuanced than for biophysical assessment. In coming to conclusions on residual socio-economic effects, there is necessarily high dependence on engagement results (see Section 4.8), IQ (see Section 4.9) and comparable experiences – in this case, experience in relation to other large mining projects in northern Canada (see Section 4.10). Socio-economic assessment, particularly in the case of the Project, also must give important weight to socio-economic baseline trends, that is, not only to current socio-economic conditions. Evolving change can be expected to interact with the Project over its life cycle.

The methodology for this DEIS is to describe residual effects as either ‘not significant’ or ‘significant’, on the basis of assigned criteria. For purposes of the socio-economic assessment, each residual effect is determined to be not significant or significant on the basis of the expected result for most people and/or of the effect’s manifestation at the community level. This is not to suggest that effects that may be experienced at the level of some individuals and/or families are

not important, or even critical, to quality of life. Where this is the case, the effect is discussed, AREVA will implement mitigation and benefit enhancement measures in response, and the residual effect will be assigned attributes in terms of the criteria described in Section 4.5, Environmental Effects Criteria. Such effects however are determined to be not significant in terms of quality of life for most people and/or at the community level.

Finally, confidence in the prediction of whether an effect is significant or is not significant is often high, irrespective of all the uncertainties in describing the detail of that effect. This may at times seem to be a contradiction. Two examples may illustrate. Section 9, Assessment of Effects on Traditional Culture, comes to the conclusion that the Project will have a significant negative effect on the maintenance of traditional age and gender roles. This is because virtually any negative effect on traditional culture is considered important by so many people in Nunavut. Confidence in the prediction of significance is thus high, irrespective of the challenges of defining in detail how these changes will manifest. Section 13, Assessment of Effects on the Economy of Nunavut, can only provide an approximation of effects on GDP and labour income, but even in the event of large errors in the approximation, the Project`s effects on GDP and labour income will necessarily be significant.

4.7 INFLUENCE OF INUIT, GOVERNMENT AND STAKEHOLDER ENGAGEMENT ON THE ASSESSMENT

Socio-economic assessment is inherently consultative. Primary data collection was done solely through contact with people in Kivalliq, and the population of Kivalliq is over 90% Inuit. Although socio-economic data collection, IQ data collection and engagement are conceptually different and have different objectives, each engages affected people and all result in the expression of views on the Project, its effects, preferred mitigation and benefit enhancement measures and processes for adaptive management.

Government and stakeholder input largely comes from formal engagement events – open houses, and meetings with hamlet, regional and territorial government representatives and with civil society organizations. Importantly, the process of developing and finalizing NIRB's EIS Guidelines also provided input on the Project.

In addition, AREVA's website, Project office in Baker Lake, frequent senior staff presence across Kivalliq and wide dissemination of the coordinates of staff responsible for the Project have provided multiple avenues for proactive contact by Inuit, government and stakeholders with concerns, comments and questions.

Thus, in addition to the socio-economic data, both IQ and engagement results were reviewed for comments of relevance to the socio-economic assessment. The results of the various forms of engagement have influenced the socio-economic assessment by:

- guiding the development and then refinement of primary data collection program for the baseline – for example the clear concerns about potential effects on traditional culture motivated a data collection event to capture any changes in harvesting activity and associated values, as well as in consumption of country food, in Baker Lake over the last decade

- providing much of the content of the socio-economic baseline, and validating that content, through community review of the baseline

- guiding the selection of VSECs, on the basis of both identification of issues and of AREVA`s specific VSEC inquiries in 2009 and 2010

- determining where emphasis lies in the discussion of the potential for Project effects – the assessment focuses on issues that the Inuit, government and stakeholders have said are important to investigate

- contributing to the assignment of criteria for effects and to the determination of significance for residual effects, which take into account both the relative values and the diversity of opinion that engagement has made evident

- incorporating into AREVA's socio-economic management for the Project mitigation and benefit enhancement measures that have been suggested by stakeholders

- emphasizing the importance of ongoing engagement and incorporation of IQ as important components of AREVA's socio-economic management for the Project

It is noted that with the submission of this DEIS, AREVA will organize a further sequence of open houses in each of the seven Kivalliq communities to validate the assessment conclusions and to solicit further suggestions on socio-economic (and environmental) management. Although AREVA considers that engagement results to date have been instrumental in guiding the content of the DEIS, such meetings are expected to result in additional input of relevance, input that will be incorporated in the final EIS.

4.8 INTEGRATION OF IQ

As described for engagement in Section 4.8 above, IQ has also been fundamental to all stages of the assessment, from developing baseline, to the identification of potential Project effects, to the development of socio-economic management measures in response, to the determination of significance of residual Project effects. IQ information is found in the results of primary socio-economic data collection, specific IQ data collection and engagement. All of these results were reviewed for IQ information of relevance to the socio-economic assessment.

Also as noted in Section 4.8, primary socio-economic data collection relies extensively on input of affected people in Kivalliq. The input from Inuit, IQ defined in its broadest sense, is the basis for the baseline's interpretation of the statistical data and its exploration of trends, challenges and opportunities related to socio-economic conditions in Kivalliq communities, and thus to the assessment of potential for Project effects.

Socio-economic management is only about achieving results – the avoidance or minimizing of negative effects and the enhancement of benefits for affected people. As such, both the assessment of effects and the development of socio-economic management take into account IQ related to past experiences, values that need to be respected, characteristic strengths and weaknesses, initiatives Inuit expect will facilitate their access to benefits and participation in the Project, and the responses of people to change.

There are two additional points to make with regard to the integration of IQ data. The first is related to language. Whereas among most in the younger generations were very able to talk in English about the land and its resources, and Inuit values and characteristics, there were important IQ data to be collected from unilingual Inuktitut speakers. Therefore care was taken during socio-economic and IQ data collection events to ensure that people were able to speak in Inuktitut where this was their choice, either directly to Inuit data collectors or through translators. Nevertheless, there are vocabulary and other translations issues that can lead to misunderstandings.

The second point is that people, including Inuit, vary widely in their perspectives. For example, there are differences in practices, knowledge and values between individuals, generations, genders and communities. This heterogeneity needs to be reflected in the discussion of the potential for effects and responded to through socio-economic management for the Project.

4.9 CONSIDERATION OF COMPARABLE EXPERIENCES

The unpredictability of socio-economic effects, irrespective of the quality of baseline data, engagement and assessment methods, suggests the value to the assessment of experiences in other (comparable) circumstances. This is somewhat challenging in northern Canada because socio-economic change has been rapid in recent years, and operations of mining companies have substantially evolved over time in response to regulatory requirements and community concerns. Thus strictly comparable experiences are difficult to identify. However, taken overall and accounting for differences in affected populations, timing, projects, effects, mitigation and benefit enhancement measures implemented, and incompleteness of socio-economic monitoring programs, there are some documented results that are of value in assessing the Project's socio-economic effects. Of particular relevance:

- In Nunavut: The Polaris and Nanisivik mines were developed 30 or more years ago, long before more recent best practice had been established as standard operating procedures for mines. However, there has been some thoughtful analysis of why these

mines resulted in few long term benefits for their nearest communities, Resolute Bay and Arctic Bay respectively.

- In NWT: The diamond mines provide a good point of comparison in terms of being more recent and having more aggressive benefit enhancement measures in place. There has also been a sustained effort over the last decade, between the Government of NWT (GNWT), BHP Billiton, Diavik and De Beers, to monitor the socio-economic effects of these mines, at the community level. The monitoring program has not been able to capture many clear cause and effect linkages between community socio-economic change and the diamond mines, but the monitoring results are instructive nevertheless. Although the affected people are not Inuit, there are some parallels insofar as communities are aboriginal, small, remote and socio-economically challenged.

- In northern Saskatchewan: AREVA cooperates with Cameco, agencies of the Government of Saskatchewan (GoS) and communities to monitor the effects of uranium mining on quality of life. The long standing proactivity of GoS in ensuring that mining brings benefits particularly to aboriginal communities in northern Saskatchewan has ensured that best practice has been adopted over a long period by the mines and that documentation of particularly employment, training and business benefits has been good. There is also a joint community monitoring process that is in place that is instructive.

A summary of lessons learned with regard to the above is provided in Section 7, Comparable Experiences. It is noted that Meadowbank, although newly operational, is also of high relevance. This project's effects are part of the socio-economic baseline for the Project and are reflected in engagement and IQ results. Lessons learned from Meadowbank are thus considered throughout this report rather than in Section 7 specifically.

5 SUMMARY OF EXISTING ENVIRONMENT

5.1 NUNAVUT

5.1.1 Government

Nunavut was formally created in April 1, 1999, and promptly set about a consultative process to set priorities and strategies for the economic and social development of the new territory. The work took into consideration a number of unique features of the economy and population, including the importance of the mixed economy, a requirement to use renewable and nonrenewable resources in sustainable ways that benefit the population, the value of IQ to planning and implementing government initiatives, consultative processes to give communities control of their own development, a need to develop self-reliance in face of overdependence on federal transfers, and a very young and rapidly growing population.

It was also recognized that there are significant challenges to improving the wellbeing of people. With a commitment to developing a more diversified economy, the government is faced with a need to address a broad range of constraints, from poor health and educational status of people, to lack of transportation and communications infrastructure, to limited information and data to be used for planning purposes, to uncertainties around the future role and contributions of the federal government.

The guiding document for government is Tampata 2009-2013 (GN, 2009). The document describes the vision for Nunavut to the year 2030, and notes that the vision is to be reached on the basis of Inuit values. The vision is that:

- `Nunavummiut will continue to have a highly valued quality of life and a much better standard of living for those most in need
- individuals and families will all be active, healthy and happy
- communities will be self-reliant, based on Inuit societal values, with reduced dependence on government
- Nunavut will be recognized for our unique culture, our ability to help one another and for our useful contributions to Canadian and global issues.' (GN, 2009)

Nunavut's economic (and social) development plans focus on the economic sectors that can provide the most growth and employment, without undue harm to the environment. These sectors are mining, tourism (and arts and crafts) and commercial fishing. To achieve growth in these sectors, investments are needed in education, small business development, transportation, energy and telecommunications. Most investment and employment growth is expected to come from the mining sector over the medium term – as of 2010 there were 85 active exploration and mineral developments in Nunavut (Nunavut Geoscience, 2011). Although there was no mineral production in 2008 or 2009, Meadowbank is now producing gold, Doris North has initiated construction and at least three other large mining projects are moving through the formal environmental review process, including the Project.

5.1.2 Economy

Nunavut's economy is mixed, combining land and wage based components – land based components include subsistence activity (harvesting animals and fish for household consumption, for example) as well as activity that generates income (trapping to sell pelts, production of arts and craft for sale, and guiding as examples). Most Inuit engage, or aspire to engage, in both land and wage based economic activities.

There are no good estimates of the value of the land based economy. In 2001 the Conference Board of Canada suggested a figure, based on a 'consensus of key informants', of $40 to $60 million as the value of the part of the land based component of the economy that did not include a financial transaction, that is, excluded pelt sales, tourism, sales of arts and crafts, the commercial fishery, environmental monitoring and communications (CBoC, 2001). Although none of these sectors is large, in aggregate the economic contribution is likely significant – tourism was estimated to contribute about $26 million to the economy in 2007 (GNDoF, 2008), arts and crafts about $33 million annually (GNDoEDT, 2010b), and the commercial fishery over $30 million[11]. It can be concluded therefore that in addition to social and cultural value, the land based economy plays a much more significant economic role than any available data suggest.

There is better data on the formal economy – that part of the economy that includes financial transactions[12]. In 2010, Nunavut's gross domestic product (GDP) was $1.633 billion in current dollars. Annual GDP growth rates have been highly variable, ranging from 10.6% in 2008 to negative 6.2% in 2009 – attributable to the small size of the economy and the consequent large

[11] This is not an official estimate, but is based on recently increased in quota, catches and approximate value as reported in various media.

[12] For the rest of this Section 5, most of the data on the formal economy comes from GN`s Department of Finance (GNDoF). Most of the data on the social context is from the GN's Bureau of Statistics (GNBS), Statistics Canada (Statscan) and Public Health Agency Canada (PHAC). Exceptions are noted. Full references are in Technical Appendix 9A, Socio-Economic Baseline.

effects of the economic shock of Meadowbank.[13] Government is responsible for much more of final domestic demand than in Canada more generally, for example, for about 40% of final domestic demand in 2008. However this does provide some stability in the economy in face of negative economic shocks. Business investment has risen rapidly, by over 500% between 2002 and 2008, largely attributable to investment in mining. Although business investment decreased substantially in 2009 with the completion of the construction of Meadowbank, gold production is increasing Nunavut`s exports and reducing the negative trade balance. Nunavut imports more than it exports – there was a trade deficit of over $1.2 billion in 2008.

GN revenue totaled $1.26 billion in 2010. Transfers from Canada's federal government represented 93% of GN revenue, with only 7% coming from own source revenue. The contribution of own source revenue is not expected to substantially increase over the coming decade. GN revenue growth is expected to average just about 6% annually between 2011 and 2020.

GN expenditures were $1.27 billion in 2010, with about 85% for operational expenditures and the balance for capital investments. GN budgeting is vulnerable to Government of Canada (GoC) decision making on transfer payments (up for renegotiation in 2014), the high proportion of the budget that is expended on non-discretionary entitlement programs and the cost of fuel. Government spends over half of its revenue on social services, including education, health, social assistance and social housing – only in part as a result of the challenging education, health, employment and housing status of the population. High costs for labour, construction, utilities and transportation (including between Nunavut and the rest of Canada), result in higher unit costs for government services (as well as for personal and business goods and services). Per capita GN spending is thus about three times that of Canada as a whole.

5.1.3 Social Context

Nunavut's population is over 33,000 as at mid-2011, of which about 85% are Inuit, distributed in 26 communities. The population growth rate averaged 1.8% annually between 1996 and 2009, about twice the rate for Canada – this is forecast to decrease to 1.3% in 2010 and then to 1.2% in 2020. Nunavut has had a fertility rate, of 2.97 children per woman in 2007, again almost twice Canada's rate of 1.66 in that year. The high birth rate has had the result that the population is much younger than Canada's population – in 2006[14] the median age in Nunavut was 23.1 years as compared to 39.5 years in Canada. Single parent (male and female) families were more common in Nunavut, at 27.6%, than in Canada, at 15.9% in 2006.

[13] Construction activity at Meadowbank peaked in 2008.

[14] Statscan data are cited where these are the only data available, but it is noted that these data often come from 2006. Statscan will release data from the census in 2011 over the period 2012 to 2013.

Nunavummiut are somewhat less mobile than Canadians in general – 90% lived in the same community over the five years previous to 2006 as compared to 80% of Canadians. The figures would be higher for Inuit – the 15% of the population that is non Inuit has very high mobility. Inuit would appear to be leaving the territory in larger numbers than they may be returning. Despite high birth rates, Nunavut was home to a smaller percentage of Inuit in Canada in 2006 than in 2001, while the rest of Canada has seen its Inuit population increase by a third.

Inuit culture remains very strong – in 2006, about 90% of Inuit 15 years and over had knowledge of Inuktitut, over 60% spoke Inuktitut in the home, over 70% hunted and fished, and 80% lived in households that shared harvested foods. There is however limited evidence of some erosion in traditional activity levels.

Adult education levels are low, well below Canadian averages. In 2006, 57% of the population 15 years and over had not graduated from high school and only 9% had a university degree. Available data suggest education levels are lowest in the younger adult age groups, however there are recent signs that this may be changing – Nunavut Arctic College (NAC) reported to the Nunavut Mining Symposium in 2011 that high school graduation rates had increased from 149 in 2000 to 228 in 2010 – growth of over 50% (NAC, 2011).

The unemployment rate in 2010 was about 15%. Despite some job creation, unemployment is expected to remain high as large numbers of the young grow old enough to enter the labour force.[15] The participation rate has increased from under 60% to almost 65% in recent years, suggesting that discouraged workers are reentering the labour force. To the extent that these additional workers do not find jobs, this also contributes to high unemployment rates. The employment numbers for Nunavut disguise the much higher unemployment rates for Inuit (over 20%) and the young (over 30%).

Per capita earnings were comparable to Canada, at almost $27,000 in 2006. Average wages at $58,088 for full year/full time work, were about 40% higher than in Canada, reflecting the much higher cost of living in Nunavut that is compensated by employers. Government transfers as a percentage of income were comparable between Nunavut and Canada, at about 11% of total income.

Health is defined as a state of complete physical, mental and social wellbeing, not merely the absence of disease or infirmity. The determinants of health are broad, and include socio-economic parameters such as income, education, environment, social support networks and

[15] 'Labour force' refers to the people of working age who are either working or looking for work, as opposed to 'work force' which refers to workers of a specific project or activity.

culture. The poor health status in Nunavut relative to the rest of Canada is a function of the interactions of many factors, including poverty and hunger, changing diets, substance abuse, smoking, and poor housing conditions, as well as consequent domestic violence (usually associated with alcohol), suicides and crime.

Suicide, substance abuse, smoking, teenage pregnancy, sexually transmitted infections (STIs), and life expectancy statistics in Nunavut are substantially worse than in the rest of Canada. For example, the suicide rate is six to eight times the Canadian average (and much worse than this for younger males) and life expectancy almost ten years lower. Outbreaks of infectious disease, including most recently tuberculosis, are frequent. Diabetes death rates are a fraction of Canadian averages however the incidence of diabetes is rising – health workers attribute this in part to changing diets and activity levels. Almost 70% of households, and half of children, are not food secure.

A comparison of health data by Inuit Tapiriit Kanatami (ITK) over the period 1996 to 2003 indicated that total mortality, cancer mortality and suicides rates had gone up in Nunavut and down in Canada and that life expectancy had gone down in Nunavut and up in Canada (ITK, 2010). The gaps between the health of the Inuit and that of people in the rest of Canada were in fact widening. Only rates of infant mortality had improved in Nunavut – however they were still much higher than in the rest of Canada. Public Health Agency Canada (PHAC) has some recent data that suggest, but do not demonstrate, that there may have been some improvements in health indicators since 2000. Rates of mortality, heart disease and suicide were lower in 2007 than in 2000.

Crime statistics are likely largely a reflection of health (particularly alcohol abuse) and economic challenges. Nunavut has particularly high rates of violent crime and sexual assaults relative to the rest of Canada. Crime figures suggest that total crime has increased since 2000, largely as a result of a doubling of non-violent crime rates.

Government is responsible to provide affordable (social) housing to Inuit in cases of need. Fifty one percent of houses are social housing, 22% of houses are privately owned and almost all of the balance is staff housing provided by public and private sector employers. Housing conditions are challenging and many of Nunavut's education, health and wellbeing weaknesses are attributed at least in part to poor housing conditions – 49% of houses are overcrowded and/or in need of major repair. GN estimates unmet demand for housing at over 3,500 units, equivalent to almost 40% of current housing stock.

There are no roads connecting any of the 26 communities in Nunavut, nor any roads or railways connecting the territory to the rest of Canada. For many years, there has been discussion of constructing a road between Winnipeg and Rankin Inlet however costs would be very high. Aside from travel on the land and sea, usually by all-terrain vehicles and small boats, travel is almost exclusively by air for passengers and some goods, and by summer sealift for most goods. All Nunavut communities have scheduled flights and there is service through regional hubs to points in southern Canada

5.2 KIVALLIQ REGION AND COMMUNITIES

One of three regions in Nunavut, Kivalliq shares many of the socio-economic characteristics of Nunavut as described above, but has historically been somewhat disadvantaged relative to the territory as a whole. Baseline information for Kivalliq and its seven communities comes from:

- socio-economic and IQ studies done in all communities in Kivalliq, between 2009 and 2011 – including 23 discussions with groups of women, elders, hunters, rotational workers and others, 72 interviews with individual health and education workers, social counsellors, hamlet government representatives and others, and a survey using questionnaires at 89 households in Baker Lake, on traditional harvesting, associated values and consumption of country food

- the result of hundreds of consultations on the Project done by AREVA over the years of Project development, to mid-2011

- statistics and reports prepared by the governments of Nunavut and of Canada, mining companies, consultants and researchers in Nunavut

5.2.1 Economy

As for Nunavut, the economy of Kivalliq is mixed, combining both land and wage based components. Although the land based economy is not well captured statistically, it continues to provide economic, social and cultural benefits. Country foods represent an important element in the diets and livelihood strategies of about two thirds of the population. There are also significant cultural dimensions to land based economic activities – the harvesting, distribution, processing and consumption of traditional resources affirm identity and social relationships among the Inuit.

Most individuals are active in both the land and wage based components of the economy. There is a continuum, along which harvesting, arts and crafts, guiding and wage based employment lie, and along which individuals operate as they engage in a range of economic activities. It is in this sense that the economy is mixed, and distinguished insofar as the goals of economic activity are nuanced – earning money is not always the only objective of economic activity, but rather people also seek to maintain traditional activity and associated social and cultural benefits towards individual and community identity and wellbeing.

AREVA data from the household survey done in Baker Lake indicate that despite concerns about the relationship between wage employment and levels of land based economic activity, there is no evidence that the latter has declined in Baker Lake over the last decade as a result of Meadowbank. Land based economic activity remains highly valued and the number of hunters is stable as compared to the pre Meadowbank years. Consumption levels of caribou and fish remain unchanged, and there is some evidence of increased diversity, in small

amounts, of consumption of other traditional foods. Results disaggregated between people employed for more than six months and people employed for six months or less show some evidence of increased participation in traditional activity by the more employed. The more employed have the cash needed to fund land based economic activity and workforce management ensures that people also have the time they need to go out on the land.

With regard to wage based economic activity, government is the largest employer. Government regards mining and tourism as the two sectors of most potential to contribute to economic development in Kivalliq and, critically, employment. Kivalliq's land use plan emphasizes that development is to be achieved in a context of balancing increased opportunities for wage labour, particularly for youth, with environmental protection and maintenance of cultural integrity.

Business is not strongly developed in most Kivalliq communities; however there is increasing capacity to supply the mining sector, primarily in the regional hub of Rankin Inlet and now in Baker Lake. This has been in response not only to the construction and operations of Meadowbank, but also to the many ongoing exploration activities. Available goods and services include logistics, camp operation, drilling, construction, fuel supply and environmental monitoring.

The Kivalliq Chamber of Commerce represents 80 companies, although most of these remain small and consumer oriented. Business development is constrained by small local markets, remoteness and shortages of investment and skilled staff. Sakku Investment Corporation, in Rankin Inlet, is the business arm of the KIA and is owned in trust by the Inuit of Kivalliq. The corporation's mandate is to invest, often in partnership with companies based elsewhere in Canada, in viable enterprises in Kivalliq. Increasing Kivalliq's capacity to supply the mining sector is a priority, in part to create alternative employment for Inuit who are unable to access jobs with mining companies directly.

5.2.2 Social Context

Kivalliq's population is estimated to have grown from 7,944 to 9,479 people between 2001 and mid-2010, for an average annual growth rate of 2.0%. Table 5.2-1 shows the variability in population sizes and growth rates in the seven communities. Arviat, Baker Lake and Rankin Inlet are the largest communities, with populations over 1,900, while the other communities have populations under 900. The fastest and slowest growing communities were Repulse Bay and Chesterfield Inlet respectively. There had been no significant acceleration of population growth in Baker Lake in response to Meadowbank by 2009 but population grew by 2.4% between 2009 and 2010, faster than Baker Lake`s longer term average population growth rate. Rankin Inlet`s population grew by 2.2% between 2009 and 2010, also faster than the average has been.

Population growth rates have slowed recently and GN's projections are that regional rates will be 1.6% to 1.8% over the foreseeable future, still quite a bit higher than projected growth rates

in Nunavut overall. The labour force will continue to grow even more rapidly than this however, as the 35% of the population below 15 years enters the labour force. The young will present employment challenges in the absence of job creation, however also have potential to become a driver of economic growth provided they are able to develop the skill sets needed, and have the incentives, to access economic opportunities.

Table 5.2-1 Population

	2010 Population	Annual Growth Rate, 2001 to 2010
Arviat	2,331	2.0
Baker Lake	1,950	2.2
Chesterfield Inlet	386	0.8
Coral Harbour	861	1.8
Rankin Inlet	2,704	1.8
Repulse Bay	855	3.2
Whale Cove	392	2.0
Kivalliq	9,479	2.0
Nunavut	33,220	1.9

Source: GNBS, 2011b

Table 5.2-2 provides selected data on Kivalliq and its communities, as well as on Nunavut as a whole for comparison purposes. The population is 90% Inuit and more than 80% does not have English (or French) as a mother tongue. It will be noted that Kivalliq's indicators often lag those in Nunavut. There is a high percentage of female headed households (at over 27%), whose incomes are half the regional average for all families. The availability of quality of housing remains a major challenge. There is significant variability between communities, particularly with regard to median incomes which are, for example, twice as high in Rankin Inlet as in Repulse Bay. Rankin Inlet is also distinguished by the highest median age, the fewest dwellings in need of repair, and a large non Inuit population.

Education levels compare unfavorably to those in Nunavut as a whole. Kivalliq residents are less likely to have completed secondary or post-secondary education – 65% of the adult population has not completed high school. Variability between communities is high, and Rankin Inlet has the best performance. Detailed education statistics suggest that educational achievement is lowest in the younger age cohorts, those under 35, and that in this age group women are beginning to outperform men. Even more so than for Nunavut as a whole, high school graduation rates are improving more recently – in 2010 Kivalliq had twice the high school graduates as compared to ten years ago. Nevertheless, there are still significant challenges in

getting many children through high school, attributed to a multiplicity of causes, including, but not restricted to, overcrowded housing, teenage pregnancy, English language difficulties, a shortage of Inuit teachers and poor employment prospects.

Table 5.2-2 Selected Socio-economic Indicators (2006)

	Arviat	Baker Lake	Chesterfield Inlet	Coral Harbour	Rankin Inlet	Repulse Bay	Whale Cove	Kivalliq	Nunavut
Average household size	4.5	3.8	3.2	3.9	3.6	5.6	3.9	4.0	3.8
Median age of the population	19.5	22.0	24.0	18.9	23.9	18.9	19.1	21.1	23.1
Dwellings requiring major repair (%)	28.6	26.7	45.0	20.5	13.0	35.7	38.9	24.8	20.2
Percent of female lone-parent families	29.1	29.6	29.4	26.5	25.7	20.6	31.3	27.1	20.5
Median income, all families ($)	37,248	39,360	51,072	38,144	66,133	28,224	36,736	42,368	49,270
Median income, lone parent families ($)	17,984	21,312	21,376	21,632	27,296	10,592	24,384	21,248	22688
Aboriginal identify population	93.2	90.7	90.8	95.5	83.7	95.3	95.8	90.4	85.0
Mother tongue English	6.6	34.6	14.1	5.9	28.6	6.0	2.9	18.6	26.5
No certificate; diploma or degree, persons 15 years and over	70.6	66.4	61.0	66.3	53.4	80.9	77.5	64.5	57.3
University certificate; diploma or degree	5.6	6.3	4.9	3.3	8.9	3.4	0.0	6.4	9.0
Participation rate	49.8	59.2	74.4	66.7	71.7	61.1	47.6	61.7	65.3
Unemployment rate	13.0	18.9	15.6	19.4	10.2	34.5	10.0	15.7	15.6
Median income, all families ($)	37,248	39,360	51,072	38,144	66,133	28,224	36,736	42,368	49270
Median income, lone parent families ($)	17,984	21,312	21,376	21,632	27,296	10,592	24,384	21,248	22688
Government transfers, as % of total income	17.3	19.4	12.3	21.1	7.5	26.3	17.1	14.2	11.2

Source: Statscan, 2007a

It is cautioned that the data in Table 5.2-2 are from 2006, and therefore do not reflect the socio-economic changes consequent on Meadowbank, particularly those related to employment, income, educational achievement and housing, in Baker Lake. Whereas between 2006 and 2008 incomes fell across Kivalliq (by between 0.1% in Rankin Inlet and by 18% in Coral Harbour), in Baker Lake incomes had increased by about 12%. Unemployment rates in Baker Lake are reported to have decreased – although there are no available unemployment rate data, as of mid-2010 Meadowbank employed about 10% of the Baker Lake labour force in that year. Rates of high school graduation and movement out of social into private housing are also said to have increased.

Governments are increasingly reluctant to publish health data, particularly for small communities, largely on confidentiality grounds. The most recent disease incidence data are only available at the territorial level, as summarized in Section 5.1.3. Health staff in Kivalliq communities report facing the same challenges that are evident at the territorial level, with some variations. For example, suicide is not believed to be as acute a problem in Kivalliq as it may be elsewhere in Nunavut, although is still of concern.

There are some community level data on perceptions of health, self-reported as part of census studies specific to aboriginal populations. The evidence is that Kivalliq residents are less likely to see a doctor and but also, as of 2006, less likely to have long term health conditions than people elsewhere in Nunavut. Despite what experts consider to be comparatively poor health status among Inuit, most people regard their health status as good to excellent, although this may be less true more recently.

Nunavut has had some success in ensuring that education and health facilities are available in all communities. The depth of service suffers in many cases, as small populations do not create constant demand for more specialized services. Even a community as large, comparatively, as Baker Lake sees most types of health professionals, other than nurses and social workers, only on a visiting basis. This includes doctors, mental health workers and dentists. These visits are supplemented with video teleconferencing and a large percentage (20%) of the operating health budget is used to bring people to services, where local services are lacking.

Cultural integrity is a very important component of individual and community wellbeing. The practice of traditional culture gives people identity and social roles, and protects more vulnerable people by providing food. It is very clear that livelihoods have changed enormously over the last 60 years. Only the oldest people in Kivalliq have experience of living as adults on the land. New technologies, including snow machines and outboard motors, are now used to harvest but have high costs, making wage labour more necessary.

Traditional culture also provides guidance for people's social roles. Family and community ties are maintained through sharing of country food but also other sharing, of harvesting equipment and knowledge for example. Traditional celebrations demonstrate recognition and emotional support for people's achievements. Activity on the land keeps skills alive and reinforces Inuit values. Increasing contact with southern culture, with different values, and a perceived need on

the part of many to work and learn within that culture, is forcing change. Some people may feel that their social obligations interfere with their goals for advancing in a new economic environment. People also speak about the misunderstandings between generations that has come with the introduction of southern people's values and material goods. Traditional life also meant people had clear gender roles, which may be breaking down.

High crime reduces community wellbeing. Kivalliq has much lower crime rates than Nunavut as a whole (with the partial exception of Rankin Inlet), but rates are still much higher than in Canada. Violent crime is not increasing but total crime is. Crime rates are lower in the smaller, more traditional communities as compared to Arviat, Baker Lake and Rankin Inlet. In all Kivalliq communities, police point to alcohol abuse as the biggest contributor to violent crime. There are many explanations for increasing total crime. Poverty and substance abuse are important factors but it is also likely that cultural change is also part of the explanation.

Housing is an ongoing problem in Nunavut, but is worse in most Kivalliq communities. More than half of houses are overcrowded and/or in need of major repairs. GN provides most housing. But there are high costs for house construction and maintenance. About 40% of people in Kivalliq would move if they could. Poor housing conditions, particularly overcrowding, are regarded by health staff as a major contributor to infectious disease outbreaks. The high demand for housing will continue to increase as the young grow older – more people will decide they want to live in their own houses rather than with their families.

Rankin Inlet is the Kivalliq hub, with scheduled air service to all other Kivalliq communities and to Iqaluit, Yellowknife, and points in southern Canada. Rankin Inlet is also a regional service centre, home to the KIA, Sakku Investment Corporation, various territorial government offices, a NAC campus and trade school, Kivalliq's only hospital, a chamber of commerce, two banks and a range of businesses.

All Kivalliq communities have schools to grade 12, health centres, police detachments, diesel generated power, docking facilities, recreational/community buildings, multiple churches and municipal services, including trucked water (only in Rankin Inlet is water piped) and sewage services. All communities have mail, phone, television, radio and internet services and there is a regional bilingual weekly newspaper. All communities have at least a Northern Store or a Coop, which sell groceries, clothing and a range of other consumer goods such as electronics, furniture and snow machines. Mental health, birthing, and elder and child care facilities are constrained in most communities and many people feel that more recreational facilities are badly needed, particularly for the young.

6 SOCIO-ECONOMIC MANAGEMENT

6.1 AREVA CORPORATE STANDARDS

AREVA's corporate standards are aligned with those of its parent company, the AREVA group. The vision is that AREVA is committed to being a leader in uranium mining. For AREVA this means a long term commitment to sustainable development by balancing economic, social and environmental performance. The mission is that AREVA produces high quality uranium concentrate in an environmentally and socially responsible manner to help meet global energy needs. AREVA recognizes its obligations as a leading uranium mining company, commits to the sustainable development of its entity, and commits to all aspects of its business being managed in a safe, healthy, efficient, economical, socially and environmentally responsible manner (AREVA, 2011).

The vision, mission and commitments are reflected in AREVA's ten business principles, all of which – with the exception of customer satisfaction – have some relevance to socio-economic management:

- `Governance: Manage our operations responsibly in accordance with the group's values, assess and truthfully report on our performance to shareholders and all stakeholders
- Continuous improvement: Implement a continuous improvement initiative based on practices shared throughout the AREVA group
- Economic performance: Ensure the group's sustainability through long-term profitable growth
- Innovation: Develop and harness best-in-breed technologies to anticipate customer needs and increase our cost-competitiveness while complying with nuclear safety, occupational safety and environmental protection requirements
- Customer satisfaction: Listen to our customers, anticipate their needs, support their growth, and increase and measure their satisfaction
- Commitment to employees: Promote our employees' professional development and provide good working conditions

- Risk management and prevention: Establish and maintain the highest level of nuclear and occupational safety in all of the group's operations to preserve public and worker health and protect the environment

- Environmental protection: Limit our environmental impacts by reducing our consumption of natural resources, controlling our releases and optimizing our waste management

- Dialogue and consensus – building: Establish stakeholder relationships based on trust

- Community involvement: Participate in the economic and social development of the communities in which the group operates.' (AREVA, 2011)

6.2 APPROACH TO SOCIO-ECONOMIC MANAGEMENT

6.2.1 Objectives

The main objectives of AREVA's socio-economic management for the Project are to:

- mitigate the negative effects and enhance the benefits (creating value) of the Project for all Project affected people and other stakeholders

- create opportunities for people in Kivalliq and Nunavut more generally to participate in the Project, thereby enhancing self-reliance, wellbeing and sustainability

- establish a role for AREVA as an active participant in the sustainable development of communities in Kivalliq and of Nunavut more generally

- maintain goodwill and good relations with people and their governments

6.2.2 Principles

The following principles have guided the development of socio-economic management measures and will guide ongoing socio-economic management by AREVA, including support for economic and social development:

- Communities and people most likely to experience negative effects of the Project receive priority in the distribution of Project benefits.

- The implementation of effect mitigation and benefit enhancement measures is undertaken in partnership not only with affected people, but also with a range of organizations from government and civil society that are able to bring appropriate

experience and knowledge to maximizing net socio-economic benefit while protecting the interests of more vulnerable subpopulations.

- Engagement (both consultation and participation) has been and will continue to be practiced throughout the Project life cycle to define people's priorities and to decide as necessary how effect mitigation and benefit enhancement measures will be adjusted, implemented and monitored (adaptive management).

- IQ is solicited, documented and integrated into Project decision making.

- Planning and implementation of effect mitigation and benefit enhancement measures take into account normal Project activities, such that synergies can be identified towards increasing the efficiency and effectiveness of socio-economic management. The strengthening of entrepreneurial skills towards developing capacity to supply the Project, and possibly other mines that might be developed nearby, is an example.

- Planning and implementation of effect mitigation and benefit enhancement measures is conducted in an environment of accountability and transparency. This implies public reporting on results of socio-economic management, as well as facilitating access to AREVA on the part of people and their governments in the event that unforeseen negative effects occur, or grievances develop.

- Sustainability criteria are incorporated in decisions on effect mitigation and benefit enhancement measures by considering:

    - demonstrated demand for the measure

    - people's willingness to participate in the development and implementation of the measures that imply their participation

    - people's culture, expectations, basic needs and vulnerabilities

    - changes that will occur with closure such that measures do not depend on contributions by AREVA over the long term

    - consistency with government planning and programming

6.2.3 Socio-economic Management Components

For the Project, AREVA approaches socio-economic effect mitigation and benefit enhancement under six broad categories as follows:

- Project design choices made for particular Project components in order to reduce the potential for negative effect: Design choices for the Project are more fully described in Technical Appendix 2A, Alternatives Assessment.

- The implementation of good practice corporate policies and procedures that reduce the potential for negative effect and/or enhance the potential for benefit: This would include, for example, the application of traffic safety rules for drivers and workplace health and safety plans. Such good practice is characteristic of AREVA and is captured in corporate statements as well as in the environmental and socio-economic mitigation and benefit enhancement measures described throughout this DEIS.

- The implementation of measures to address Project specific socio-economic effects that are well defined, are at least somewhat predictable in their significance and are susceptible to mitigation or enhancement by AREVA: This would include, for example, measures to prioritize Kivalliq's access to Project economic opportunities and to accommodate traditional culture in workforce management. Specific socio-economic effect mitigation and benefit enhancement measures are summarized in Section 6.3 below.[16]

- Ongoing information disclosure and engagement with people and their governments: Engagement, including the seeking out of IQ, throughout the construction, operations, final closure and post closure phases of the Project achieves multiple objectives, including contributing to the effectiveness of effect mitigation and benefit enhancement measures. The integration of engagement and IQ into socio-economic management is summarized in Section 6.4 below.[17]

- Monitoring: Monitoring contributes to demonstrating Project benefits and provides evidence of compliance with EIS undertakings. In addition, monitoring furthers the understanding of the effectiveness of effect mitigation and benefit enhancement measures and provides a mechanism to capture any unpredictable and/or evolving effects, such that socio-economic management can be adjusted. AREVA's monitoring includes significant participation in monitoring activity by communities in Kivalliq. Engagement is integral to monitoring. Monitoring is described in Section 6.5 below.

[16] Fuller details on these measures are provided in Technical Appendix 3C, Community Involvement Plan and Technical Appendix 9C, Human Resources Development Plan.

[17] Fuller details on these measures are provided in Technical Appendix 3C.

- The planning and implementation of activities in support of economic and social development: This is largely, but not exclusively, affected through the IIBA,[18] and addresses:

    - negative socio-economic effects that are difficult to completely mitigate, such as the potential effects of labour force competition on community service delivery and on businesses

    - negative socio-economic effects that are unpredictable in their significance and/or may evolve as the Project proceeds, such as negative effects on communities that may result from migratory movements

    - socio-economic benefits that can be enhanced with some assistance directed at people such that they are better positioned to access Project and other economic opportunities over the longer term – the implementation of school based education programs is an example

    - regional economic and social development objectives

  The current status of the IIBA negotiations is described in Section 6.6 below.

Finally, it is noted that the components of the socio-economic environment that the Project might be expected to affect are of interest and/or concern to governments and other organizations, which have innumerable policies, programs and projects in various stages of planning, implementation and adjustment. Many of these will contribute to mitigating any negative Project effects and to enhancing Project benefits. This is briefly addressed in Section 6.7.

6.3 MITIGATION AND BENEFIT ENHANCEMENT MEASURES

Because socio-economic effects are so interrelated, and in some cases cascade, it is not practical to present measures specific to each effect identified in Sections 8 through 13, Assessments of Effects. As an illustration of the complexities:

- One measure can be expected to affect the outcome of a number of different effects. For example, preferential employment policies (to increase the numbers of Inuit working for

[18] AREVA has initiated IIBA discussions with the KIA and expects that parts of the IIBA will be available for disclosure at the time of the submission of the final EIS to NIRB.

the Project) can be expected to increase individual, community and territorial economic activity and incomes, but should also build capacity to participate in the wage based component of the economy over the longer term, provide resources for traditional activity, reduce demand for government services and contribute to overall community wellbeing.

- One effect can be expected to be affected by a number of different effect mitigation and benefit enhancement measures. For example, incomes can increase as a result of preferential employment, preferential contracting, training and other measures intended to enhance job performance, and over the longer term as a result of school based programs intended to keep children in school.

Effect mitigation and benefit enhancement measures are therefore discussed below by category of measure rather than by the effects they are expected to address.

6.3.1 Employment

AREVA's employment policy is to maximize employment of people in Kivalliq communities, with the intent to see that Project benefits accrue not only to the Nunavut and Canadian economies, but also to the people of Kivalliq. Such a policy implies that where people have little experience with the mining sector, Project specific initiatives can be required to address barriers to employment. It is noted however that to operate effectively, efficiently and safely, AREVA's requirement, as a nuclear facility, is for a comparatively skilled workforce.[19]

It is important to segments of the population that wage employment not conflict with traditional activities and practices that are both economically and but also socially and culturally critical to livelihoods and individual, family and community wellbeing. There can be limits to people's preparedness for the challenges of rotational work. Under representation in a rotational workforce by women can be for lack of opportunity (due to family responsibilities or for other reasons) rather than lack of desire to participate. Cross cultural challenges can represent a disincentive to participation. Only a few jobs at the mine will require less than a completed high school education. There are therefore real barriers, and different ones for different people, to employment with the Project for some people in Kivalliq.

Initiatives that will be put in place to enhance employment through human resource policy and procedures are identified below. (Education and training initiatives to enhance employability are addressed in Section 6.3.3.)

[19] Nuclear facilities in Canada are held to high standards by the CNSC, including standards related to the education, training and safety performance of workforces.

- maintaining a regularly updated database of potential Kivalliq employees and preferentially hiring people from Kivalliq where qualifications and experience permit, during both construction and operations – a second priority is people from the other regions of Nunavut – and sharing this database with contractors and other mining companies

- including in points of hire all seven Kivalliq communities, and funding air transport to and from the mine site from these points of hire, to enable Project employment without a need for people to move from home communities to access jobs

- providing to Kivalliq communities and the KIA full, timely and easily accessible information in English and Inuktitut on workforce requirements, job descriptions, qualifications and performance criteria

- during construction, setting annual Inuit employment targets on a best effort basis, at least at 10% of the total workforce,[20] consistent with Project skill requirements, with job and training interests and performance, and with health and safety standards

- during operations, similarly setting annual Inuit employment targets, initially at least at 25% of the total workforce – targets would be expected to grow with time to at least 50%

- reviewing educational and training requirements for Project positions and conducting prior learning assessments, with a view to accepting experience in lieu of qualifications where this is acceptable within legal and regulatory frameworks for uranium mining

- enabling the use of Inuktitut at Project work sites where health and safety standards permit – the identification of positions accessible to Inuit with limited English language skills and the development of Inuit supervisors to lead Inuit work groups are examples of initiatives that enable the use of Inuktitut

- designing recruitment methods, advertisements, application procedures, interview protocols, selection procedures, and training and promotion decision making to reduce artificial barriers, including language barriers

[20] AREVA proposes modest targets for purposes of thisD EIS as there are uncertainties about the labour market in 2017 forward. It is noted however that a 20% to 25% has been characteristic of the construction phases of other large projects in Nunavut.

- providing informal counseling at the mine site – employing elders to have one at site at all times, and identifying and training peer counselors, to assist workers to meet the challenges of the rotational work schedule and working conditions are examples

- putting in place a culturally appropriate employee and family assistance program (EFAP) to address individual and family problems that threaten an individual's ability to continue working

- conducting exit interviews with a view to increasing the understanding of barriers to successful long term employment, and integrating the results into other initiatives as relevant

- providing cross cultural training to all employees in order to facilitate the integration of Inuit employees into the workforce

- providing culturally appropriate services to workers, including recreational facilities, food and accommodation, country food storage, an Inuit worker site harvesting policy, English as a second language training, translation services, and work schedules that accommodate to the extent practical traditional activity (see Section 6.3.4)

- training on and enforcing policies related to personal firearm use, vehicle operation, controlled substances, alcohol and harassment, towards establishing the workforce discipline which encourages health, safety, learning, retention and advancement of Inuit employees

- providing recrimination free opportunities for workers to express complaints or concerns, and bring to light conflicts such that grievances are addressed promptly

- maintaining a safe workplace for women workers, who can face unique challenges, and on a case by case basis, providing additional support to women applicants and employees to enhance the potential for employment success

- regularly reviewing, at least bi annually, the results of such initiatives in order to identify barriers to employment for particularly women and challenged workers such that appropriate additional responses can be developed

- including in the evaluation criteria for contractors the extent to which they commit to similarly prioritize and enhance the use of Kivalliq labour in meeting their contractual obligations and using this criterion in decisions on contract awards

- monitoring contractor performance for compliance with their commitments and using monitoring results in decisions on contract administration and management

6.3.2 Contracting

As for employment, AREVA's policy is to maximize opportunities for businesses in Kivalliq to access opportunities to provide goods and services to the Project, again in the interest that Project benefits accrue not only to the larger national and regional economies, but also to the economy and people of Kivalliq. Such a policy implies that where local businesses have little experience with the mining sector, Project specific initiatives may be necessary to remove barriers to successful bidding on procurement contracts.

Although there are now a growing number of exceptions, most businesses in Kivalliq, and particularly in the four smaller communities, are largely geared to meet the consumption needs of the resident population rather than the needs of large mining projects. There is thus limited experience with the management and logistics of procurement, including preparing offers of goods and/or services. Many businesses are small, and do not have the breadth or the financial resources needed to bid on large contracts. They have limited experience with the exigencies of supplying large, time sensitive operations and limited experience with quality control.

Initiatives that will be put in place to enhance opportunities for businesses to supply goods and services to the Project are identified below.

- staffing two business development positions, with responsibilities to increase Kivalliq business participation in the Project

- maintaining a regularly updated database of potential Kivalliq suppliers[21] of goods and services that identifies businesses interested and with some capacity to supply the Project, noting Inuit content of the business, coordinates and contacts, goods and/or services on offer, updates on contract performance, requests for assistance to improve supply performance and any assistance extended in support – this database will also be shared with contractors and other mining companies

- during construction, setting annual Inuit contracting targets on a best effort basis, at least at 20% of total contracting, consistent with Project goods and service requirements relative to the capacity to supply and with competitiveness and cost effectiveness considerations

[21] 'Kivalliq suppliers' are expected to be defined in the IIBA as will a formula for calculating 'Inuit content'. Factors taken into account are expected to include i) location of head office; ii) degree of Inuit ownership and participation in business profits; iii) proportion of Inuit employees; iv) proportion of Inuit wages; and/or v) proportion of inputs from other Inuit firms.

- during operations, similarly setting annual Inuit contracting targets, initially at least at 30% of the total contracting – targets would be expected to grow with time[22]

- providing to the KIA, business associations and the business community, in English and Inuktitut, full and timely information on procurement requirements in agreed areas of capacity to supply on the part of existing and/or potential businesses (including for example, road construction and maintenance, accommodation, catering, janitorial services, trades work, materials handling and expediting, cross cultural and other training, light vehicle maintenance, warehousing, secretarial services, air services and/or environmental and socio-economic monitoring).

- establishing a contracting policy that requires, for any contracting opportunity in agreed areas, first inviting Kivalliq businesses with capacity to supply to submit proposals, entering into good faith negotiations with proposing businesses, and then only in the event of no success, moving to bidding to the open market – this may necessarily include sole sourcing in some instances

- developing contracting procedures that take into account potential needs to break down procurement packages, waive financial guarantees, implement early payment procedures or otherwise facilitate the participation of smaller businesses

- providing to any business that may be denied an opportunity to bid for reasons of determined lack of capacity or unsuccessfully competes on a goods or service contract an explanation for the weaknesses in its offer

- participating with the KIA in development and support for training programs for existing and potential entrepreneurs that will contribute to their success rates at offering goods and services to the Project and to the broader market

- identifying synergies between the Project and Kivalliq businesses and facilitating businesses to access these, for example through making available Project infrastructure and/or excess transport capacity for businesses' Project and non Project related use

- working with Kivalliq businesses as interest and opportunities warrant to facilitate forming of joint ventures with southern Canada businesses that have expertise in supplying the uranium mining industry

[22] It is noted that in recent years, capacity of Inuit businesses to supply the mining sector has grown rapidly in response to Meadowbank and heavy exploration activity in Kivalliq. These targets are based on current experience of what is achievable. As businesses continue to gain experience over the coming five to ten years, higher targets may be set as AREVA begins construction, and then operations.

- including in the evaluation criteria for contractors the extent to which they commit to similarly prioritize use of Kivalliq businesses in meeting their contractual obligations and using this criterion in decisions on contract awards

- monitoring contractor performance for compliance with their commitments and using monitoring results in decisions on contract administration and management

6.3.3 Education and Training

AREVA wishes to enhance the potential on the part of people in Kivalliq to access employment and contracting opportunities created by the Project. Thus AREVA will provide Project related education and training programs. However, AREVA also recognizes that poor educational achievement contributes both to lack of economic opportunity generally, and to social challenges that are the consequence of unemployment and poverty. There is also concern, particularly among elders, that traditional knowledge is being lost to communities and youth.

The promotion of education and training is therefore intended to address not only Project requirements, but also to contribute to longer term participation in both the wage and traditional economies in the interests of sustainable development. Accordingly, AREVA will work with the KIA, education authorities in Kivalliq and other mining sector companies, to develop the detail of an education and training strategy that is broader based in its goals than simply meeting Project related needs. Elements of the education and training strategy include:

- providing timely and accessible information to Kivalliq communities on all Project related education and training opportunities

- providing pre-employment training to promising job candidates, in order to enhance the potential for success once employed, in such areas as work readiness, life skills and personal financial management

- establishing a total of 120 full time education and training positions[23] for Inuit at Nunavut educational institutions and at AREVA operations in Saskatchewan, in preparation for the operations phase, including in heavy equipment operations, mill operations, apprenticeship and technician training, technology, radiation, environmental monitoring and computer and office skills

[23] These training positions will be for different time periods, from one to four years, depending on the nature of the training.

- providing on the job training in areas such as orientation to AREVA operations, health and safety, English language and skills upgrading (core competency), supervision, leadership and management to enhance job performance, retention and advancement

- providing on the job training and counseling as appropriate in areas such as career development, diversity and respectful behaviors, life skills, and personal financial management to support successful employment experience

- including in the job responsibilities of more senior staff the requirement to mentor more junior staff such that they may advance – training in how to coach and mentor will be provided where staff require this to meet succession planning objectives

- retraining selected construction workers for operations phase jobs and operations workers in new required skills (for example, for underground mining when this starts) to allow successful employees to continue their employment as work force needs shift

- supporting efforts on the part of employees to upgrade their education as a means towards job advancement – high school completion programs, with a qualified teacher, will be offered at the mine site is an example of such supportive efforts

- cooperating with appropriate agencies in Nunavut in entrepreneurial training programs for Inuit businesses – this training will address health and safety, business skills (finance and administration), quality control and legal/contracting issues

- cooperating with appropriate educational authorities and institutions in Nunavut in the development and implementation of high school and college courses with mining sector content

- providing summer employment programs and cooperative education opportunities at the mine site to provide job experience to the young

- working with other mining sector organizations in the region to enhance education and training strategies across the sector through sharing of best practice experience and resources

- providing a ‘stay in school’ fund – for school based career counseling, stay in school workshops, mentoring and achievement awards – to encourage students to stay in school and to support them in this decision

- providing a scholarship fund for post-secondary education – eligibility would include both high school students and Project workers

- participating with schools to deliver youth programs intended to develop traditional skills, particularly those related to activity on the land, and to address the management of mixed economy livelihoods

6.3.4 Workforce Management

Workforce policies are intended to ensure that Inuit employees are equitably compensated, have opportunity to engage in traditional activity and practices and are provided workplace conditions that accommodate Inuit culture. In addition, the intent is to minimize the contact between the residents of Kivalliq communities and out of area Project workers and to guide appropriate behaviors in communities when the necessary contact does occur. Finally, workforce management measures can contribute to limiting intercommunity migration in search of employment. Workforce management measures will include:

- staffing positions in each of the seven Kivalliq communities with responsibilities to facilitate not only job applications and expressions of business interests, but also meeting workers' needs for assistance as they transition between home and work

- clearly communicating in information materials distributed by the Project and in advertisements for job openings through other media (i.e. radio and newspapers), the preferential employment policy, points of hire and terms of employment, as well as instructions to interested applicants on how to apply for jobs from their home communities to limit speculative in migration to Baker Lake

- establishing an accommodation camp at the mine site to house all workers while on rotation and providing return transportation to home communities

- providing at the accommodation camp facilities to meet workers' first response health needs while at site, including physical and mental health services, with no requirement for regular recourse to Baker Lake or Rankin Inlet health facilities

- establishing fly in, fly out schedules that see employees removed from the mine site directly to their home communities, with any necessary restrictions on provided transport services to minimize worker presence in Baker Lake or Rankin Inlet

- iteratively developing and implementing, in consultation with Inuit workers, human resource management policies and procedures that respond to particularly Inuit workforce challenges – absenteeism and unexpected resignations (and subsequent

reapplications for employment) on the part of workers creates substantial operational difficulties for a large mine but can at least be in part addressed by various adjustments to accommodate needs of both AREVA and its workers[24]

- establishing and enforcing a code of conduct guiding the behaviors nonresident workers while working in or travelling through Baker Lake, Chesterfield Inlet and Rankin Inlet particularly but also other Kivalliq communities

- including in the code of conduct i) standards for behaviors in support of good community relations and sustainable development; ii) prohibitions against illegal activity, harassment, verbal and physical abuse, negligence in driving company vehicles and other behaviors that may be identified by people in communities as offensive or problematical; and iii) sanctions to be applied in the event of noncompliance with the code

- cross cultural training of all employees to encourage mutual understanding and respect in interactions of Inuit and non Inuit employees

- establishing Inuit and non Inuit harvesting policies, including sanctions – whereas non Inuit will not be permitted to hunt or fish while at the mine site, Inuit rights in this regard will be respected

- facilitating the use, as appropriate, of the Inuktitut language in the workplace, including the translation of mining related terminology into Inuktitut such that people are able to discuss their experiences both in the workplace and at home in their own language

- payment of salaries commensurate with costs of living (taking into account changes to eligibility for assisted housing and other government benefits) and benefits packages that recognize social and cultural exigencies such as bereavement leave, support to wellbeing and imperatives to improve education

- accommodating Inuit diet preferences, through meal offerings[25] and provision of storage and facilities for self-cooking of country foods

[24] There are many options in this regard, including scheduled leaves of absence, alternative rotation schedules, temporary worker pools and job sharing. Different options may suit different individuals. There will be a need for flexibility, ongoing consultation between AREVA and its workers and recognition that unpredictability in attendance undermines successful implementation of the Project.

[25] Currently, there is not a well developed market in Nunavut for the purchase of country food and Agnico Eagle reports some challenges in sourcing. There are also important sustainable harvest and health and safety

- providing sufficient communication services (telephone, internet and community radio) to meet the needs of employees to stay in contact as required with their families and communities

- including in health and safety training programs modules on sexual health, including inappropriate sexual behaviors and sexually transmitted infections, particularly HIV, as well as other pertinent health issues (smoking and nutrition for example)

- including in the evaluation criteria for contractors the extent to which they commit to similarly manage their workforces, as relevant, in meeting their contractual obligations and using this criterion in decisions on contract awards

- monitoring of contractor performance for compliance with their commitments and using monitoring results in decisions on contract administration and management

6.3.5 Effects on Wellbeing

Negative effects on wellbeing can arise from many sources. They can be the result of the challenges of rotational work, individual choice on how additional income is spent, inequalities introduced between different segments of society, in migration, and/or changes in traditional values consequent on increased participation in the wage based component of the economy and on cross cultural contact.

None of these is directly within the control of AREVA to mitigate completely. It is however in AREVA's interests to provide support to individuals, families and communities in managing the potential for negative effects. It is also important to recall that the increased economic activity the Project represents is generally considered to be of overall benefit to wellbeing, particularly in a context of high unemployment and poverty that have in themselves significant negative effects on individual, family and community wellbeing.

Of particularly relevance to mitigating the potential for negative effects on wellbeing are:

- as part of the terms of employment, a confidential EFAP that is competent to address in a culturally sensitive and knowledgeable fashion the full range of work/life issues that can arise for an individual employee, including problems with drug and alcohol abuse, addictions including gambling, inappropriate sexual behaviours, personal financial management, adjustment to change and stress, and family relationships

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considerations. How exactly AREVA may be able to supply country food to workers at the mine site in 2017 is not fully understood at this point in time.

- in the longer term, school based education and training initiatives for youth to enhance educational achievement and life skills in the context of participation in both the wage and land based components of the economy

- availability of elders, peer counselors and staff in community Project offices with some competence to ease work/life balance challenges

- human resources policies and procedures that give value to traditional knowledge, including the principles of sharing and cooperation, and enable traditional activities and practices

- support for community wellbeing initiatives as may be agreed in the IIBA or individually with communities, to address community priorities towards enhanced wellbeing – substance abuse management, recreational programs for youth, and IQ retention are examples.

6.3.6 Public Health and Safety

Worker and public health and safety risks will be managed first through the application of best health and safety practice. In addition, emergency response planning will ensure that in the event of a Project emergency, potential damages can be contained. Risks related to the Project access road (with controlled public use) and to road and marine traffic represent the most tangible risks to the Project workforce, and to the people of Baker Lake and Chesterfield Inlet. Environmental effects, for example on caribou and water, can have implications for public health and safety. There is also a requirement to address heightened perception of risk attributable to people's limited knowledge and experience with uranium mining. Measures put in place to minimize risks to health and safety are detailed throughout this DEIS, and include:

- comprehensive worker health and safety plans, training and enforcement (including human rights training for security staff) as detailed in Technical Appendix 2O, Occupational Health and Safety Plan

- comprehensive risk management and emergency response planning and training, including the provision of necessary emergency response facilities and/or equipment, and training in Baker Lake and Chesterfield Inlet as detailed in Technical Appendix 10C, Risk Management and Emergency Response Plan

- regular inspection and maintenance in good condition of i) vehicles; and ii) transportation infrastructure, including the access road, road crossings facilitating people's activity on the land, water crossings, signage, refuge stations, air strip and docking facilities as detailed in Technical Appendix 2L, Roads Management Plan

- taking into account health and safety issues in conditions placed on public use of the Project access road, for example the setting of limits on speeds and on the use of firearms along the road and an appropriate buffer

- driver training and enforcement of a driver code of conduct, to control speeds and encourage considerate driving

- ongoing communication in Baker Lake and Chesterfield Inlet of road and marine traffic schedules respectively, as well as consultations in Baker Lake, with regard to scheduling of heavy road vehicle traffic to minimize risks and any potential disturbance effects

- securing all Project facilities with potential to pose public health and safety risks, including prevention of public access where necessary

- avoiding and minimizing any environmental effects that have potential to affect public health, including those that may negatively affect livelihood resources

- providing emergency assistance where the health or safety of people travelling on the land near Project facilities (mine site and access road) may be at risk

- continuing the mine visit program,[26] to provide opportunities for people to better understand uranium mining and measures put in place to protect environmental resources and worker and public health and safety

- delivering public information and education programs on Project environmental effects and risks, to contribute to people's i) understanding of uranium mining; and ii) emergency preparedness

- delivering public information and education programs, targeted to the appropriate audiences, to enable enhanced community participation in both environmental and socio-economic monitoring

6.3.7 Community Contributions

In addition to contributions that may be negotiated as part of the IIBA, AREVA expects to continue to provide financial and in kind contributions, as has been done over the Project's

[26] Currently visits are to uranium mines in Saskatchewan. As AREVA moves into operations, visits to The Project will be initiated.

development phase, to Kivalliq communities. The contributions are made in response to community priorities, usually on the basis of requests by representative organizations. In the recent past, contributions have included the organizing of home visits for elders wishing to see the places they associate with past experience of living on the land and sponsorships for community events such as feasts, science fairs and sports events.

A review of requests to date indicates that community priorities for contributions include meeting the needs of elders, recreation facilities and events, keeping youth involved in traditional activities, and addressing pressing needs for child care. AREVA would expect to continue to respond to requests for contributions through the Project life cycle, including in partnerships with hamlet and regional organizations and institutions, and in collaboration with other mining companies.

6.3.8 Compensation

In the course of Project development to date, including exploration at the mine site, there has not been evidence that any Project specific disturbances to wildlife have resulted in declines in traditional harvesting. Therefore there has been no requirement for compensation for loss of economic resources. Nor, given the results of the IQ studies and the environmental effect assessments in this DEIS, are future such disturbances foreseen.

However, as is the case with any large project, there is some potential that a Project risk might be realized, with unforeseen consequences on traditional harvesting. The IIBA is expected to include provisions for compensation for mortality of some large mammals, with compensation being paid to the KIA. It is still possible however that an environmental risk could be realized with consequent effects on one or more individuals. In any such unlikely event, AREVA would ensure fair compensation to the affected individual(s), on the basis of an estimate of harm, including taking into consideration cultural loss. The compensation would of course depend on the determination of harm, but could imply a financial payment and/or an offset of some kind.

Nor is it expected that the Project will have any significant effects on commercial activity related to environmental resources. The Project mine site and access road proposed routes are not used for commercial harvesting or tourism, and are remote from areas, such as heritage rivers and parks, that are used. In the improbable event that effects on existing or expected commercial activity did occur, compensation would be negotiated with the affected individuals on the basis of demonstrable loss.

People are also concerned about compensation for any effects of the Project on human health. Standards for monitoring and protecting both worker and public health are very high for uranium mines and in the event of an unforeseen accident compensation is paid.

6.3.9 Closure

The socio-economic effects of final closure are most keenly felt in the coming to an end of employment and contracting opportunities created over, in this case, a period expected to be at least 18 years, and the consequent negative social effects of an economic downturn. The challenge is to ensure that in the process of enhancing access to economic opportunities during the Project's life, consideration is always given to eventual final closure. AREVA's intent is to have, by Project final closure, increased the capacity of Kivalliq labour and business to engage in economic activity that is independent of the Project.

The measures described above for employment, contracting and education and training include a number of elements that are intended to realize this intent. In addition, the overall objective of many of the effect mitigation and benefit enhancement measures described above is to contribute to sustainable development over the longer term. Although the final closure of the Project will inevitably cause dislocation, to the extent that the following are successful this dislocation should be attenuated:

- Employment: Preferential employment, training and culturally sensitive employment practices contribute to job performance, satisfaction, retention and advancement for people in Kivalliq. These, and the inclusion of preferential employment as a criterion for evaluation of bids from contractors, will build capacity to participate in the wage based component of the economy. These measures will provide the work experience that will give people a competitive edge in competing for jobs elsewhere in the economy.

- Education and training: Programs that emphasize not only preparation of adults for work for the Project, but that encourage the young to value education with a view to either AREVA employment or other participation in the wage based component of the economy has implications for long term employability. But in addition, the expectation is that such programs can provide motivation to higher education in areas such as health, education, public security and business administration. The potential for gradual replacement of non Inuit (frequently rotated out) education, health and other service delivery personnel with qualified Inuit not only increases Inuit employment opportunities but strengthens community resilience to the dislocations that can occur with closure.

- Contracting: Preferential contracting, assistance with the development of business expertise and including the use of Kivalliq businesses as a criterion for evaluation of bids from the Project`s supplying businesses, will build experience and capacity.

- Information sharing: Sharing AREVA's employment database and business inventory with both contractors and other mining companies in Kivalliq provides a wider market for employees and supplying businesses, both during and after the Project.

- Support to traditional culture: The inclusion in employment and education and training programs of consideration and support for individual decisions to combine formal wage

employment with traditional activity and practices contributes to resilience in face of economic dislocation.

- IIBA and community contributions: The IIBA will be negotiated according to priority needs in Kivalliq, while incorporating sustainability principles. Implementation of the IIBA will contribute to economic growth but also to the social and cultural wellbeing that underlies the ability of people to create and take up life opportunities. AREVA's ongoing community contributions, although modest, will have a similar effect.

In addition, AREVA will undertake a socio-economic impact assessment as final closure approaches, to detail specific measures that may mitigate at least to some extent the potential for negative effects. Such measures would be expected to include, as necessary:

- providing employee retrenchment programs, including out placement services and counseling

- for workers to be retrenched, during the last years of operations providing voluntary after hours alternative livelihood training programs

- managing any environmental effects of closure to protect the environmental resources that people use for livelihoods, including reclamation of land as practical to accommodate expected land use after final closure

- securing the Project site in the interests of public health and safety, and advertising these security arrangements widely, to protect people from health effects that might be caused by access to closed facilities and/or land and water that may still be exhibiting environmental effects

- potentially turning over Project physical infrastructure, such as buildings, accommodation camp, air strip, docking facilities and/or, if built, the all-weather access road, where interest warrants and agreement can be reached on terms of handover – it is noted that for purposes of this DEIS, AREVA's undertaking is to remove all physical infrastructure.

There is also a possibility for premature closure (temporary or permanent), which would occur if for any reason the Project became uneconomic and was expected to remain so over an extended period. Premature closure by its nature is unplanned and therefore has more potential for negative effects. Should premature closure happen early in the Project's life cycle, many of the expected benefits to the capacity of labour, businesses and communities to adjust may not have fully developed, and closure mitigation measures will not have been well detailed. AREVA would intend to work with communities and government to agree on appropriate measures, including schedules, to ensure that effects of any premature closure are managed as well as possible.

It is noted that the socio-economic effects of closure will to a large extent depend on whether or not there are economic alternatives available at the time of closure, to replace the Project. This in turn is expected to largely depend on progress in developing the mining sector in Kivalliq, and Nunavut more generally.

6.4 ROLE OF ENGAGEMENT AND IQ

Engagement and IQ are integral to socio-economic management implementation, monitoring and adjustment. AREVA's engagement plan has been conceived to provide people with the mechanisms they need to provide input, including IQ, such that the Project is better able to inform its decision making where decisions have potential to affect people. There are also expectations on the part of affected communities for participation in processes to monitor Project effects and to monitor AREVA's compliance with conditions under which the Project may be approved.

Information disclosure provides the information people need to engage and participate in the Project from an informed position. There is clear interest on the part of affected people for more information on the Project, its potential effects, and proposed socio-economic management measures.

The full details of AREVA's engagement are provided in Technical Appendix 3C, Community Involvement Plan. The parts of the plan related to engagement are summarized below. It is noted that AREVA fully acknowledges the importance to conduct meetings and provide information not only in English but also in Inuktitut, such that the input and IQ of Inuktitut speakers can be captured and used to better manage socio-economic (and environmental) effects. AREVA's engagement undertakings include:

- continuing to resource and staff the Project office in Baker Lake, to provide a place where people can easily go to ask questions, express concerns, get information on the Project, lodge grievances and/or attend meetings with Project staff

- funding and managing staff members in all other Kivalliq communities with responsibilities to offer similar services to people

- holding formal public meetings (open houses) at the community level at regular intervals, and at additional times as may be requested or required – such meetings will focus on updates of information on the Project's progress; discussion of the current understanding of Project effects, risks, and (environmental and) socio-economic management measures in response; and upcoming opportunities for participation in the Project

- holding meetings with:

    - the Community Liaison Committee in Baker Lake and the Regional Liaison Committee, to discuss and resolve issues of concern as these arise

    - communities and governments to develop and implement activities in support of socio-economic management measures, including for example education and training initiatives and community contributions

    - sub groups, for example with businessmen, elders and women, to discuss and resolve issues or advance opportunities that may not be of general interest

- maintaining and monitoring the content of Project websites that provide and avenue for input by any stakeholder, including the Project Blog and Facebook and Twitter accounts

- cooperating as warranted with territorial, regional and hamlet authorities in meeting economic and social development goals

- distributing periodic information with appropriate content and through appropriate media on Project progress and events of interest, including current information on Project activities, effects and risks, (environmental and) socio-economic management plans, economic opportunities and community contributions

- clearly notifying in all Project information media of names and coordinates of staff with responsibility for community relations

- fostering a workplace environment that facilitates worker input without fear of misunderstanding or retribution

- including engagement, participation and public reporting of results in (environmental and) socio-economic monitoring programs

- implementing a guided mine visit program, including site visits for family members of Project workers

- providing training to management and supervisory staff, including those of contractors, on communication with Inuit employees and people in communities, as well as on engagement and on the grievance mechanism (see below)

- maintaining an engagement database with the results of all the above events, including any issues raised and undertakings to resolve these issues

- internally reporting monthly and by exception as necessary on the results of the engagement activities such that these results can be used as input into Project decision making

- implementing a grievance and dispute resolution mechanism, to manage any instances over the life of the Project where people feel they have, and may indeed have, grounds for complaint – this mechanism will include:

  - a simple and accessible process to lodge a grievance, either verbally or in writing

  - clarity on roles relative to addressing the grievance for each of the person lodging the grievance, hamlet governments, the KIA and AREVA

  - the time frame within which a response to the grievance is provided

  - an appeal process, through mediation or arbitration, that defines time frames and roles for instances where a grievance escalates into a dispute because the response is not deemed satisfactory – by the person/group lodging the grievance, government representatives, or AREVA

  - a system to record all grievances, disputes and their resolution

  - a formula on how the costs of grievance resolution are to be shared

  - means to ensure feedback for action to relevant AREVA and/or contractor staff where systematic grievances are being observed.

6.5 MONITORING

AREVA's community relations and other management staff would normally informally monitor the day to day implementation of socio-economic mitigation and enhancement measures in the course of management and administration of their relationships with Project workers, and with people in communities and their representatives. Meetings in communities with representatives of elders, youth, women, business, hamlet governments and others, are vehicles for discussion of Project related issues. Project staff resources in each of the seven communities also provide means for people to raise issues on a daily basis. Facilitating access of workers and people across Kivalliq to AREVA allows the identification of concerns as these evolve. There is also however a requirement for formal monitoring, and for reporting on monitoring results.

6.5.1 Objectives and Principles

Objectives

The imperative of the Project to deliver concrete economic benefits suggests that a priority for monitoring activity be the measurement of those benefits. In addition however, monitoring is necessary to establish trends in community wellbeing, such that problems, that may be related to the Project or that the Project can effectively address, can be identified.

The overall objectives of socio-economic monitoring are thus to:

- record the uptake of employment, education and training and contracting opportunities over time and analyze the trends in this uptake in relation to expected outcomes

- determine the effectiveness of socio-economic effect mitigation and benefit enhancement measures, including for example employee and family assistance programs and measures to accommodate traditional culture in the work place

- participate with people in communities and governments to evaluate the trends in economic and social development and wellbeing in Kivalliq, as well as the relationship between these and Project

- demonstrate compliance with Project socio-economic management commitments.

It is noted that monitoring does not solely consist of the identification of indicators and the collection of data on these indicators. It is more importantly the analysis of data collected in relation to the objectives of socio-economic management, the realities of Project implementation and the socio-economic dynamic in affected communities. Further, monitoring is only valuable insofar as it is comprehensively reported and the results used to adjust socio-economic management measures.

Principles

AREVA's principles for its monitoring are:

- Relevance: AREVA's monitoring responsibilities are limited to the monitoring necessary to establish the degree to which the Project i) is achieving its objectives in terms of benefits to Kivalliq communities; ii) may be having negative effects on individual and/or community wellbeing; and iii) is meeting its DEIS commitments.

- Cost-effectiveness and efficiency: There are many data that are already collected within communities by various levels of government. It is important to identify indicators that are pertinent to monitoring objectives, and that affected people themselves identify indicators. However, to the extent possible selection of such indicators should be made from data already being collected. This is in the interests of cost effectiveness and efficiency, but also of data comparability across both space and time, which facilitates data interpretation and analysis.

- Confidentiality and transparency: Much socio-economic data, individual but also community level data in small communities, needs to be treated as confidential, as of course does any analysis of that data. However, confidentiality cannot be extended to those who need the data and analysis to make decisions, adjust mitigation and benefit enhancement measures, or commit resources. There is a requirement for transparency among parties to a monitoring program such that the monitoring results can be used effectively and within the limits of confidentiality there is a requirement for transparency with regard to making monitoring results available to communities.

- Participation of affected people: AREVA recognizes that effective monitoring, with few exceptions more related to compliance than to socio-economic Project effects, is only possible with the participation of affected people.

- Synergies with other monitoring initiatives: AREVA sees potential significant overlap between obligations for reporting under the DEIS, the IIBA, and expected output of its participation in the Kivalliq`s Socio-Economic Monitoring Committee (SEMC) and eventually the Nunavut General Monitoring Plan (NGMP). For many reasons, including efficiency and clarity and comparability of results, AREVA would wish to ensure no duplication of effort. This in turn implies cooperation between the various parties to these monitoring initiatives (see Section 6.5.2 below).

6.5.2 Socio-economic Monitoring Context

The last bullet above refers to other monitoring initiatives. Nunavut is a society in transition and has important economic and social challenges that need to be managed in a context of rapid change. A major force of change is expansion of the mining sector. The relationships between construction and operations of large mines and community economic and social development and cultural change remain not fully understood in Nunavut or elsewhere in northern Canada (see Section 7, Comparable Experiences).

Multiple governing agencies, with various responsibilities for economic and social development and for culture in Nunavut, have responsibilities to participate in the monitoring of community wellbeing generally, including with reference to the effects of mining and to the effects of the Project specifically:

- Currently a primary mechanism for meeting these responsibilities is joint participation of government and industry on each of three regional SEMCs, including the Kivalliq SEMC. SEMCs are led by GN, as the level of government with primary responsibility for socio-economic monitoring. The Kivalliq SEMC also has representatives from hamlets (mayors), KIA, GN departments and other agencies, NIRB, Aboriginal Affairs and Northern Development Canada (AANDC) and industry – currently Agnico Eagle and AREVA regularly attend. The SEMC monitors and reports on industry's performance regarding employment, contracting and other contributions to Kivalliq communities, as well as on regional socio-economic conditions as these evolve.

The work of the Kivalliq SEMC is somewhat challenged, including by limited data availability. Industry representatives are able to report current data on economic opportunities offered by their projects however regional and community level data of most interest to understanding socio-economic change, and changes that might be specific to mining effects, are generally available with a minimum of a two year lag, or are unavailable.

- Under the NLCA, there is a requirement for government, in cooperation with the Nunavut Planning Commission (NPC), to develop and implement a general plan for the monitoring of the 'long term state and health of the ecosystemic and socio-economic environment' in Nunavut (NLCA, Article 12.7.6). Accordingly, NPC, NTI, AANDC and GN are working on the development of NGMP. They are currently consulting on the plan, on VECs and VSECs to be monitored, and on the indicators to be used for monitoring, and are developing data information management systems for NGMP implementation. The NGMP is expected to support decision making through the provision of credible data. An eventual interface with SEMC monitoring is expected and the NGMP could go some way towards providing the data SEMCs need to better monitor regional socio-economic trends.

- With the negotiation and signature of an IIBA with the KIA, it is expected that AREVA will be required to provide monitoring reports to the KIA. It is also expected that the terms of the IIBA will include significant overlap with EIS socio-economic management commitments. As noted above, KIA participates in the Kivalliq SEMC.

- NIRB has monitoring responsibilities related to the implementation of approval conditions for the Project, including socio-economic management commitments.

In the event that AREVA concludes a Development Partnership Agreement with GN, there will also be reporting requirements specific to the terms of that agreement. Thus there are four, and may be five, different monitoring mechanisms that AREVA either directly, or by association, will participate in.

In this context, broadly speaking, AREVA's social monitoring plan is conceived as having two components: i) operations monitoring, to report on AREVA's internal information management system data on socio-economic management inputs and outputs; and ii) collaborative monitoring, that is participation in governments' initiatives towards monitoring of socio-economic conditions, trends and outcomes in Kivalliq communities. Operations monitoring data are of primary interest to the Kivalliq SEMC, KIA and NIRB. Collaborative monitoring data are of interest to all parties to socio-economic monitoring in Nunavut. These two types of monitoring are described in Sections 6.5.5 and 6.5.6 respectively.

6.5.3 Monitoring Issues

While it is expected that the Project will result in substantial benefits to people over its life cycle, some negative effects can be expected as well. Most of these negative effects are unpredictable in their scope – how significant they will prove to be and how many people and who exactly may be affected. In some cases there are no clear means to mitigate some of these potential negative effects, without understanding what they actually turn out to be in detail. Uncertainty about effect outcomes means monitoring is critical to adaptive management.

However, at least in a preliminary fashion, issues that may need monitoring can be identified on the basis of concerns people and governments have about the relationship between the Project and community economic and social development and culture. Taking into consideration engagement results; community priorities for monitoring as made evident in the deliberations, for example, of the Kivalliq SEMC and work toward the NGMP; experience to date of Meadowbank`s effects; and the conclusions presented in Sections 8 to 12 below on residual Project effects on Kivalliq communities, the following issues have been preliminarily identified as of potential interest to AREVA's socio-economic monitoring for the Project. It is noted that this list is not necessarily totally coincident with priorities for the Kivalliq SEMC and NGMP, whose responsibilities for monitoring are broader than those of AREVA can be expected to be.

- uptake of Project employment, contracting and training opportunities
- personal job satisfaction and lifestyle adjustments of AREVA employees
- effectiveness of education and training initiatives, both work force training and the broader education and training initiatives
- labour markets in communities
- in and out migration levels, and consequent effects
- use of Inuktitut and traditional practices, values and knowledge
- physical and mental health
- poor personal choices with regard to use of increased income, and consequent outcomes on components of community wellbeing
- pressures on physical and social infrastructure, specifically housing and policing.

6.5.4 Community Level Data Availability and Analysis

AREVA`s information management system will provide data on Project inputs and outputs related to socio-economic management. Such information includes data that may be of some use to understanding some community level effects. For example, AREVA will have data on worker residence and can therefore track migration at least of Project workers between communities. Rates of use of on-site elder and peer counselors and of EFAP can provide a measure of job satisfaction and lifestyle adjustment challenges. Additional data are however needed, most appropriately collected through collaborative monitoring.

The baseline study has collected some data against which to measure community trends in such areas as population, educational achievement, average household size, participation and employment rates and average income. These data are periodically publicly reported by government, on the basis of household surveys or other sources of information, and are thus are fairly straightforward to collect over time. Canadian census data are useful because of completeness however the data are only collected every five years and there is up to a two year lag in release after collection. Statistics Canada also provides data to the GNBS that is culled from tax files. These data are less complete and not always presented at a community level, but are available on an annual basis, with a one to two year lag.

In addition, education, health, social assistance and police services keep detailed data on their operations. Most of these data are not public on confidentiality grounds, but could be used to derive rates of teenage pregnancy, attempted and actual suicides, domestic violence, mental health breakdown and various types of crime as examples. Such data are often more pertinent to monitoring wellbeing indicators than the census or tax file data are. These data, in an appropriately aggregated form to respect confidentiality concerns (in some cases only at a regional level), could in principle be provided by the agencies collecting them.

Monitoring perceptions, through ongoing engagement with affected people, is also important. The extent of sharing and cooperation, the degree to which the Project workplace accommodates traditional culture, the levels of disturbance as a result of increased traffic and the legal but disruptive behaviour of out of area workforces for example of effects that are subjectively experienced. AREVA's ongoing engagement with its workers and people in communities can provide some such information, and it may be that additional purpose or issue specific engagement (through focus groups for example) could be organized.

As is evident in the NWT (see Section 7, Comparable Experiences) understanding the effects of mining, or a particular mining project, as opposed to changes in socio-economic indicators caused by other events or combinations of events, is challenging. It may be considered that collecting data from mining workers, as opposed to from a community`s population in general, could contribute to a better understanding of the effects of mining specifically. There may be an option, to be developed in consultation between the Project, its workers, various agencies responsible for monitoring, and perhaps additionally Agnico Eagle, to collect data that would

enable the disaggregation of socio-economic indicators for workers from those for an entire community population.

It is acknowledge that some types of investigations that may be necessary to unravel Project effects from overall economic, social and cultural change can be particularly invasive. To understand the drivers of an unforeseen rise, for example, in teenage pregnancy requires more than evidence of coincidence of the observed rise and the mobilization of a Project. Monitoring data would need to extend to an understanding of under what circumstances the pregnancies occur to adjust socio-economic management measures in response.

Finally, although not always a data source on Kivalliq communities, monitoring and analysis of the effects of resource development projects on communities across the north is ongoing, by governments, academics and resource extraction companies. Insights from such studies can inform the interpretation of data collected as described above.

As data from the above data collection events become available, there will be a requirement to interpret any resulting evidence of socio-economic trends in Kivalliq communities and their relation to the Project. Such interpretation is needed if the monitoring results are to be effectively used in adjusting socio-economic management on AREVA`s part. It is also noted that the analysis would also be useful to governments in planning and decision making.

6.5.5 Operations Monitoring

This is the collection, analysis and reporting of internal AREVA information related to, for example, uptake of Project employment, contracting and training opportunities, health and safety performance, engagement activity, grievances, and contributions to communities. AREVA's own records on its operations thus can provide much monitoring data on undertakings described in this DEIS. In this regard, AREVA undertakes to:

- maintain full human resource records in a from that permits an annual roll-up of selection, employment, promotion, training and exit statistics on the workforce by ethnicity, residence, gender and level as a percentage of the total workforce

- maintain procurement records in a form that permits an annual roll-up of the number, value and general content of contracts for goods and services by supplier location and Inuit content, as a percentage of total procurement

- require of all contractors annual reporting on employment and procurement that provides the same information

- maintain health and safety, accident and incident, breach of worker codes of conduct and any other relevant records pertaining to events that occur in direct relation to Project activity

- flag any anomalous results of traffic, air quality, noise, water flow and quality and biological monitoring programs, in order to permit an assessment of potential for social effects

- maintain records on all public education and training events (for example, public emergency response training), including the content of and participation rates in events

- maintain records on other social effect mitigation and benefit enhancement measures and on AREVA's contributions to communities, identifying as relevant objectives, organizations in receipt of support, implementation details and number of beneficiaries

- maintain records on all engagement events with the public, government, partner organizations, the Project workforce and contractors, noting attendance, issues raised and resolutions

- maintain records on Project commitments to stakeholders and on grievances and their resolution

- maintain records of all information disclosure materials distributed by the Project

- at least on an annual basis undertake a formal review of the results of the above to determine the degree of compliance with EIS related undertakings, and to identify (and address) any specific obstacles or problem areas and any systematic successes or failures.

The above monitoring will be managed and administered solely by AREVA, insofar as it consists of the reporting of internal management information, maintained in a database that can be easily accessed for reporting purposes. AREVA will communicate the results internally to management, its workforce and its contractors as appropriate, such that the information can be used to adjust policies, procedures, and socio-economic management measures where adjustments are identified to be necessary. The results will also be annually reported in appropriate forms and discussed with communities, the Kivalliq SEMC, KIA, and NIRB, with a view to maintaining an environment of transparency and accountability, and to building confidence in AREVA's economic and social performance relative to commitments.

6.5.6 Collaborative Monitoring

Collaborative monitoring for adaptive management is intended to capture trends in local economic and social development and culture, as well as the relationship between these and the Project, such that any evolving negative social effects can be managed and any positive benefits can be learned from and enhanced. Further, irrespective of directly attributable cause and effect, it is in the interests of AREVA to understand socio-economic trends such that where the Project is able to intervene effectively, it has the information to do so. AREVA has a long

term interest in healthy communities. Finally, putting in place a monitoring framework that attempts to understand cause and effect is important to both AREVA and Kivalliq, towards maintaining a constructive relationship between communities and the Project.

AREVA would intend to collaborate with communities, KIA, GN and AANDC to develop a framework for collaborative monitoring, primarily through participation with the Kivalliq SEMC. The details of this framework will be negotiated as part of the EIS process (and the IIBA), and will likely evolve over time as the relative capacities, interests, activities and responsibilities of the Kivalliq SEMC and the NGMP are further developed over the interim to 2017. The rest of this section thus provides AREVA`s early thinking on its role in this collaborative monitoring and on indicators that might be considered as relevant to a better understanding of Project effects on economic and social development and culture in Kivalliq.

AREVA's Role in Collaborative Monitoring

AREVA sees it role, through participation with the Kivalliq SEMC, as:

- contributing to government monitoring processes any relevant information collected by AREVA on its day to day operations, as described in Section 6.5.5, Operations Monitoring – this reporting will include some analysis of results relative to socio-economic management desired outcomes, for example on reasons for worker terminations and barriers to worker advancement

- developing, in collaboration with the Kivalliq SEMC and other parties, a detailed monitoring plan which defines issues, appropriate indicators, methodologies for data collection and analysis, roles and responsibilities, schedules and budgets – care needs to be taken to ensure that this monitoring plan fulfills the objectives of Kivalliq SEMC monitoring, but also is as consistent and complementary as possible with monitoring requirements of the IIBA, NIRB and NGMP

- providing financial[27] and technical support to the SEMC as may be agreed, including potentially through the funding of work of technical resources to assist in the development and the implementation of parts of the detailed monitoring plan and to develop capacity within the Kivalliq SEMC

[27] There are costs associated with the time of participants in collaborative monitoring group, data collection events, expert services, translation, and/or reporting on monitoring results to communities.

- discussing with participants in collaborative monitoring, as well as with Project workers to the extent they are implicated, options for the collection and reporting of additional data, for example on Project workers and their families, that may contribute to a better understanding of Project effects on communities

- collaborating with Agnico Eagle (or other mining related companies that may in future be implicated in socio-economic monitoring) towards some consistency in approaches for any data collection on mining sector workers, as agreed as useful in the detailed monitoring plan

- respecting confidentiality concerns of both workers and other participants in collaborative monitoring, which could extend to maintaining an arm`s length distance from data collection, analysis and reporting

As noted above, there are currently limits on the availability and usefulness of data for purposes of monitoring socio-economic effects of the Project specifically. Some of these data gaps may be addressed with time as the NGMP is rolled out. More public reporting, even aggregated at a regional level, of data currently held by government service delivery staff for example would assist the Kivalliq SEMC to monitor wellbeing.

In addition, there are three potential avenues for AREVA to assist in addressing gaps. The first would be to take advantage of data that AREVA would expect to have on its workers, but would not necessarily report if currently applied reporting requirements were followed. Agnico Eagle has initiated something along these lines to an extent – for example, their reporting to the Kivalliq SEMC in 2010 included a qualitative analysis of employee turnover. Such reporting could be expanded to include, again as examples, quantitative measures of worker job satisfaction (data on worker grievances), work related family stresses (data on use of counselors and EFAP) and migratory movements between communities (worker residence data).

The second avenue that might be considered would be to agree with workers that data could be collected from them as a subpopulation of interest. If quantification of trends were an objective, this would most effectively be done using questionnaires. Questionnaires are not often used in northern Canada and there is some conviction that people may be unwilling to participate in this kind of survey. Experience suggests however that where people understand the purposes of data collection and how the data will be used, are offered the opportunity to decline to answer any specific question and are confident of confidentiality, there is willingness to participate.

The third possible approach would be similar to that in place in northern Saskatchewan, as a collaborative exercise between communities, government and mining companies. This process has been running since 1999 to look at and address issues, according to priorities communities themselves identify (see Section 7, Comparable Experiences for a fuller description of this process). Rather than regular collection and reporting of data, the process involves ongoing consultation with communities to identify and address issues communities feel are of interest.

The process is thus highly responsive, and purposes specific in its activities, but does not include regular collection of indicator data.

In addition of course, some combination of any of the three avenues outlined above could be agreed.

Indicators

Socio-economic monitoring in Kivalliq is rapidly evolving, as are socio-economic conditions and learning about the effects of Meadowbank. Indicators are derived from issues and although a preliminary list of issues is presented in Section 6.5.3 above, these would need to be confirmed in order to arrive at appropriate indicators. With Project construction at least five years in the future, it is premature to predetermine indicators for collaborative monitoring. As noted above, AREVA would expect to work with the Kivalliq SEMC and other monitoring partners to develop a detailed monitoring plan before construction begins. This subsection thus simply provides some early thinking on indicators that may be of some interest and could in principle be collected on workers as a subpopulation, if it is agreed that more quantitative information on workers is a worthwhile objective for collaborative monitoring.

In principle, the selection of indicators should parallel what is being done elsewhere for purposes of comparability and shared lessons learned. Table 6.5-1 presents indicators presently used in the Northwest Territories (to monitor the effects of diamond mining) and in Nunavut (to monitor community wellbeing). These indicators are listed in columns numbered 1 to 4. (The table also includes a double column, column 5, which is explained below).

Table 6.5-1 Monitoring Indicators

	1. NWT (2010)	2. Kitikmeot (2006)	3. Doris North Plan (2007)	4. Kivalliq SEMC (2009)	5. Possible Project Worker Indicators	
					Worker	Family/Members
Population		population	population	population	no. of workers	family size
		population growth		population growth	community of residence	in/out migrating family members
		age and gender distribution		age and gender distribution	age, gender and ethnicity distribution of workers	same
		under 16 population				
		ethnicity				
Education	high school completion		no. of high school graduates	high school completion (age 20 to 25)	educational achievement	grade or if out of school, educational achievement
	less than grade 9			education, age 25 to 64		
			no. seeking mine-related training through the Nunavut Community Skills Inventory System	registered apprenticeships by type		no. registered in post-secondary training, by length and type of program
					no. registered in mine related training programs on/off site, by length and type of program	same (off site)
		school capacity				
		school attendance		truancy rates		

Health and wellness	injuries					
	potential years of life lost					incidence of injury/accident
	suicides	suicides				no. of suicides and attempted suicides
	communicable diseases (sexually transmitted)	sexually transmitted infections				no. and type of sexually transmitted infections
					health and safety data, leaves granted on wellbeing grounds, use of counsellors and EFAP, use of health facilities	no. and type of chronic disease conditions
						no. and type of infectious diseases
						drug/alcohol/cigarette consumption
	teen births	teen births				teen births
	single parent families	family structure				single parent families
	children receiving services	children in care	children in care			children in care
			interventions involving children			no. of social service interventions involving children
	spousal assault					(included below)
			visits to health centres by community		use of mine site health facilities	visits to health centres/hospitals

		health professionals				
Housing	crowding	household size				no. of people per dwelling/bedroom
	core need		applicants for social housing			housing quality
	home ownership		new private housing units	housing by type of tenure		housing by type of tenure
						internet access
						energy use
Crime	total police reported crimes	criminal incidents by category	overall crime rate by community	reported criminal code incidents	leaves/terminations for reasons related to crime (victim or perpetrator)	victim of violent crime, domestic and other
	violent crimes					victim of property crime
	property crimes		calls by community			calls related to substance abuse
	traffic crime		calls related to youth			calls related to domestic violence
	federal statute crimes		calls related to domestic violence			calls related to substance abuse with domestic violence
			calls related to drugs			(included above)
			calls related to alcohol			
		charges by age and gender				

	trapping	trapping				registered trappers
	hunting and fishing	hunting and fishing				registered hunters
		made crafts				artists
Traditional economy	aboriginal language use (youth)					language spoken most often in the home
						voting rates
						volunteering
Nontraditional economy	average income			median household income	salaries/wages	household income
			cost of living or food price index	purchasing power		
	wage disparity					
						earnings and government transfers, % of total income
	employment rate	working age population			job category	(included above)
		employment rate by industry and job category				employment by industry and job category
		employment rate by gender and ethnicity				(included above)
		worker education				

		employment by industry				
	unemployment rate					unemployed (rate calculated from above data)
	participation rate	labour force				participation (rate calculated from above data)
	business activity		new businesses	GST filers		no. of GST filers
					worker satisfaction measures (resignations, grievances)	job satisfaction measure (resignations)

Sources: 1. GNWT, 2010; 2. Kit-SEMC, 2009; 3. Miramar Hope Bay Ltd, 2007; 4. Kivalliq SEMC, 2010

Note: Miramar's monitoring plan also included a number of additional indicators related to Project inputs and outputs, rather than to community wellness outcomes.

Not only the Kivalliq SEMC, but also other regional SEMCs, have been discussing appropriate indicators for some time.[28] Currently, the Kivalliq SEMC list of indicators is quite short. However, it is noted that other issues have been raised during meetings, with thought being given to obtaining additional data. For example, as of 2010, the Kivalliq SEMC was also interested in exploring any relationships between employment and drug and alcohol abuse and between employment and activity on the land. Thus their indicator list can be considered under development.

It will be seen from the columns numbered 1 to 4 that different indicators are of interest in different jurisdictions, although there is some convergence on major themes. However there is no socio-economic monitoring standard in common use, perhaps not least because in different communities, different issues are of most importance. The availability, collectability, usefulness and relevance of indicator data tend to be specific to the realities and perceptions of a given population.

For example, if the incidence of family breakdown is agreed to be an important component of community wellbeing (as it is in NWT but is not, at least not yet, in Kivalliq), what indicator is (or what indicators are) appropriate to measure changes in incidence? In a community with adequate shelter options, the number of women and/or children in shelters may be a good indicator, but if shelters have closed, or are often operating at capacity, it is not. In some communities, the number of women in shelters may be considered too confidential to report, whereas the percentage of female headed households may not be. Because there are good data regularly (if infrequently) collected and reported on female headed households, this may be a preferred indicator for reasons of comparability with trends in other jurisdictions.

There is a challenge additional to selecting appropriate indicators and collecting data. That is to interpret the data. Data provide only a measure of change, not an explanation for that change. Some of this challenge can be addressed by the selection of indicators, but some can be addressed by the collection of data on subpopulations. For example, if an increase in family breakdown, however measured, is observed in the period after a mining project begins, why specifically has this occurred and in what proportion relative to what cause? Is this a continuing trend for reasons that have little to do with a mining project? Do increasing employment opportunities for women in the broader economy give some the financial independence to leave poor marriages? Is stress related to rotational employment a contributing factor to marriage breakdown? Without explanation, neither a project nor communities are able to frame a response to what may appear to be, but in fact may not be, a negative project related effect.

[28] As of the most recently available reports the Qikiqtaaluk SEMC was still discussing, but had not agreed on, indicators. NGMP is also in the process of establishing indicators.

In this context, there is a gap that AREVA, potentially in partnership with other mining companies, may be able to help fill. The columns numbered 5 in Table 6.5-1 provide a notional indication of the kinds of data that it is conceivable consideration could be given to collecting from mining workers and their households and family members, for comparison with data on people in general. To the extent that there are worries about the negative effects of mining employment on, as examples, drug and alcohol abuse, traditional culture and language use, the linkages are through the choices made by mining workers and their families. Thus separating out mining workers from the rest of the population could provide more explanatory power to analyses of trends in indicators. The indicators in the table were selected to approximate indicators used in other jurisdictions, for purposes of comparability. Again, it is emphasized that the table is not a proposal, but an illustration of the kinds of data that might be collected.

It is acknowledged that there are a number of challenges to collecting data on Project workers:

- Unwillingness on the part of some workers can have implications for the representativeness of results.

- Some data that in principle could be collected is highly personal in nature. People may not want to give answers, or not provide correct answers to very personal questions, such as STI incidence or suicide attempts. This may not only be for reasons of confidentiality outside the family, but also inside the family. Parents for example do not necessarily know everything about their children.

- Even if data could be reliably collected, there are important confidentiality concerns. Who the data are collected by, and how the data are reported and to whom, are issues that would need to be resolved. It can be more appropriate for third parties to collect data and manage confidentiality concerns than either mining companies or community groups. Where incidence rates are small, within the group of workers or within communities, data may not be reportable or reportable only at a regional level.

- Some of the data that the table indicates might be available on workers is not currently available at community or regional levels. This may change, in response to the NGMP or to specific requests by the Kivalliq SEMC to, for example social service delivery staff. There is less value in collecting data from workers if comparable data are not available for the larger population.

- AREVA would only be able to collect such data on its own workers. Project effects such as indirect and induced employment, migration, or changes to social cohesion (and consequences of these) are not specific to mining workers. Thus although data on workers can provide more explanatory power, other investigations may also be necessary.

- Notionally identical processes should be put in place by others additional to AREVA – larger sample sizes both contribute to data reliability and alleviate some confidentiality

concerns. This requires additional collaboration, coordination and potentially joint funding.

Thus there is much to discuss and agree to put in place a plan for collaborative monitoring of many of the potential Project socio-economic effects. It is also noted that as the Project advances, both Project effects and issues of concern to communities will evolve and monitoring plans will need to evolve in concert.

Path Forward

AREVA would expect to discuss the path forward for collaborative socio-economic monitoring as the EIS and IIBA processes advance, and as NGMP and the Kivalliq SEMC develop their approaches, indicators and capacities. This would be with a view to having at least an initial plan, likely fairly modest, in place before construction begins in 2017. In the interim, AREVA expects to continue to participate on the Kivalliq SEMC and to continue to provide the kinds of operational data it routinely collects.

6.6 INUIT IMPACT BENEFIT AGREEMENT

The NLCA sets out matters considered appropriate for Inuit benefits of projects (Schedule 26-1). Aside from contractual conditions (such as for arbitration, amendment and enforceability), and the provision that the IIBA appropriately includes any matter that the parties consider to be relevant to the needs of a project and the Inuit, the following matters as set out in the NLCA are consider appropriate to managing the socio-economic benefits of the Project:

- Inuit training at all levels
- Inuit preferential hiring
- employment rotation reflecting Inuit needs and preferences
- scholarships
- labour relations
- business opportunities for Inuit including
    - provision of expert advice
    - notification of business opportunities
    - preferential contracting practices

- housing, accommodation and recreation
- safety, health and hygiene
- language of workplace
- research and development
- Inuit access to facilities constructed for the Project such as airfields and roads
- information flow and interpretation, including liaison between Inuit and the proponent regarding project management and Inuit participation and concerns
- co-ordination with other developments
- obligations of subcontractors.

It will be noted that there is complete overlap of the generic matters listed above, and AREVA`s commitments in this DEIS. It is not expected that IIBA negotiations between AREVA and KIA will negate in any way AREVA`s current intentions for socio-economic management, however, it is expected that the IIBA will contain differences in detail. This implies that the full details of all effect mitigation and benefit enhancement measures will not be confirmed until the IIBA is negotiated.

The NLCA also requires that, unless otherwise agreed, that IIBA negotiations are to be initiated at least 180 days prior to the start-up date of a major development project (Article 26.4.1.). According to current Project schedules, this date would fall some time in 2016. AREVA is currently in discussion with the KIA on the path forward for IIBA negotiations. Both parties have agreed that, given the potential for change over the coming six years to 2017, while a framework for negotiation can be discussed at this time, it is premature to discuss IIBA terms. Thus for purposes of this DEIS, there is no information available on IIBA terms.

The IIBA is expected to address not only many of the details of what impact mitigation and benefit enhancement measures are to be implemented, but also details on how they will be implemented. It is noted that hamlet councils, KIA, NIRB, GN and AANDC all have legislated and regulatory responsibilities with regard to the implementation of the Project, with regard to the economic and social development and culture of people under their jurisdictions, with regard to socio-economic monitoring, and consequently with regard to the management of any effect mitigation and benefit enhancement. A seamless interface is therefore needed between the DEIS and the IIBA, an interface that awaits the negotiation of the IIBA.

6.7 OTHER INITIATIVES IN SUPPORT OF SOCIO-ECONOMIC DEVELOPMENT AND CULTURE IN NUNAVUT

AREVA expects that the Project will increase economic opportunities in Kivalliq but acknowledges that there are some challenges to managing many of the potential socio-economic effects of the Project. In very general terms, these include that the Inuit have limited educational achievement, businesses are small and inexperienced and the take up of economic opportunities should not be at the expense of traditional culture or individual and family wellbeing. Such challenges are not specific to the Project, but are of general concern to government as the economy of Nunavut continues its transition from a land based to a mixed economy.

Accordingly, there are already very many programs in place in Nunavut to address such challenges. This is the context within which AREVA expects to implement socio-economic management. There is a need to ensure that AREVA's socio-economic management measures are consistent with existing polices, plans and programs and there are opportunities for partnerships that can enhance the effectiveness of AREVA's socio-economic management. In addition, policies, plans and programs of both the public and private sectors will contribute to mitigating negative Project effects and enhancing benefits.

The list below is a very partial indication of the breadth of activities in Nunavut that are in place to strengthen community economies, and to support traditional culture and wellbeing. These and other policies, plans and programs, will contribute to the capacity of Nunavummiut to manage negative effects and access benefits of the Project.

- Nunavut Tunngavik Inc. has numerous programs for hunters and harvesters, providing financial assistance for equipment for traditional activities (including sewing), for HTOs to organize community harvests for the benefit of all community members, and for the teaching/learning of survival and other traditional skills

- The Government of Nunavut passed the Inuit Language Protection Act in 2009, to protect and revitalize Inuktitut, including the creation of a fund to support improving Inuktitut literacy and proficiency.

- The Department of Culture, Elders, Language and Youth is working to standardize Inuktitut terminology, supports efforts to protect, promote and preserve traditional culture and language, supports elder and youth initiatives, and has developed the Inuit Societal Values project to strengthen the role of elders in addressing social problems.

- The Department of Education has developed a bilingual education strategy for Nunavut, addressing areas such as curriculum and teaching and learning resources more specifically targeted to ensuring that students are proficient in English and Inuktitut. The

department certifies elders to be hired in schools to assist in teaching about Inuit culture, tradition and knowledge.

- Nunavut Arctic College has programs to build traditional arts and crafts skills, including the business skills needed to successfully market products. The college has succeeded in developing training programs wholly within Nunavut for teacher and nurse certification and has recently opened a trade school in Rankin Inlet.

- The Department of Health and Social Services implements a range of public health education and disease prevention programs, and works with Health Canada on drug treatment programs, specifically with at risk Inuit youth in areas of substance abuse and mental health.

- The Department of Economic Development and Transportation has developed a strategy for growth in the arts and crafts sector, funds programs to implement the strategy, and has a small business support program.

- Aboriginal Affairs and Northern Development Canada provides funding for postsecondary training, community infrastructure, and support to business development.

- Regional Inuit Associations work to provide youth with accessible, community□based, culturally relevant support for economic, social and personal development, in areas such as education, skills development, life skills, parenting and recreation.

- The Kivalliq Mine Training Society is working with Agnico Eagle to train youth specifically for employment opportunities as Meadowbank.

- The Nunavut Business Credit Corporation provides financing to businesses based in Nunavut.

- The Nunavut Research Institute promotes IQ, science and research as a resource for the wellbeing of Nunavummiut

7 COMPARABLE EXPERIENCES

As noted in Section 4, Scope and Broad Methodology of the Assessment, where experiences of other northern communities in proximity to large mining projects are documented, these have value in the assessment of potential Project effects on Kivalliq communities. Although there are no strictly comparable other experiences, there are lessons to be learned from elsewhere that may be judiciously applied to Kivalliq. Of primary interest in this regard are experiences in Nunavut with the Polaris and Nanisivik mines, in NWT with the diamond mines, and in northern Saskatchewan with uranium mining.

The section does not focus overly on employment and contracting results. For Polaris and Nanisivik and for the diamond mines in NWT, figures for Inuit or Aboriginal employment have been disappointing and there has been limited development of business, outside Yellowknife. The history of employment and contracting in northern Saskatchewan, and by Meadowbank, are more informative on the AREVA and Kivalliq experiences specifically, and are presented in the discussion for the potential for effects on community economies (see Section 8).

7.1 NUNAVUT

The Polaris and Nanisivik mines both closed, after 20 and 25 years of operation respectively, in 2002. The case of Nanisivik (near Arctic Bay) is better documented. The project involved a decision to build a town adjacent to the mine site – despite the presence of Arctic Bay less than 30 kms away – with the consequent challenges of how to dispose of the town when the mine closed. After 25 years of operation, Inuit employment had never exceeded 30% of a comparatively small workforce, equivalent to about 60 jobs. A study by the then named Baffin Region Inuit Association (cited in Cumberland, 2006) looked specifically at employment effects. Anecdotal opinion differed on the project's effects on employees, their families and the economy of Arctic Bay.

Subsequently, Brubacher and Associates (2002) qualitatively investigated the project`s socio-economic effects in Arctic Bay, in preparation for the mine's closure. Overall, qualitative information obtained during interviews with people in Arctic Bay was more positive than negative. The study concluded that the Nanisivik mine had positive direct, indirect and induced economic benefits and that the primary negative effects (aside from closure) were related to the abuse of alcohol and associated behaviours. With regard to other potential socio-economic effects (such as effects on traditional activities, family function, intergenerational relations and capacity building) different individuals reported different responses to the mine, some positive and some negative. With regard to the

last conclusion however, overall there appeared to be no net measureable effects that could be disaggregated in cause from other ongoing forces of change.

On the subject of closure, the study noted that negative effects included loss of income to individuals and businesses, loss of services and `uncertainty` with respect to the disposition of physical plant that represented a heavy investment on the part of the GN (equivalent to $45 million in current 2002 dollars). Loss of income was considered significant; however the study noted that comparatively few people and businesses depended on the project for most or all of their livelihoods. By closure, only 9% of Nanisivik workers was northern – most, but not all, of these were from Arctic Bay. Loss of services, particularly jet service and increased sea lifts using mine boats but also including mine site recreational facilities, was also considered a significant negative effect of closure by the people of Arctic Bay.

The study made a series of recommendations to GN, addressed to managing the effects of closure on Arctic Bay. The study also noted lessons learned, and consequent recommendations to both communities and governments with regard to future projects, all of which imply participation of a project proponent. These recommendations focus on open communication between all parties, monitoring of socio-economic effects, reporting on a project's commitments and effects, providing support staff in communities to facilitate the relationship between a project and affected people, implementing culturally appropriate mitigation and benefit enhancement measures, and providing training to better prepare Inuit for employment.

A qualitative comparison of the socio-economic effects of the Polaris (near Resolute Bay) and Nanisivik mines, on the basis of interviews on people's perceptions of impacts, was done by Bowes-Lyon et al (2009). Although the process for Polaris development was much improved over that of Nanisivik (environmental and socio-economic impact assessments were done before construction, and engagement on the potential for benefits and how to realize these was extensive), the overall conclusion was that economic benefits were not numerous at either mine and came to an end at closure. The limited economic benefits were attributed to little training of the (small) Inuit work force and few partnerships with businesses. Alcohol consumption was also thought to have increased by participants in interviews, in both Resolute Bay and Arctic Bay. However it is noted in this regard that at both mines the purchase of alcohol was 'unrestricted and unmonitored'.

The only long term socio-economic benefit identified in either community was that the education in the school at Nanisivik probably better prepared children for later employment than the school in Arctic Bay – in part because Inuit children schooled at the mine school had better English language skills. The study concluded that there were few lasting positive or negative effects as a result of either project, and no contributions to social development. The study also noted that neither project was held accountable

for failures to meet commitments. Recommendations were similar to those of Brubacher, focusing on engagement and training for both employment and contracting.

Newer mines in Nunavut (Tahera, Meadowbank and the construction phase of Doris North) have not operated for long enough to permit any conclusive analysis of socio-economic effects beyond uptake of employment, business and training opportunities. Meadowbank in particular has proved successful at enhancing economic benefits to Inuit.

7.2 NORTHWEST TERRITORIES DIAMOND MINES

GNWT, in partnership with BHP Billiton, Diavik and De Beers, has undertaken the only sustained quantitative effort in northern Canada to investigate and monitor mining's effects on a full range of socio-economic indicators in nearby communities. The first monitoring report, Communities and Diamonds, was published in 2002 and accumulated data have been reported in each subsequent report.

Table 7.2-1 presents in summary form the results of the Communities and Diamonds report on the year 2009 (GNWT, 2010). For purposes of the table, 'affected communities'[29] are the seven small communities in closest proximity to the mines and 'unaffected communities' are the other NWT communities excluding Yellowknife. Red cells (w) indicate a worsening trend, green cells (b) indicate a trend for the better and white cells (same) indicate no observable trend. The exception is the column headed 'trend associated to diamond mining', where it is indicated whether the observed trend is probably, possibly or not associated with mining.

[29] Behchokö, Gamètì, Whatì, Wekweètì, Detah, N'dilo, and Lutselk'e

Table 7.2-1Summary of Community and Diamonds Findings

Indicator	Predicted Trend in Environmental Assessments (A)	Trend in Affected Communities (B)	Trend Associated with Diamond Mining (C)	Trend in Unaffected Communities (D)	Relative Position of Affected Communities to Unaffected Communities (E)	Relative Movement to the Positive in Affected Communities (F)
Community, Family and Individual Wellbeing						
Potential years of life lost	w	b	possible	b	b	b
Injuries	w	b	none	same	b	b
Suicides	w	same	none	w	b	b
Communicable diseases (sexually transmitted)	w	w	possible	w	w	b
Teen births	w	b	none	b	w	b
Single parent families	w	w	probable	w	w	w
Children receiving services	w	w	none	w	w	w
Spousal assault	w	b	none	w	same	b
Total police reported crimes	w	w	possible	w	w	b
Violent crimes	w	same	possible	w	w	b
Property crimes	w	b	none	b	b	same
Federal statute crimes (includes drugs)	w	same	possible	w	b	b
Traffic crime	w	b	none	same	same	b
Other criminal code offences (often alcohol related)	w	w	possible	w	w	same
Home ownership	b	same	none	b	same	w
Crowding	b	b	probable	b	w	b
Core need	b	b	probable	same	w	b
Cultural Wellbeing and Traditional Economy						
Aboriginal language use (youth)	w	w	none	w	b	same
Trapping	w	b	probable	b	b	b

Hunting and fishing	same	same	probable	b	same	w
Nontraditional Economy						
Average income	b	b	probable	b	w	same
Wage disparity	w	b	none	b	w	b
Income assistance cases	b	b	probable	b	w	b
Employment rate	b	b	probable	same	w	b
Unemployment rate	b	b	probable	b	w	b
Participation rate	b	b	probable	same	w	b
High school completion	b	b	probable	b	w	b
Less than grade 9	b	b	none	b	w	b
Business activity	b	same	none.	b	w	w
Total (worse)	**17**	**6**	**n/a**	**10**	**18**	**5**
Total (better)	**11**	**18**	**n/a**	**15**	**7**	**20**
Total (same)	**1**	**5**	**n/a**	**4**	**4**	**4**
Total	**29**	**29**	**n/a**	**29**	**29**	**29**

Source: Derived from GNWT, 2010

There are a number of elements to note from Table 7.2-1:

- The socio-economic effects assessments for the three large diamond mines were more negative about the potential for negative effects in affected communities than has proven to be the case over the last decade, by a factor of almost three to one (compare columns A and B.)

- For the four indicators where both a negative trend has been observed in affected communities and the investigators concluded that a causal link with mining is plausible, the same negative trends are observed in unaffected communities (compare columns B and D). Only in the case of a single one of these four indicators (the percentage of single parent families) has the negative trend been stronger in the affected communities – that is, the percentage of single parent families has grown faster in affected than it has in unaffected communities (see column F).

- Prior to mine development, the affected communities were generally worse off than the unaffected communities with regard to indicators of wellbeing and

nontraditional economic activity, although they had stronger cultural indicators (see column E). However, in the last decade, the gaps for most indicators have been closing (see column F). The only exception is for hunting and fishing but in this case activity has stayed constant at a comparatively high level in affected communities while activity has increased, from a lower level, in unaffected communities.

- Column C indicates the report's conclusions on association between an observed trend and the diamond mines. Again with the exception of the percentage of single parent households, the strongest (probable) associations are related to employment and income. It remains very difficult to determine the degree to which mining affects wellbeing and traditional culture.

- With regard to specific indicators, the report's findings of particular relevance to the socio-economic effects assessment for the Project are:

    - The probable association between mining and the increase in the percentage of single parent families is related by investigators to the stresses placed on families of rotational work schedules.

    - Although one might expect an increase in children receiving services being associated with an increase in single parent families, changes to GNWT processes for providing services to children are believed to have encouraged – through less threatening processes – many parents to seek assistance when they wouldn't have before these changes were made. The investigators thus do not associate the increase in children receiving services to mining.

    - The increase in total crime in affected communities is attributed to a large increase in 'other criminal code offenses', primarily nuisance and mischief crimes, often motivated by alcohol abuse. All other crime rates appear to be improving or stabilizing. This trend is not general to unaffected communities – for example drug crime rates are stable in affected communities but are rising in unaffected communities.

    - Despite evidence of increased employment and incomes in affected communities, and despite what is thought to be associated improvements in housing conditions, the rates of home ownership are not increasing.

    - Earlier reports had associated mining with increased trapping, hunting and fishing and attributed this to increased incomes and thus affordability of traditional activity. Although trapping continued to rise in affected

communities as of 2009, hunting and fishing rates had stabilized. Hunting and fishing rates in unaffected communities continued to rise.

- Incomes are rising across NWT, at the same rate in affected as in unaffected communities. It may be that incomes wouldn't be rising as quickly in the affected communities as they now are in the absence of mining, but this cannot be proved. All other employment and education related indicators are rising faster in affected than in unaffected communities.

- Despite fears about mining wages increasing income inequality, not only is inequality decreasing (as measured for purposes of this monitoring), it is decreasing faster in affected communities.

- There has been virtually no business development in affected communities whereas there has been in unaffected communities. Affected communities may be considered to be ill suited to supplying the mining sector, being small and remote relative not only to Yellowknife but also to other NWT centres that are included in the unaffected group such as Hay River and Inuvik.

With regard to the above, it is emphasized that the data do not demonstrate the presence of absence of causal links between mining and the movement in indicators. The Communities and Diamonds reports consistently note the challenges of disentangling socio-economic change resulting from mining specifically as opposed to from other forces of change.

There are consequent uncertainties in coming to firm conclusions about the effects the large diamond mines are having. Preexisting and coexisting trends, changes in data collection methodologies and government policies and programs all confound interpretation of the data. The two groups, affected and unaffected communities, are not completely comparable. The oil and gas sector is having effects on 'unaffected communities' that are similar in some respects to the diamond mine effects on 'affected communities'. Finally, it cannot be known what would have happened in the absence of mining – where mining is unable to reverse a negative trend, it may have slowed it. For example, although communicable disease rates have increased in affected communities and the investigators see a possible association to mining, communicable disease rates have increased more quickly in unaffected communities.

It is also noted that there is not complete agreement on the approach used to try to capture some of the effects of diamond mines in the Northwest Territories. Gibson (2008) for example notes that effects on communities can be more profound than the

use of quantitative indicators are able to capture and that more effort is need to fully understand how people experience the diamond mines.

7.3 NORTHERN SASKATCHEWAN URANIUM MINES

The focus of formal socio-economic monitoring in northern Saskatchewan, through a partnership between AREVA, Cameco, GoS and communities, has been on reporting on the uptake of employment and business opportunities across the uranium mining sector as a whole. Since 1999, there has also been a process in place to look at and address issues at a community level, according to priorities the communities themselves identify (the Community Vitality Monitoring Partnership Process, CVMPP).

The CVMPP was established to identify and track indicators that provide insight in community vitality such that people can use that knowledge to improve and maintain the quality of life in northern Saskatchewan. This includes providing information related to uranium mining effects on community vitality that is useful to northern community stakeholders.

The process does not involve the regular collection and reporting of data however – existing organizations and programs collect and report data on many broad socio-economic indicators for northern Saskatchewan communities. Rather, the CVMPP coordinating committee is in ongoing consultation with communities to identify issues communities feel are of interest to better understanding wellbeing. The CVMPP then works with communities to put in place projects to respond to identified issues.

Although originally identifying five areas of focus (environment and land; health; economic/social/infrastructure; communication dynamics and relationships; and special topics – youth, outmigration and poverty), communities and CVMPP have increasingly come to focus on youth. Youth projects have included investigating challenges to getting postsecondary educations, and examining youth and community vitality issues such as justice, health and family. CVMPP's approach, that `monitoring is a developing process of addressing issues of concern rather than simply collecting data` (CVMPP, 2010), represents a quite different approach from that in, for example, NWT.

A review of projects that have been assisted by CVMPP (CVMPP, 2010) indicates that in the event, and despite part of its original mandate being to monitor mining effects, communities are in fact more concerned about existing threats to wellbeing that are not related to any negative socio-economic effects of mining. These include, as examples, examining the reasons people stay in and leave the north, tracking the high costs of a healthy food basket in remote northern communities and investigating how better to position youth to take advantage of mining economic opportunities. This in itself is an interesting result for what was originally conceived as a program to monitor mining`s effects.

However the CVMPP has also completed one study of interest to understanding potential effects of uranium mining in northern Saskatchewan, a study of the effects of rotational work on families and communities (Intergroup, 2005). It is noted that in some respects the population of northern Saskatchewan is comparable to that of Nunavut. As of 2006 there were about 30,000 people in northern Saskatchewan, about 85% of whom are Aboriginal. The region represents about 4% of Saskatchewan's total population, is remote and under serviced relative to the rest of the province and includes many communities experiencing important socio-economic challenges. The rotational work study results indicated that:

- a two week on two week off rotation was preferred – although people find the two weeks on somewhat difficult, overall they feel this is balanced by the two weeks off[30]

- spouses found rotational work more challenging to manage than workers did, and children could be negatively affected

- communication between workers and their families, including through site visits, was an important means to address rotational work challenges

- people preferred to address any work or family problems with friends rather than strangers, such as mine site counselors or EFAP staff

- more flexibility in work force management would allow people to better manage their time on the land and meet out of the ordinary family responsibilities such as emergencies

- participation in community events and volunteering were not significantly affected

- there needed to be more support in communities for wellbeing and the expectations of people were that both government and the mining companies could do more

The recommendations of the study were not to change work force management measures in any important regard but to provide 'more'. For example, more communication channels and more flexibility with regard to leave were recommended.

[30] This is a consistent finding with regard to many people who are able to manage rotational work, as evidenced by AREVA`s socio-economic data collection results and, for example, Gibson, 2008.

However it was also clear that rotational work has its costs on families and more culturally appropriate support services were required in this regard.

8 ASSESSMENT OF EFFECTS ON COMMUNITY ECONOMIES

Effects on community economies will largely be driven by opportunities the Project will create for employment and contracting. As noted in Section 6, Socio-Economic Management, AREVA will put in place measures to increase the capacity of people in Kivalliq to take advantage of these opportunities, including a range of education and training initiatives. To the extent that economic opportunities can be taken up by people in Kivalliq, there will also be economic growth and diversification in at least some communities, incomes will increase and some people can be expected to migrate.

Not all positive effects will necessarily be immediately seen in their full potential, but are expected to gain momentum with time. It is noted that the construction and now operations of Meadowbank has prepared some of the ground for growing capacity in Kivalliq region to supply labour, goods and services to the mining sector. With regard to negative effects, most of these are expected to become evident in the transition first into construction and then into operations. With time then, negative effects are expected to moderate as people and the economy adjust to the Project.

A complicating factor in the assessment of residual effects on community economies is that rapid growth in the labour force is ongoing and is expected to continue for some time, well into the Project's construction and operations phases. What now may appear to be a comparatively tight labour market, specifically for recruitment of people both willing and able to take up rotational employment, has potential to change dramatically over the interim until the Project begins construction. The degree of change will depend on job creation – to the extent that job creation does not advance as quickly as labour force growth is the extent to which the labour market can be expected to loosen. The degree of change will also depend on educational levels of new entrants to the labour market. There is evidence that high school graduation rates are increasing, thus new entrants to the labour force are expected to have higher educational achievement than has been the case in the past.

Job creation will be strongly affected by progress with the Meliadine and Mary River projects over the interim to AREVA's expected start of construction in 2017. The available information on Meliadine suggests that the project will be comparable in size to Meadowbank (AEM, 2011b). Although Mary River is in Qikiqtaaluk Region, the enormous size of that project implies very high demand for Inuit labour, goods and services, demand that has potential to spill over into Kivalliq Region. Labour market conditions in 2017 will in large part depend on whether or not either or both of these projects move into their construction phases before the Project does.

8.1 RESIDUAL PROJECT EFFECTS ASSESSMENT ON COMMUNITY ECONOMIES

8.1.1 Analytical Methods

The analysis of employment, contracting and income effects has been somewhat quantified on the basis of patterns of Inuit participation in various projects to date, the Project feasibility study data on AREVA's expected work force size and skill requirements, and baseline conditions and trends regarding population and labour force size and growth rates, participation rates and educational achievement.

Scenarios are developed to demonstrate potential residual employment effects. Table 8.1.1 shows the primary assumptions used in this scenario building. The sources of the figures are listed below the table. It is noted that the values in the table are considered conservative, that is, they understate what actual values will be. By mid-2011 for example, the population of Nunavut was already larger than projected (GNBS, 2011b).

Table 8.1-1 Values Available, Calculated or Estimated for Scenario Building

	2006	2010	2011	2017	2021
A Population	8,718	9,479	9,560	10,590	11,351
B Population annual growth rate (%)		2.1	1.6	1.7	1.8
C Population 15 to 64 years	5,754	5,881	5,999	6,623	7,384
D Participation rate (%)	62	65	65	65	65
E Labour force	3,567	3,823	3,899	4,305	4,800
F Labour force annual growth rate (%)		2.9	2.2	2.3	2.3

Sources:
A Actual for 2006 and 2010 and projected for 2017 forward (GNBS, 2011b).
B Calculated from A.
C Actual for 2006 (Statscan, 2007a) and 2010 (GNBS, 2011b), estimated on the basis of a 2% annual growth rate for this age group for 2011 forward.
D Actual for 2006 (Statscan, 2007a), estimated on the basis of current participation rate in Nunavut for 2011 forward (GNBS, 2011a).
E Calculated from C and D.
F Calculated from E.

Contracting opportunities and expectations for Inuit access to these can be quantified; however residual effects will depend on a number of factors relevant to the capacity of business to access opportunities – including, importantly, availability of workers and developments of joint ventures. The assessments of education and training effects, indirect and induced economic effects and income effects are necessarily also largely qualitative. In migration from outside Nunavut is not considered a likely source of population growth however mining projects do

create opportunities for people to move between communities, including to communities outside Kivalliq. Numbers cannot be estimated, thus the discussion of migration effects is qualitative.

Increased economic opportunities are considered in this section to largely represent benefits, in and of themselves. This is not to imply that there are no consequent negative effects, such as effects on traditional culture, community wellbeing and public infrastructure and services. Such effects are addressed in subsequent sections of this assessment.

8.1.2 Employment

Construction

The Project's direct construction phase employment is expected to be predominantly by construction contractors, of which the largest will be southern based companies with their own established, skilled work forces. Skill sets required are different at different times over the course of a large construction project, thus many skilled jobs are short term. The high financial cost of construction phases, with no return on capital investments until mine production begins, forces very tight schedules with fewer opportunities for on the job training than is characteristic of mining project operations phases.

These conditions are inherent in mine construction. The major implication of these conditions as regards the employment of people in Kivalliq is that most employment is expected to be employment of people with unspecialized skills. The advantage however is such employment – catering, security and cleaning for example – can be continuous throughout the four year construction phase.

Work force requirements for construction will vary over time, but will average about 750 and peak at about 1,200. It is conditionally estimated that in the order of 15% to 20% of these jobs will require unspecialized skills (representing up to 150 jobs on average and up to 240 at peak). Skilled workers would also of course be offered employment to the extent that such workers are available. There are experienced construction workers in Kivalliq. In 2006 almost 200 people identified themselves as construction workers specifically and over 500 people had experience in trades, transport and equipment operations (Statscan, 2007a). Numbers have surely increased in the last five years.

Table 8.1-2 provides data on Inuit participation in mining projects in Kivalliq to date and includes AREVA data on the northern Saskatchewan experience. The table indicates that a 20% Inuit work force is a conservative estimate of what is achievable, based on past experience. Most hiring by Agnico Eagle had been in Baker Lake in the past, although as the labour market has tightened there Agnico Eagle is now recruiting in all Kivalliq communities – as of early 2011 just over 50% of Meadowbank's work force was from communities other than Baker Lake. Most of these newer workers were from Arviat and Rankin Inlet however Agnico Eagle has hired at least some workers from each of the smaller communities (AEM, 2010).

Table 8.1-2 Recent Employment Data

	Total employment	Local employment
Meadowbank construction, 2007/2008		
no.	612	132
%		22
Meadowbank operations, 2011		
no.	1,114	270
%		24
AREVA Project exploration, 2010		
no.	64	25
%		39
AREVA and Cameco, various Saskatchewan construction and operations, 2010		
no.	3,200	1,565
%		49

Sources: AEM, 2011a and 2010; AREVA internal data.

Note: Local employment refers to Inuit employment in Nunavut and to northern Saskatchewan employment in Saskatchewan.

AREVA expects that 150 construction phase jobs will to be taken up by people in Kivalliq, which represents 30% of the about 500 unemployed in 2006 (Statscan, 2007a). However, it should be noted that not all these unemployed are still unemployed (or will be unemployed in 2017) and be both willing and able to take up rotational work.

First, available labour force data at the regional and community level are only available for 2006, and do not reflect Agnico Eagle's hiring since 2006, which now approaches 250 people from Kivalliq. Data from tax files[31] in Table 8.1-3 show that 320 more tax filers reported earned income in 2008 than in 2006, about two thirds of whom lived in Baker Lake. Thus the increase in

[31] Tax file data provide good coverage in Nunavut (over 93.9%, Statscan, 2010), in part because even for those with no to very little income filing tax returns is needed in order to claim the GST credit.

the percentage of people reporting earned income is a good measure of new employment.[32] So, despite a growing labour force, the total number of unemployed would be now be expected to be substantially lower than the 500 unemployed in 2006.

Table 8.1-3 Tax Filers Reporting Earned Income

	No. of tax filers in 2006	Percent change			Added tax filers 2006 to 2008
		2006 to 2007	2007 to 2008	2006 to 2008	
Arviat	800	0.0	1.3	1.3	10
Baker Lake	690	14.5	11.4	27.5	190
Chesterfield Inlet	200	0.0	5.0	5.0	10
Coral Harbour	330	0.0	3.0	3.0	10
Rankin Inlet	1,220	1.6	4.0	5.7	70
Repulse Bay	350	-8.6	12.5	2.9	10
Whale Cove	160	0.0	12.5	12.5	20
Kivalliq	3,740	2.4	6.0	8.6	320

Source: GNBS, 2011e

Second, on grounds of efficiency and of health and safety, there will be minimum language and education requirements to work for the Project. The work language will necessarily be English and basic literacy will be required. Given the considerable evidence that employment rates are correlated with educational achievement (for example GNBS (cited in Cumberland, 2006), which looked specifically at the correlation between education and employment in Nunavut), many of the unemployed are expected to have low to very low educational levels that may exclude them from employment with AREVA.

Thirdly, Agnico Eagle's experience suggests that rotational work has proven quite challenging for many. At Meadowbank turnover rates have been high. This is not because of dismissals. Agnico Eagle reported to the Kivalliq SEMC (AEM, 2010) that of over 223 terminations in 2008 to 2009, only three were dismissals. A further 100 were because contracted short term work had come to an end. The balance, over 50% of all terminations, was voluntary resignation. Different reasons were given, including child care difficulties, spousal need and just not liking the work.

[32] It is however not an exact measure. For example, two people could work at the same job but over different time periods. Both might newly report earned income however this would be earned at only one job.

AREVA's focus group discussions suggest that for those who do stay employed, taking up rotational work is the trade-off they have chosen for secure employment at good wages. Long work days and isolation from family and community were reported as stressors. The seasonal pattern of Meadowbank resignations – there is a spike during the spring – also suggests that people would prefer to be on the land at least at this time of year.

Finally, the discussion above is general to the labour force and does not take into account that rotational mines continue to have difficulty attracting female employees. Despite efforts to attract and retain female employees, AREVA achieves only 15% female representation at McClean Lake and Agnico Eagle 30% at Meadowbank.

These four factors – decreasing numbers of unemployed, limited educational achievement, challenges of rotational work and limited participation by women – might suggest that AREVA could have some difficulty in identifying workers from Kivalliq. However, there are at least four countervailing factors.

First, large numbers of people have entered (and will continue to enter) the labour force since 2006. Table 8.1-4 provides an indication of potential new entrants to the labour force by 2017 (and by 2021), using population by single year age for Nunavut (see column A) as the basis for calculating population by single year for Kivalliq (see column B, calculated at an assumed 29% of Nunavut's population[33]) and new entrants to the labour force (see column C, calculated at an assumed participation rate of 65%[34]). People will also leave the labour force during these years so new entrants do not all represent labour force growth, that is labour force growth is not expected to be as high as almost 900 people by 2017. If we assume a (conservative) annual labour force growth of 2.3% annually,[35] only about 500 people would be added to the labour force over the period to 2017. The actual number of people for whom jobs will need to be created is likely between 500 and 900.

[33] About 29% of Nunavut's population was in Kivalliq in 2010. Kivalliq's population is growing faster than Nunavut's however, thus 29% is conservative.

[34] This is the current participation rate in Nunavut. Participation rates tend to increase with increases in employment opportunities, thus 65% may be considered conservative.

[35] See Table 8.1-1.

Table 8.1-4 Kivalliq Labour Force Growth Rate Scenario

Age		A Nunavut	B Kivalliq	C Kivalliq New Entrants
17	18 years and over by 2017	624	181	118
16		695	202	131
15		682	198	129
14		669	194	126
13		665	193	125
12		686	199	129
11		680	197	128
Subtotal (new entrants by 2017				886
10	18 years and over by 2021	713	207	134
9		685	199	129
8		647	188	122
7		676	196	127
Subtotal (new entrants 2018 to 2021)				513
Total (new entrants by 2021)				1,399

Source: Calculated from GNBS, 2011a

There will be job creation in Kivalliq over the coming decade – not all of these people can expect to be unemployed and available for work at the Project of course. However Table 8.1-4 does confirm that the concerns of both government and people about the availability of jobs for large numbers of youth newly joining the labour force are well founded.

Secondly, people may choose to move from part time and seasonal to full time/full year work. There are no data to indicate the degree to which workers choose or must accept part time and seasonal work. However over 50% of people with earned income in Kivalliq in 2006 did not work full time for a full year, equivalent to over 1,600 people. Some of those would choose to work full time/full year if they could. The time that part time and seasonal workers who want to work fulltime/full year, but currently do not, represents additional labour force availability.

Thirdly, there are hopeful signs that the young are responding to improved economic opportunities by completing high school – high school graduations in Kivalliq have doubled since 2000, to 83 graduates in 2010 (NAC, 2011). These graduates represent more than 45% of

18 year olds in Kivalliq in 2010. If the 1,350 children who will reach 18 years over the coming six years graduated at a rate of 45%, this would be about 600 graduates. Not all of these graduates will enter the labour force immediately – some of will move on to postsecondary education and enter the labour force later, and some will choose not to work.

Fourthly, employment at good wages is expected to attract some of the more than almost 1,600 workers (in 2006) who are already fully employed. While this does not have any effect on available labour, such people are a source of workers and create opportunities for others to take up the jobs they have left.

There are also additional factors that can affect worker availability to the Project. As noted in Section 6, Socio-Economic Management, AREVA expects to investigate, as it hires Inuit, options for flexible work force management that may make it easier for people to take up, and stay with, rotational employment. As well, participation rates could rise in face of more employment options.

There are thus a host of factors that will influence the availability of labour as this develops over the interim to 2017. On balance, it is expected that AREVA will have no difficulty in achieving at least 20% Inuit work force, although there is some potential for this to involve people leaving jobs to take up employment with AREVA (see Section 8.1.4 below).

As an illustration of the potential for effect on unemployment rates in communities, Table 8.1-5 develops a community level scenario. The scenario is based on 2006 census data on the labour force size and employment, the last year for which there are data available at a community level (Statscan, 2007a).

Table 8.1-5 Employment Scenario, 2011 and 2017

	Arviat	Baker Lake	Chesterfield Inlet	Coral Harbour	Rankin Inlet	Repulse Bay	Whale Cove	Kivalliq
2006								
Number employed	535	535	140	250	1,010	180	90	2,740
Number unemployed	80	125	25	60	115	95	10	510
Labour force size	615	660	165	310	1,125	275	100	3,250
Unemployment rate (%)	13.8	18.9	15.6	19.4	16.2	35.2	10	15.7
2011								
A Labour force size	705	756	189	355	1289	315	115	3,724
B Number unemployed (at 2006 rate)	97	143	29	69	209	111	11	585
C Meadowbank employment	49	133	6	6	34	5	2	235
D Revised number of unemployed	48	10	23	63	175	106	9	350
E Unemployment rate (%)	6.8	1.3	12.4	17.7	13.6	33.6	8.3	9.4
2017, no interim new job creation								
F Labour force size	808	867	217	407	1,477	361	131	4,268
G Number unemployed	151	120	51	115	363	152	26	894
H Unemployment rate	18.7	13.9	23.6	28.2	24.6	42.1	20.0	20.9
I AREVA employment scenario	30	30	10	20	30	20	10	150
J Number of unemployed with AREVA employment	121	90	41	95	333	132	16	744
K Unemployment rate with AREVA employment (%)	15.0	10.4	19.0	23.3	22.6	36.5	12.3	17.4

Sources: Statscan, 2007a for 2006 data.

Note: GNBS considers that the 2006 census undercounted in Nunavut and has revised the data upwards for purposes of reporting data that are the basis of Table 8.1-1. The data in the two tables are thus not strictly comparable. Statscan data were needed to construct this table because there are no other comparable data at the community level.

Applying a 2.3% annual increase to the 2006 numbers gives labour force size estimates for 2011 (see row A). Applying the 2006 unemployment rate to the 2011 labour force numbers gives a first indication of what the number of unemployed in 2011 might be (see row B). However, as noted above, community unemployment rates from 2006 do not take into account the effects of Meadowbank, whose operations phase had added at least 235 jobs[36] to Kivalliq as of mid-2011, distributed across communities as shown in row C.

The consideration of these Meadowbank jobs produces a lower number of unemployed (see row D) and a lower unemployment rate (see row E). By 2017, the labour force will have grown again (see row F), as will the number of unemployed (see row G), giving an unemployment rate in the order of what is in row H.[37] It is of course unknown at this point which communities AREVA's workers will come from in detail, but if they were distributed very roughly according to population size, the distribution might look something like that in row I. AREVA's employment would reduce the number of unemployed (see row J), giving an unemployment rate in the order of what is in K.

Comparing the estimated unemployment rates in 2017 without (see row H) and with (see row K) with the addition of AREVA jobs will show that unemployment rates would fall by 3.5% at a regional level. Decreases in employment rates in communities will depend on the eventual distribution of jobs, however it is clear from the table that important decreases can be achieved with comparatively small numbers of added jobs.

The other point to note is that even though the estimates of unemployment rates in 2017 in rows H and K are considered high because they do not take into account any other job creation in the economy (including in the case of row K, AREVA related indirect and induced employment), they are up to double the estimated unemployment rates in 2011. That is, unemployment can be expected to increase in Kivalliq by 2017 as compared to 2011, but will increase less with AREVA employment.

Figures 8.1-1 and 8.1-2 show the potential effects of AREVA jobs on unemployment rates more visually. The first figure shows what could happen by 2017 if no new entrants to the labour force found employment (the scenario in Table 8.1-5). The second figure shows what could happen by 2017 if all new entrants found employment. In the first instance unemployment would rise until 2017 and fall back with AREVA employment, by 3.5%, to an unemployment rate of 17.4% at the regional level. In the second instance, unemployment would continue to fall to 2017, and

[36] This is a conservative estimate as it does not consider induced employment effects on particularly Baker Lake, which has seen most Meadowbank employment and Rankin, as well as AREVA related activity since 2006.

[37] The unemployment rates in row H and row K are considered high because they do not take into consideration other job creation over the period 2011 to 2017.

fall further with AREVA employment, also by 3.5%. In the second case however, unemployment would of course be much lower, at less than 5%.

Figure 8.1-1 Unemployment Rates, 2011 and 2017 (no new entrants finding employment)

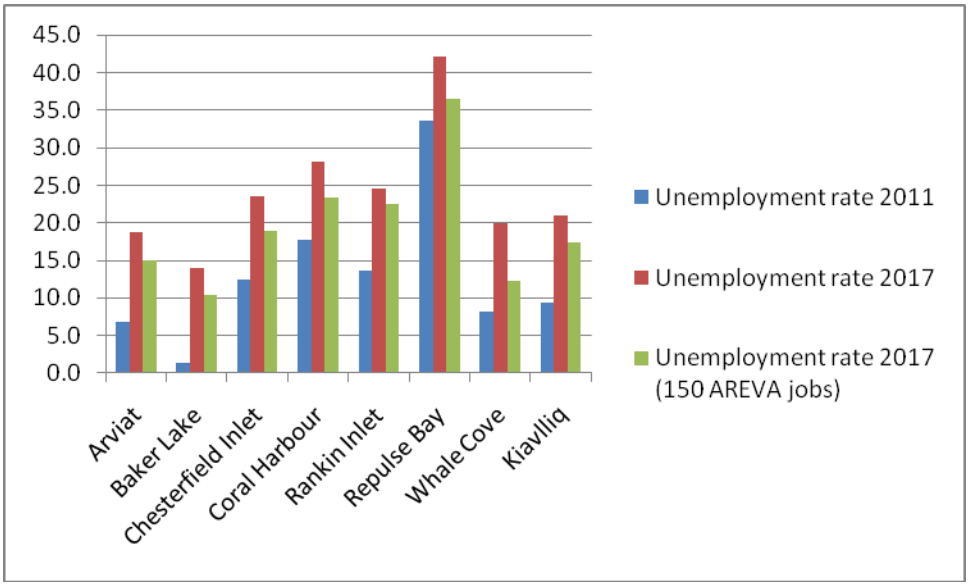
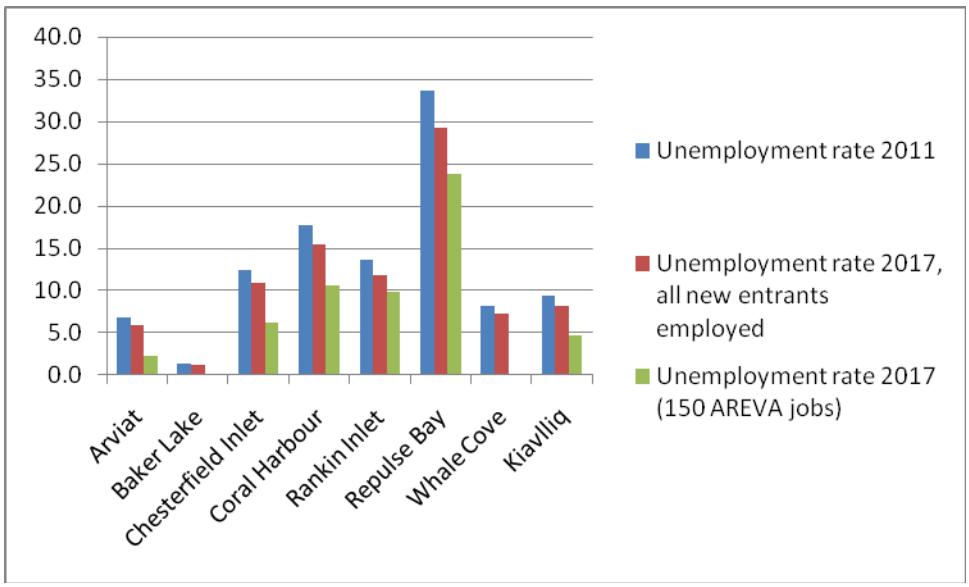


Figure 8.1-2 Unemployment Rates, 2011 and 2017 (all new entrants finding employment)



It is emphasized that the table and figures are not to be considered predictive, particularly at a community level. What actually will happen will be somewhere in between – unrelated to AREVA, there will be some job creation and some new entrants will find jobs. If Meliadine and Mary River are in construction by 2017, the labour force statistics would look quite different,

perhaps closer to Figure 8.2-2 than to Figure 8.2-1. Further, the results are only presented for 2017. Reference back to Table 8.1-4 will indicate that between 2017 and 2021, there will be about 500 additional new labour force entrants.

Thus the table and figures are only intended as a demonstration of the kind of effects on unemployment rates that 150 additional jobs can bring about were those 150 jobs added to the Kivalliq economy in 2017. It will be noted that in Baker Lake and Whale Cove the scenario in Figure 8.1-2 produces zero unemployment, a very unlikely outcome.

Operations

AREVA's work force requirement for the operations phase is estimated at 550, and the demand for unspecialized people for this phase will also likely approach 150. As well, AREVA will prepare for the operations phase by training up to 120 people at educational institutions in Nunavut and its mining operations in Saskatchewan, that is, up to 120 people will be trained up to at least a semi-skilled level for employment at the Project. Thus there is potential for total Inuit employment of about 270 people, approaching 50% of the work force.

It is expected that the same constraints, as described for the construction phase in Section 8.1.1, will apply during operations, some trainee attrition is expected and as a uranium mine, as opposed to a construction site, labour force skills will need to meet more stringent standards. So it is unlikely that a 50% Inuit work force will be achieved early in the operations phase. It is also expected that by the time operations begin in 2021 the employment situation in Kivalliq will have changed substantially in face of competing demands for mining workers not only in Kivalliq but across Nunavut.[38]

As the same constraints apply, so do the opportunities. The labour force will continue to grow, and there are expectations that so will educational achievement of new entrants. In addition, learning experience and adaption of work force management policies to Inuit needs should make it easier for people to take up rotational employment over time. Thus AREVA does expect that with time a 50% Inuit workforce will be achieved.

Constructing community scenarios for 2021 similar to those for 2017 becomes overly speculative, however the same relationships apply – unemployment rates will decrease as a result of The Project in proportion to hiring in each community. Reference to Table 8.1-1 will suggest that the labour force in Kivalliq has potential to increase by at least 2.3% per year over

[38] Section 13, Assessment of Effects on the Economy of Nunavut, addresses future developments in the mining sector in Nunavut. The growing skill levels of both labour and business, specific to mining, in Kivalliq is expected to result in hiring in Kivalliq for other projects in Nunavut, of which there are at least six (in addition to the Project) which might be expected to be in operation by 2021.

the period 2011 to 2021, to 4,800 people. Two hundred and fifty jobs represent 5.3% of the expected labour force in 2021. Thus The Project employment can be expected to reduce the unemployment level by over 5% in that year.

Secure, long term employment has both individual and community level effects. With the exception of hamlet government, experiencing challenges in delivering services, specific comments from interviews and focus group discussions about the effects of Meadowbank on Baker Lake were virtually all positive.

Box 8.1-1 Meadowbank Effects on Baker Lake

Comments on the experience of employment:

- feel differently about ourselves from having jobs
- have been able to earn and save money and spend it wisely
- are happier and less stressed (no bills) and so are spouses and kids
- met lots of new and interesting people (including from the south)
- learning a lot on the job
- known and respected in town
- more self-confident and able to solve problems
- more independent and able to do what is right

Children have a brighter future in Baker Lake than in other Kivalliq communities.

The mine has been good for Baker Lake. Lots of people are working now, so that is very good.

Lots of Inuit are working now which is very good and a high percentage are keeping their jobs.

Workers are mostly buying equipment to go hunting. Hunting is enjoyable and provides food to households.

Being able to buy boats, cars and snowmobiles, allows people to hunt and fish more than before.

The Inuit are starting to build/buy their own homes. Baker Lake Contracting and Supplies has built 20 new houses for the private market and will continue to build new ones.

The hamlet is finding it difficult to ensure water and sewage services because the population is growing, and the demand for water has gone up because people use more and more water.

8.1.3 Contracting Opportunities

As for the labour force, the capacity to supply goods and services to the mining sector is rapidly evolving in Kivalliq. Existing businesses are expanding and new businesses and joint ventures are being formed in response to the economic opportunities offered by Meadowbank and ongoing active exploration. This is expected to continue over the interim until AREVA's planned construction start date in 2017, as progress with Meliadine and Mary River will provide additional stimulus to business development.

Historical data on expenditures on goods and services in Nunavut is provided in Table 8.1-6. The data suggest that in the recent past, in the order of 20% of expenditures of Cumberland Resources (previous owner of Meadowbank), Comaplex (previous owner of Meliadine) and Agnico Eagle have been spent in Nunavut, almost all of it in Kivalliq with NTI registered companies.

Table 8.1-6 Historical Expenditures on Goods and Services

	Total expenditures	Regional expenditures	Local expenditures
Cumberland Meadowbank development, 1995 to 2003			
$	30	na	7
%		na	23
Meliadine development, 2003 to 2009			
$	76	na	15
%		na	20
Meadowbank construction, 2007/2008			
$	512	171	na
%		33	na*
Meadowbank construction and operations, 2007 to 2010			
$	969	237	227
%		24	23
Meadowbank operations, 2nd quarter 2010			
$	na	31	31
%		na	na
AREVA Project development, 2007 to 2010			
$	49	12	na
%		24	na
AREVA and Cameco, various Saskatchewan construction and operations, 2010			
$	916	618	361
%		67	39

Sources: Cumberland, 2006; AEM, 2011a and 2010; AREVA internal data.

Note: For Nunavut projects, regional = Nunavut and local = Kivalliq; for Saskatchewan projects, regional = Saskatchewan and local = northern Saskatchewan.

AREVA's purchases of goods and services over the period of the exploration and development phases of the Project have included fuel supply, catering, accommodations, environmental, transport and drilling services. A total of about $12 million has been paid out in Nunavut for goods and services. This total represents about 24% of the estimated $49 million in total exploration and Project development expenditures to date.

It will be noted in the above table that AREVA/Cameco purchases in Saskatchewan and northern Saskatchewan are higher than anything yet achieved in Nunavut. Part of this, particularly the figure for northern Saskatchewan, is certainly attributable to the long history of uranium mining there and the industry`s success in motivating supplier responses to contracting opportunities. Over time, with increasing experience of business with the uranium and with benefit enhancement measures put in place by AREVA, Cameco and government, there has been upward pressure on the percentage of total expenditures in northern Saskatchewan. As mining further establishes itself in Kivalliq, there will similarly be growing capacity on the part of business to meet the needs of large mining operations.

It is to be noted that the figures in Table 8.1-6 are only for expenditures invoiced in Kivalliq and Nunavut. As such, they will be reflected in such economic statistics as business expenditures and final domestic demand, but only partially reflected in GDP growth. The Conference Board of Canada (CBoC, 2001) has pointed out and public accounts continue to confirm, that leakage is high. This means that about half of dollars expended in Nunavut find their way outside the territory, through federal taxation, incomes spent on imports of southern goods, and business expenditures on supplies and labour to meet contractual obligations. The figures in Table 8.1-6 therefore overstate the real economic boost to communities, which will largely derive from wages for Kivalliq residents that businesses hire to meet contract requirements and on business profits that are reinvested in Kivalliq. CBoC estimated leakage in Nunavut due to consumer expenditure patterns at 53 cents on the dollar – leakage of business expenditure would be higher.

AREVA`s total construction expenditures on contracted goods and services are expected to reach $1,200 million[39] over a four year period. If AREVA achieves at least 20% of these expenditures in Kivalliq, this represents about $240 million, or an average of about $60 million per year. Total operational expenditures on goods and services are expected to be in the order of $145 million per year over the period 20021 to 2035. Again, if 20% of these expenditures were spent in Kivalliq, this would be about $30 million annually.

Based on Nunavut's GDP and Kivalliq's population, it is likely that the Kivalliq domestic product was in the order of $300 to $350 million in 2010 and total demand in the regional economy

[39] All AREVA spending estimates are in 2010 dollars.

about twice that.[40] AREVA's expenditures would represent 10% and 5% of total demand in 2010 for the construction and operations phases respectively, but smaller percentages in future years as the Kivalliq economy grows.

Again it is noted that these figures are indicative of potential rather than predictive. Although capacity on the part of businesses to respond to mining sector requirements is clearly expanding in Kivalliq, so is demand. Rapid expansion in face of rapidly increasing demand will require capital, workers and management systems that may take some time to develop. Response to a combination of demand from Meadowbank, The Project and Meliadine may be challenging to achieve. Although Mary River is not in Kivalliq much of Inuit capacity to supply large projects is now within Kivalliq – a drive for Inuit content from by Mary River could represent additional demand in Kivalliq. As well, business has as yet little experience with uranium mining needs specifically, which could constrain response.

With regard to distribution of contracting opportunities among communities, all indications are that most will be seen in Baker Lake and Rankin Inlet – 70% of Kivalliq's NTI registered businesses are in these two hamlets, including those that have been most contracted to date by Agnico Eagle and by AREVA during its exploration phase. Baker Lake and Rankin Inlet are also in closest proximity to many foreseeable mining projects. Baker Lake is in closest proximity to two thirds of exploration projects in Kivalliq. Rankin Inlet is the regional hub. As supply to the mining sector becomes more competitive, Baker Lake and Rankin Inlet have cost advantages that other communities do not have.

8.1.4 Training

AREVA acknowledges that achieving the potential effects described above will, in some part, depend on labour force and business education and training. It is also noted in this regard that consultation results indicate strong Inuit interest in training, motivated both by the understanding that training will be needed to access mining jobs but also by rapidly increasing training opportunities put in place in Nunavut, as opposed to in southern Canada, by GN. Business are also eager to develop capacity in order to take advantage of contracting opportunities, as evidenced by the number of joint ventures that have been formed with southern companies. As noted in Section 6, Socio-Economic Management, AREVA's planned interventions in education and training include not only initiatives to meet the Project's work force and supplier needs, but also broader based initiatives to encourage children to stay in school and to work with educational institutions to increase mining sector content in curricula.

[40] There are no data on the size of the economies of Nunavut's regions. Very approximate estimates can be calculated from Nunavut's per capita income, adjusted downward for Kivalliq`s population size and lower incomes.

It is AREVA's policy, and has been practice over the exploration and feasibility phase of the Project, to provide on the job training to employees. Such training is intended both to improve skills towards improved job performance and promotion and towards broadening the skill base of employees such that new or strengthened skills can be applied elsewhere in the economy. Job experience and training in heavy equipment operation and maintenance, construction trades (including electrical, plumbing and carpentry training), catering, environmental studies, health and safety, computers and information technology, and accounting and clerical work – even if provided in a mining sector context – is transferable.

There is some potential for such on the job training during construction, for example for people in support positions to construction trades and equipment operation work, such as for catering and office workers. However most on the job training will take place over the operations phase, as the Project builds to a 50% Inuit permanent workforce. In addition, AREVA expects to offer training and job experience at its mine site in northern Saskatchewan to Kivalliq people during the construction phase, to prepare them to work at the Project during the operations phase.

On the job training brings multiple benefits. It enhances job performance and enables both promotion of people trained and the subsequent opening up less skilled position to new workers from communities. It is this process that allows AREVA to expect to increase the numbers of Inuit employees over the early years of operations. On the job training of Inuit supervisors is expected to enable at least some work crews to work in Inuktitut at some point, potentially both widening the pool of available labour and enhancing job satisfaction. As noted above, many mining skills developed through Project specific training are transferable – AREVA trained workers whose personal circumstances change, making rotational work less preferred, will bring skills back into communities, working better at hamlet jobs and, for example, at jobs with businesses serving the mining sector.

Beyond on the job training however, AREVA will also provide assistance to those who wish to develop the skills which can better position them for the Project employment and contracting. Such assistance would include pre-employment programs, educational institution based programs such as apprenticeship and technician programs, and training for businesses. Agnico Eagle's participation in the Kivalliq Mine Training Society (KMTS) has some potential to serve as a model although it is not known if this initiative will still be ongoing, or needed, six years from now. The specific objective of the KMTS is to enhance the capacity of the people to work for Agnico Eagle, or other mining sector employers, at levels beyond the unspecialized skilled jobs many may only be qualified for initially.

AREVA`s thinking on education and training initiatives has a second dimension. As noted above, the young of Kivalliq are struggling to stay in high school, and although graduating numbers have improved remarkably over the past five years, graduation rates are still well below Canadian averages. It also was clear during consultations and data collection that even as some children may be moving away from interest in traditional activity some of these are not, as a counter measure, succeeding at finding a secure place in the wage based component of the economy. The fear is that some children have shrinking livelihood options.

Accordingly, education and training initiatives will be developed by AREVA, in association with governments, education authorities and communities, with a view to enhancing educational achievement levels in Kivalliq. The emphasis would be on motivational, lifestyle, curriculum[41] and financial issues related to getting children through high school and continuing on to postsecondary education. Such measures would be intended to contribute to encouraging a commitment to education on the part of youth and to provide the tools these children need to succeed at this commitment. To the extent that children stay in school and graduate, and more proceed to postsecondary education, including training as teachers and health staff, this will also contribute to GN goals of providing more services to Inuit in Inuktitut, and of increasing the representativeness of government workers.

In face of ongoing changes in both the delivery and uptake of education, the detail of such measures will necessarily depend on needs as these are identified closer to the start of construction. It is also noted that, in addition to training, simply gaining experience on the job and in contracting to meet the supply needs of the Project further enhance capacity in the labour force and in businesses. Preferential employment and contracting, and education and training, are mutually reinforcing.

8.1.5 Economic Growth and Diversification

Direct Project expenditures on goods and services will be large relative to the size of the Kivalliq economy. In addition, there will be indirect and induced economic effects. Indirect effects occur when businesses are contracted to supply the Project and require new employees to meet contractual obligations. An example from Baker Lake might be the increased activity in the hospitality sector, at least in part as a result of mining project associated visitors in the hamlet. As well, with increasing direct and indirect economic activity, individuals and business will be spending increasing incomes on goods and services. This in turn will induce more employment, and perhaps more small businesses, as people in communities organize to provide additional goods and services demanded by others with new disposable income.

Additional income may be spent for example on renovations to housing, increased travel, new household appliances, vehicles that will require maintenance, and other consumer items. This process of direct economic effects feeding back into community economies represents both economic growth, and diversification as consumers change spending patterns. The best examples are in Baker Lake, where there is now additional demand for private housing and business has organized to meet that new demand; and in Rankin Inlet where its economic advantage as the regional hub has meant more goods and services are available here than, for example, in the bigger hamlet of Arviat.

[41] Curriculum issues include, as examples, learning methods, content children feel that is relevant to their adult lives and opportunities for traditional studies.

Section 13, on the Project effects on the economy of Nunavut, suggests that such indirect and induced effects would be large. Because the Project's employment and contracting is expected to be very predominantly in Kivalliq, most of these indirect and induced economic effects would be seen in this region. Even taking into account that many indirect jobs will have skill requirements that may not be easily met initially, a conservative interpretation of the territorial economic effects suggests that at least as many indirect and induced jobs would be created for Kivalliq residents as direct jobs during construction (150 jobs) and operations (250 jobs). That is, the employment effects described in Section 8.1.2 would be effectively doubled. Income effects (see Section 8.1.6) however are likely to be less than double, as wage rates in community economies are not expected to be as high as those paid by AREVA.

It is true however that rapid economic growth can have negative effects. Because over half of what Nunavut consumes comes from southern Canada, inflation is in large part dependent on inflation in Canada more generally. However increased demand for labour usually implies increasing wage rates for those with skills that are in short supply, which are inflationary. Inflation harms particularly people who are unable to access jobs in the expanding labour market for whatever reason. Such people would include some of the more vulnerable in communities – elders and single parents (primarily women) and their young children for example. Increased wage rates however are a benefit to those who work for those wages.

Increasing wage rates also imply additional costs to businesses and hamlet governments and, at the limit, inability to offer services in face of labour shortages. The potential for full time/full year employment, with associated opportunities for training and career advancement, will be an incentive for some workers to leave current employment (or underemployment). Employment at the Project may be preferred by some of the already employed and it is in the Project's interests to try to attract particularly the more highly skilled already employed, both to maximize Inuit employment and to effectively operate. The departure of workers from current jobs represents a further cost to employers, insofar as new employees must be trained, at some cost to productivity.

The labour market has certainly changed in such ways in Baker Lake in response to Meadowbank. However it is noted in this regard that Meadowbank initially gave hiring preference to people in Baker Lake, as the most Project affected community, and hired substantially more people than originally envisaged (Cumberland, 2005). This contributed to a very tight labour market. Meadowbank has subsequently hired more people from other Kivalliq communities, but almost half of its employees still come from Baker Lake. AREVA's intent to hire more widely in Kivalliq should result in less pressure on wage rates and labour availability in any one community. However there will still be instances where employers will lose employees to the mining sector.

Thus, to the extent that the Project draws workers from other economic activity rather than from the pool of unemployed, there can be negative effects on service delivery and/or costs for both business and government. Labour force adjustments can also result in in migration. In migration can relieve labour shortages, however also increases demand for goods and services. In migration is expected in Baker Lake and Rankin Inlet (see Section 8.1.7 below). However it is

important to note that such labour force adjustments have an overall positive effect. As more skilled people move into new jobs, room is left for the less skilled to become employed and learn new skills. This process represents an increase in labour force capacity overall.

Finally, it is noted that whereas the positive effects of labour force adjustment are long lasting, the negative effects will arise in response to the rapid growth represented by the introduction of the Project into the Kivalliq economy. With time, labour force conditions will adjust, and then are expected to stabilize.

8.1.6 Incomes

AREVA acknowledges the challenges of rotational work, and the potential for competition for skilled labour, in part by paying competitive wages. Current estimates are that an average wage for unspecialized skilled workers during construction would be in the order of $60,000 in 2010 dollars and for a combination of unspecialized skilled (60%) and skilled (40%) workers in the early phases of operation the average wage would be in the order of $75,000. If we assume, conservatively, that 150 construction workers will have unspecialized skills (although some will surely be skilled), the Project's payment of wages to Kivalliq residents would be $9 million annually on average. If we assume that 60% of operations phase workers will have unspecialized skills, the Project's payment of wages to Kivalliq residents would be about $19 million annually.

We only have wage data for full time/full year work from 2006 (Statscan, 2007a). At that time, the median wage for full time/full year work was $50,000, which would be about $53,000 in 2010 on the basis of Nunavut's inflation rates since 2006. AREVA's expected wages for unspecialized skilled workers during construction is 19% higher than this median (which of course is calculated for all people working full year/full time including the highly skilled) and for workers during operations is 40% higher.

We have no means to calculate total wages paid in Kivalliq without making some very large assumptions. It is considered unlikely however that total wages paid to workers in Kivalliq in 2010 would have been more than $100 million given that in 2008 (that is, taking into account Meadowbank employment) there were 4,060 wage earners with median earnings of just under $22,000 in Kivalliq (GNBS, 2011e).[42] The construction and operations wages paid to Kivalliq workers would therefore represent increases in total wages paid of almost 10% and 20% respectively.

[42] This is a substantially lower figure that the median wage for full time/full year work because so many people in Kivalliq work at part time and/or seasonal jobs.

The above considers only direct employment by the Project. As noted in Section 8.1.5 above, an about equivalent number of jobs will also be created as a result of indirect and induced economic effects. It is not expected that all these jobs will pay wages comparable to those paid by AREVA, however there will be additional, substantial income effects from these jobs as well. Finally, as noted in Section 8.1.5, some pressure on wages is expected, also increasing incomes. As a conservative estimate, it is probable that new income attributable in some way to the Project would represent about 15% or more of current incomes during construction, and substantially more than that during operations. In this regard, it is noted that the median wage in Kivalliq between 2005 (without Meadowbank) and 2008 (with Meadowbank) increased by 25% as compared to increases of 14% and 5% in Qikiqtaaluk and Kitikmeot respectively, and the median wage in Baker Lake increased by 53%.

Increased incomes are generally associated, overall, with increased individual, family and community wellbeing. It is this association that motivates the emphasis given in consultations, by people and governments, to employment by the Project. The economic strategies of all levels of government in Nunavut are importantly based on the creation of formal sector economic opportunities, as one primary means towards enhancing wellbeing. There is, as the major benefit of the Project, potential for improved quality of life for those individuals (and their families) who are able to find employment with the Project, with businesses that supply the Project or elsewhere in the expanding economy. However it is acknowledged, both in this document and by the people of Kivalliq, that there are potential downsides to increased income, particularly at the level of certain individuals. These are addressed in Section 10, Assessment of Effects on Individual, Family and Community Wellbeing.

8.1.7 Population

Kivalliq's population has been growing quickly, however this has been associated almost exclusively with high birth rates – death rates have not decreased substantially over the last fifteen years and net migration has been negative (GNBS, 2010b). Although population growth rates are expected to slow somewhat over the coming years they will remain high, and higher in Kivalliq than in Nunavut as a whole.

The Project is not expected to substantially affect death or birth rates, both of which are foremostly a function of the age structure of the population. As Kivalliq's population ages, death rates can be expected to go up. Kivalliq's high birth rates are largely related to the fact that 35% of the population is under 15 and will become of child bearing age over the next 15 years. A change in either death or birth rates for other reasons could not be attributed to a single project. For example a desire for fewer children would represent a cultural shift that could not be attributed the Project alone. Improved health status as a result of government preventive and curative health services could slow the expected rise in death rates – this again would not be attributable to the Project.

Thus the primary potential linkage between the Project and population growth is through effects on migration. Potential migratory flows into Kivalliq are by:

- Project out of area workers moving into Kivalliq during construction and operations

- family members returning to Kivalliq from elsewhere in Nunavut, or Canada, in response to increased economic opportunity

- economic migrants, also drawn to Kivalliq in response to increased economic opportunity – these would also be from elsewhere in Nunavut and Canada

Further however, given the opportunities different points of hire represent and given expected rising demand for workers in particularly Baker Lake and Rankin Inlet, there is potential for both migratory movements within Kivalliq and net out migration.

It is not expected that Project out of area workers will migrate into Kivalliq. Construction jobs are temporary, all work will be rotational and transport between home communities and the work sites will be provided. It is possible that isolated individuals, for personal reasons, could choose to move into Kivalliq but numbers would not be large. Although operations jobs are longer term and there again may be exceptions, these workers are not expected to move in large numbers either.

There is more potential for in migration to occur as a result of members of Kivalliq resident families returning in the expectation of employment at home. The return of family members, particularly those who left to find employment elsewhere, can be of great benefit to both in migrating individuals and their families. It can be presumed that such people will return only if they are assured of employment, with the Project or in the expanding economy. Reuniting families and the addition of well employed members to families are benefits. Such in migrants can however have negative effects, in addition to positive ones. They may compete for and get jobs that would therefore not go to present residents, place additional demands on social services, and put pressure on local supplies of goods and services, particularly housing (see Section 11, Assessment of Effects on Public Infrastructure and Services).

Economic migrants could come from both elsewhere in Nunavut and elsewhere in Canada. Speculative in migration, migration without an offer of secure employment, will be constrained by housing shortages where individuals do not have the finances to pay market rates for private accommodation. It is thus considered unlikely that many people with no existing support systems in Kivalliq would migrate unless they were assured of employment. But there are likely to be offers of employment to people outside Kivalliq.

Business growth, now in response to Meadowbank and multiple exploration projects, has already generated searches by Kivalliq based businesses for employees from elsewhere in Nunavut and Canada. Smaller businesses in competitive markets are less likely to contract people on a rotational basis, but to expect them to move. Some of these in migrants will come with families. This migration is expected to concentrate in Baker Lake and Rankin Inlet where most businesses servicing the mining sector are located. However there is also some potential

for in migration into Arviat, where the comparatively large population and the preparedness of people for mining sector jobs may create some consumer business opportunities as well.

While mobility of the Inuit in Nunavut has been comparatively low by Canadian standards, engagement results indicate that there is some expectation that particularly the young will be more likely to migrate in the future, in search of employment. Many Nunavut communities are experiencing economic stresses and consequently comparatively high unemployment rates. Numbers of in migrants to Baker Lake and Rankin Inlet could become comparatively large.

There is also possibility of out migration from communities. Most references in the literature to mining, rotational work and migration in Canada's north are concerned with in migration of out of area workers, from the south. However there is some evidence of out migration. While people note that rotational jobs have an advantage in that it is not necessary for people to leave communities to be employed, there is some evidence that the reverse is also true – that people do not need to stay in home communities for work but have the option of moving to an alternative point of hire.

Storey and Hamilton (2003) report out migration in Alaska (Red Dog) and northern Saskatchewan (uranium mines). With two exceptions, populations in small communities affected by the diamond mines in NWT are declining or are stable, whereas Yellowknife is growing at twice the territorial average (NWTBS, 2011). Aboriginal communities in northern Ontario have seen mining workers move to Timmins. Agnico Eagle has observed some out migration from smaller communities into Rankin Inlet of some of its workers. People choose to move for many personal reasons, including the often better education, health care and employment opportunities for other family members that can be found in larger centres. People also say that they find moving to Baker Lake and Rankin Inlet easy, as populations are more diverse in these hamlets.

Population growth rates in Baker Lake and Rankin Inlet as of 2010 have been within normal ranges for Kivalliq communities so the implication is that to date numbers of migrants have been small relative to population sizes. However, the loss to particularly smaller Kivalliq communities of employed, well paid people and their families, even in small numbers, could be construed as a negative effect on the economic and social development of these communities. Family members left behind also lose the benefits of well paid, securely employed members.

There is also potential for migration not only between Kivalliq communities, but also out of Kivalliq to occur. The baseline data suggest that between 2001 and 2006 the Inuit population outside Inuit Nunangat increased three times as fast as did the population inside Nunavut. After big swings before and just after the NLCA, the pattern of net migration in Nunavut appears to have stabilized at between 100 and 200 out migrants per year for Nunavut as a whole (GNBS, 2011b). Points of hire in Iqaluit and southern Canada may offer employees an opportunity to move out of Kivalliq for the same kinds of personal reasons that would motivate people to move to Baker Lake or Rankin Inlet.

How all these migratory flows will net out, and when, is not possible to determine with any accuracy. Most migration decisions are not expected during the construction phase – construction jobs are most often temporary and therefore do not provide the economic security many people need to make life altering decisions. Population growth figures for Baker Lake may bear this out – a growth rate of 1.4% during peak construction of Meadowbank was in fact the lowest growth rate of the decade in Baker Lake, but growth accelerated in 2009 and 2010. With the settling in of the Project's operations however, for those people who find rotational work manageable and expect to be employed over the 14 year life of the Project, migration becomes more conceivable.

At a regional level, it is expected that what is likely currently net out migration could reverse – it is noted that current migration levels in Kivalliq are likely very small so even a limited number of in migrants has some potential to move migration to being net positive. This in turn could have an important effect on population growth. At current projected growth rates, Kivalliq's population could reach about 10,500 people by 2021. In a given year, 15 in migrants, with an average household size of four, would raise the regional population growth rate by almost 0.6% for example. An additional 15 families in response to a project the size of the Project is a very conservative scenario – actual figures could be much higher – however it is noted that the effect would not be expected to reoccur annually, but is likely to take place only over the early years of operations.

Effects at a community level could be more dramatic. As noted, normally it would be expected that most new comers to Kivalliq, and most migrants within Kivalliq, would settle in Baker Lake or Rankin Inlet. Potential for effects on population growth rates, currently over 2% in both these hamlets, would be greater than in the region as a whole, perhaps in the order of an additional 1% to 3% in each depending on where migrants chose to settle. A final consideration is that migrants within Kivalliq are expected to come from smaller communities. The departure of just two workers with families from Chesterfield Inlet or Whale Cove would represent a population decrease of about 2% on the basis of population projections for these hamlets to 2021.

Migration decisions are individual and reflect what people believe to be in their best interests under specific sets of individual circumstance. On the presumption that people are most often correct about making changes towards improving their lives, migration can overall be considered a benefit for those who migrate. The expected migration into Baker Lake and Rankin Inlet will be a further stimulus to economic growth and has some potential to relieve any developing labour shortages and consequent pressure on wages. Population growth does however increase demand for public infrastructure and services, demand that will need to be planned for if delivery of services is not to suffer (see Section 11, Assessment of Effects on Public Infrastructure and Services). The effects on small communities that may lose workers to Baker Lake and Rankin Inlet are the reverse.

8.1.8 Closure

Final closure is inherent in the non-renewable resource extraction industry. GNDoF (2010) notes the importance of encouraging the development of multiple mining projects in order to stabilize Nunavut's economy in face of the inevitable closures of future mining projects. The economic instability that the expenditure patterns of large mining projects can bring to Nunavut's small economy has been demonstrated in the recent past by large swings in economic indicators in response to Meadowbank (see Technical Appendix 9A, Socio-Economic Baseline). The closing of the Project can be expected to have equally large, and larger, effects to the extent that other opportunities do not open up as the Project comes to its final closure. What evolves in the mining sector is Nunavut will determine whether the result is unemployment and economic contraction, with consequent social effects, or whether new mines are taking the Project's place.

Final closure is scheduled to begin in 2035, barring discovery of additional reserves and an extended Project life to 2046. Final closure activities have been estimated to cost about $160 million, however as some of this will be spent during the last years of operations on progressive reclamation, average expenditures of the four year closure phase would be about $34 million per year, only a proportion of which would be spent in Kivalliq. Final closure will employ an average of perhaps 70 people, on a seasonal basis only. Final closure thus represents a reduction, over the operations phase, in expenditures in the order of 50% or more and in employment of over 90%, with consequent reductions in all associated economic effects.

Post closure will involve, initially, at least 10 years of primarily environmental monitoring activity to ensure that final closure has achieved its environmental objectives. Expenditures will shrink further, to about $6 million per year on average, and seasonal employment to about 15 people. As most negative effects will be experienced over final closure, post closure is not expected to have important additional effects, except on a very few individuals.

As noted in Section 6, Socio-Economic Management, AREVA will remain mindful of the potential for negative effects throughout the Project life cycle, integrating sustainable development principles into socio-economic management measures in an effort to minimize to the extent possible the negative socio-economic effects of closure. Enhanced capacity of the labour force and businesses, other contributions to wellbeing, and increased government and NTI/KIA revenues are expected to position people to achieve improved socio-economic status over the life of the Project. This should have the result of improved capacity to absorb the effects of closure even in the absence of replacement economic activity.

Premature closure has more potential for negative effect, insofar as this is largely unforeseen and unplanned. Project viability depends most importantly on the price of uranium. Should this price drop significantly over the life of the Project, temporary or final closure could occur prematurely. It is argued throughout this assessment that although the construction and the initiation of operations have potential to create various negative socio-economic effects, with time as community economies and people adapt to change, positive effects will continue to gain

momentum while negative effects will moderate or at least stabilize. However such adaptation potentially involves people making some life altering decisions, including leaving current employment, migrating and taking on financial obligations made possible by secure income. Premature closure has potential to have very negative effects in such a context.

The economic context in 2035, 2046 or, in the case of premature closure, at some time between 2017 and 2035 cannot be predicted at this time. Actual closure effects will depend on that context. As many construction workers are always moving from job to job, with steady employment dependent on vitality in the construction sector, so mining employees can move from project to project in a mining economy – as individual projects close others and others open. To the extent that Nunavut's economy sees more sustained activity in the mining sector – and the signs are positive that there is potential for this – negative closure effects from the Project would be replaced by positive effects from other projects.

8.1.9 Residual Effects

Residual effects on community economies are mutually reinforcing, and although there is some potential for negative effects on some individuals, overall the reinforcement is towards benefit – direct employment, work force and public education and training programs and contracting by the Project will all contribute to economic growth and diversification through the indirect and induced effects that create yet more employment, labour force capacity and business development. Project extension beyond the currently planned 14 year operational phase to a 25 year operational phase would imply yet more benefits to community economies.

Such economic growth has some potential for what are expected to be largely temporary negative effects as people and economies adjust to what will be a large economic shock. In contrast, the positive effects are expected to gain momentum as capacity of Kivalliq people to participate in the Project, and in other mining projects across Nunavut, increases. There will also be challenges for hamlet and territorial governments associated with higher, largely unpredictable in size, population growth rates than are currently projected in Baker Inlet and Rankin Inlet.

Table 8.1-7 summarizes what are expected to be Project effects on community economies, and includes assignments of attributes. Employment, contracting and education and training effects are positive and significant in all Kivalliq communities, as is the capacity building that is associated with both training and job and contracting experience, a long term benefit. Quantified magnitudes in the table are based on expectations that are somewhat uncertain, however there is high confidence in the prediction that the effects will be significant. For example, decreases in unemployment rates are expected to be in full percentage points (3% to 5% at the regional level for 2017 and 2021 respectively) – normally decreases of a fraction of a percent in unemployment rates are considered important indications of economic progress.

Economic growth and diversification have some potential for negative effects in the short to medium term, but overall are positive and significant benefits. The benefits are expected

primarily in Baker Lake and Rankin Inlet, and secondarily in Arviat. The indirect and induced effects are expected to cluster in hamlets with the competitive advantages of geography, larger populations, and previous experience with Meadowbank and exploration companies. Expected in migration into Baker Lake and Rankin Inlet will also contribute to economic growth and diversification. As for employment, contracting and education and training benefits, prediction confidence in the significance of economic growth and diversification is high.

Income effects are also considered positive and significant, with a high level of confidence in the prediction.

Migratory flows are complex, and are likely to result in both positive and negative effects, both within and between communities. Some combination of in migration into Baker Lake and Rankin Inlet of people from outside Kivalliq and from other Kivalliq communities is expected in the early years of operations, likely in numbers high enough to keep population growth rates in these two hamlets higher than currently expected. Some out migration from smaller communities is also expected, which for the smallest communities could make a significant difference to population growth rates. Insofar as migration is in response to offers of secure employment and migrants make the choice to move in order to meet personal goals for themselves and their families, they are expected to benefit.

The potential for final closure to have negative effect will depend on the economic options available at the time of closure – the development of the mining sector, with its cyclical characteristics, would help to ensure that alternatives are available. Whereas premature closure effects also notionally could be moderated in the event of alternative employment being available, its unforeseen and unplanned natures creates potential for highly significant negative effects at both the individual and community levels.

Table 8.1-7Summary Impact Matrix, Effects on Community Economies

Effect	Project Phase	Mitigation/ Enhancement	Direction	Magnitude	Geographic Extent	Duration	Significance	Likelihood	Significance Prediction Confidence	Monitoring
Residual Project Effects, Community Economies										
Increased employment	Construction	Preferential employment, education and training, workforce management	Positive	Average of 150 jobs, 3.5% lower unemployment rate in 2017	Communities	Medium	Yes	High	High	Operations monitoring
	Operations			Average of 250 jobs, 5.8% lower unemployment rate in 2021		Long				
Contracting opportunities	Construction	Preferential contracting	Positive	Average of $60 million annually	Primarily Baker Lake, Rankin Inlet	Medium	Yes	High	High	Operations monitoring
	Operations	Preferential contracting	Positive	Average of $30 million annually		Long				
Work force and business skills training	Construction	Project related education and training programs	Positive	High	Communities	Medium	Yes	High	High	Operations monitoring
	Operations			High		Long				
Broader education and training	Construction and operations	Education initiatives	Positive	Medium	Communities	Long	Yes	High	High	Operations, collaborative monitoring

Labour and business capacity building	Construction and operations	Preferential employment, education and training, preferential contracting	Positive	High	Communities	Long	Yes	High	High	Collaborative monitoring
Economic growth and diversification	Construction	Preferential employment and contracting education and training	Positive	High	Primarily Baker Lake, Rankin Inlet and to a lesser extent Arviat	Medium	Yes	High	High	Collaborative monitoring
	Operations					Long				
Labour market pressure effects on employers	Construction	None practical	Negative	Medium	Primarily Baker Lake, Rankin Inlet	Medium	Yes	High	High	
	Operations			Low with time		Long	No	Medium	Medium	
Labour market pressure effects on employees	Construction	None required	Positive	Medium	Primarily individuals in Baker Lake, Rankin Inlet	Medium	Yes	Medium	Medium	
	Operations			Medium		Long	Yes	Medium	Medium	
Inflation	Construction	None practical	Negative	Low	Primarily individuals in Baker Lake, Rankin Inlet	Medium	Yes	Medium	Medium	
	Operations			Negligible with time		Long	No	Medium	Medium	
Increased incomes	Construction and operations	Fair wages	Positive	High	Individuals	Long	Yes	High	High	Operations monitoring for Project workers, collaborative monitoring
In migration of out of area	Construction and	Workforce	Negative	Negligible	Primarily Baker lake,	Long	No	Medium	Medium	Operations monitoring for

Project workers	operations	management			Rankin Inlet					
In migration into Kivalliq of other workers	Construction	None practical	Positive	Low	Primarily Baker lake, Rankin Inlet	Long	No	Medium	Medium	Project workers, collaborative monitoring
	Operations		Positive	Medium		Long	Yes	Medium	Medium	
In migration within Kivalliq of workers	Construction	None practical	Positive	Low	Baker Lake, Rankin Inlet	Long	Yes	Medium	Medium	
	Operations			Medium		Long				
Out migration within Kivalliq of workers	Construction	None practical	Negative	Low	Primarily Chesterfield Inlet, Whale Cove	Long	Yes	Medium	Low	
	Operations			Medium		Long				
Premature closure effects	Operations	Closure planning	Negative	High	Communities	Medium/long	Yes	High	High	Collaborative monitoring
Final closure and post closure effects	Final closure	Closure planning	Negative	Low/high	Communities	Medium	Yes	Medium	Medium	

The emphasis in this section has been on effects on Inuit. As the socio-economic baseline in Technical Appendix 9A makes clear, non-Inuit employment is not of concern in Nunavut. The non-Inuit are essentially fully employed, and where non Inuit are not working, they generally have the educational and work experience qualifications to find employment should they decide to enter the labour force. Non-Inuit would experiences negative effects and benefits on community economies as Inuit would, but again in most cases have the resources to better manage any negative effects.

8.2 CUMULATIVE EFFECTS ANALYSIS FOR COMMUNITY ECONOMIES

Section 13.2, Cumulative Effects Analysis for the Economy of Nunavut, constructs a scenario, at the territorial level, that considers the potential for construction and then operations of nine large mining projects over the period to 2030. The scenario is based on publicly available information at mid-2011, on project development plans of Meadowbank, Doris North phases 1 and 2, Meliadine, Mary River, Hackett River, Back River and Izok Lake, as well as the Project – these projects are therefore considered reasonably foreseeable. The important conclusion, relevant to expectations regarding cumulative economic effects in Kivalliq and its communities, is that ongoing, sequential development of mining projects can be expected to even out the economic shocks that individual projects can have.

It will be noted that most of the above listed projects are in Kitikmeot Region. This may be less relevant to supply and demand for Kivalliq based workers, goods and services than may be first apparent. To date, Nunavut expenditures of Meadowbank and the Project (and by presumption, Meliadine) have been over 95% in Kivalliq. The rapid growth of capacity to supply the mining sector is expected to continue, on the basis of high levels of exploration activity, ongoing experience with Meadowbank and early development of Meliadine. Kivalliq may in fact be well into developing a competitive advantage that may see, in face of imperatives to maximize project expenditures in Nunavut, more than proportional participation in mining projects in other regions.

Cumulative economic benefits of Meadowbank, the Project and Meliadine are essentially additive – each will add more jobs, contracting, education and training, economic growth and diversification and incomes to a growing total. This will happen in an environment of lack of economic opportunity. Any spillover effects from projects in other regions would add yet more economic benefits.

However cumulative economic benefits of all reasonably foreseeable projects are potentially less than totaling up the benefits of each individual project. The analyses in previous sections indicate that there is capacity in Kivalliq to meet supply requirements of the Project. Meliadine's effects, on the presumption that the construction and operation of that project had effects approximately parallel to effects seen at

Meadowbank, should also be fairly easily accommodated, given expected labour force growth, improving educational achievement and increasing business capacity to supply. In principle, potential benefits from spillover effects would be yet additional.

Depending on additional demand from outside Kivalliq, including for supply of goods and services which also imply increased demand for labour, it is conceivable that the potential for benefit would be less than additive, that is, a threshold could be crossed to a loss of opportunity because of an inability to supply all the labour and goods and services on demand. Demand could conceivably rise to a level where projects find it necessary to import from elsewhere labour, goods and services that notionally should be supplied from Kivalliq, simply because populations in communities are not large enough to meet all that demand.

In addition to reasonably foreseeable projects, AREVA expects that the development of the Project could motivate three additional uranium mines in western Kivalliq and one additional uranium mill; that the project life of Meadowbank will be extended on the basis of new finds; and that one gold mining project (additional to Meliadine) will be developed. This is the far future scenario presented in Section 3, Assessment Approach.

Such developments would of course imply yet additional demand for Kivalliq labour, goods and services, and again, all these are notionally benefits. As these far future developments, to date basically not identified as to time or place, are considered far future, actual effects are unknown. The balance between benefits and inability to realize benefits will be a function of a well-planned and well positioned supply response. This in turn will be a function of experience with mining projects on the parts of both labour and business, and increases in educational achievement of Kivalliq's population.

Cumulative economic benefits are significant. Irrespective of how many of the reasonably foreseeable projects become operational over the coming years, each is large enough to ensure that benefits will ensue. The more interesting issue however is the extent to which benefits can be maximized, as opposed to some potential benefits being foregone because of more demand than capacity to supply.

It is arguable that such cumulative effects are not the responsibility of AREVA to mitigate or monitor. Additive effects are in any case simply the effects of additional projects on baselines at the time these projects move forward with their respective EISs, and would be expected to be addressed in those EISs. Managing the economic response to a large number of new projects is a fundamental responsibility of government.

This is not to say that AREVA has no role – capacity enhancement of labour and business and cooperation with other mining companies to share information and best practice contribute to government's management of the mining sector. As noted in Section 13, Assessment of Effects on the Economy of Nunavut, the preparation of the

labour force, perhaps initially focusing on technical and short term training, in the longer run should be targeting postsecondary degrees and diploma courses in mining related fields.

8.3 SUMMARY OF EFFECTS ON COMMUNITY ECONOMIES

Economic effects on communities are expected to be benefits overall, very important benefits insofar as there are not enough economic opportunities for those who wish to take on wage employment and insofar as the numbers of people who would make that choice are expected to grow rapidly for the foreseeable future. This is not to minimize the potential for negative effect, particularly initially before some stability is achieved in work forces, capacity to supply and community populations.

If climate change facilitates resource extraction in Kivalliq, through reduced costs, the types of benefits discussed above would increase to the extent that Kivalliq has the capacity to access those benefits. Depending on the speed of any growth in extractive industry, the primary danger lies in either leakage of economic effects outside Kivalliq as workers and suppliers have to be sourced from elsewhere in Canada, or at the limit increased in migration of southern workers into Kivalliq.

No transboundary effects are foreseen. It is conceivable that growth in the uranium sector in The Project could increase demand for experienced uranium miners from northern Saskatchewan. These workers would almost certainly be rotational workers.

9 ASSESSMENT OF EFFECTS ON TRADITIONAL CULTURE

Effects on traditional culture will largely be driven by opportunities the Project will create for participation of people in the wage based component of the economy rather than by any significant effects on the land and its resources. Rotational work offers not only the income needed to fund activity on the land, but also lengths of time off that permit extended travel on the land. However, there are concerns about retention of traditional cultural associated with extended periods of time spent in a cross cultural context and the expansion of the wage based component of the economy.

As noted in Section 6, Socio-Economic Management, AREVA will put in place work force management policies and procedures to facilitate people's needs to the extent practical for leave in order to engage in traditional activity and to validate traditional culture in the work place. The Project will however be a contributing factor to economic and social change that is in any case ongoing and thus will be a contributing factor to changes in traditional culture.

9.1 RESIDUAL PROJECT EFFECTS ASSESSMENT ON

9.1.1 Analytical Methods

For purposes of this EIS, Project effects on traditional culture are considered in terms of selected component parts – harvesting (primarily of caribou, marine mammals and fish), associated food security, language, values and knowledge, and sites of heritage value. This is of course an artificial breakdown as traditional culture is in fact an integrated whole made up of these, and other, component parts.

The analysis is necessarily qualitative, and is heavily dependent on results of engagement and socio-economic and IQ data collection, as well as on reference to academic and other literature.

9.1.2 Harvesting

The centrality of harvesting to traditional culture is not debated. It is clear from what people say that even where harvesting activity may be constrained in the present for some reason, the availability of resources for future harvesting, including later generations, is a deeply held value. Harvesting also is a means by which traditional

skills, values and knowledge are shared, and confirms social (including gender and intergenerational) roles and relationships. Harvesting provides food as well as materials for clothing[43] and arts and crafts, including carving stone. Harvesting is thus fundamental to the preservation of Inuit identity and culture.

The Project is not expected to negatively affect harvesting through limiting the numbers or availability of resources. The Project footprint does not intersect with known carving stone resources. The environmental assessments on terrestrial, marine and aquatic animals indicate no significant environmental effects on harvested resources, although there is necessarily some level of uncertainty. Loss of habitat is minimal. Traffic related accidents are expected to be infrequent and even should an accident result in animal mortality, it could only affect one or very few individuals. A major spill could affect more animals, but such spills should be rapidly contained in a comparably small area.[44] Significant effects on changes in abundance are therefore not expected from environmental effects.

There is more uncertainty about animal distribution patterns and migration routes in response to some environmental effects, such as noise and other disturbances at the mine site and docking facilities, and from both truck and marine traffic. These are related primarily to land and marine mammals, rather than fish.

Although elders identified Judge Sissons Lake, south of the mine site, as a migration route for caribou in the past, they noted that the area was not frequently used for hunting, and was only irregularly used for fishing. Technical Appendix 3B, IQ Documentation notes that there has been little past use of the area based on interviews with Inuit and on historical references, and NWMB (2004) concluded that the area west of the Thelon River had been subject to little harvest pressure, due to low animal densities as well as it being difficult to access to the area. However caribou crossings were also identified to the north west of Baker Lake, crossings potentially affected by the all-weather road.

The relationship between marine transport and marine mammals has been of concern in coastal Kivalliq communities for a long time (see historical references cited in Technical Appendix 3B), particularly with reference to distribution and migration patterns. This is

[43] This also has a gender dimension insofar as women are less likely to hunt themselves (although some do) but need harvested materials to sew for their families or and/or for sale and income.

[44] Traffic management measures should reduce the likelihood of accidents include speed controls and other safe operating procedures for both land and sea transport vehicles. Emergency response preparedness is expected to mitigate the potential for negative environmental effects of, for example, spills. Marine transport monitors will assist transport workers to avoid collisions with animals.There is however always the possibility of a catastrophic event.

general, but is heightened in the channel between Chesterfield Inlet and Baker Lake, important habitat for seals and whales (NPC, 2011). In Chesterfield Inlet, beluga whales are described as both abundant and the most culturally important marine species and people feel that the increase in traffic (noise and vibration) as a result of Meadowbank has had a negative effect on these whales.

The assessment of effects on marine mammals notes that although significant effects are not expected, there could be movement away from ships and/or barges, which could in turn mean that animals might move away from suitable habitat, change behaviours and/or experience 'energetic stress'. Distribution and migration patterns could change as a result.

Fishing concerns related to harvesting focus on Baker Lake and Chesterfield Inlet rather than lakes in the mine site area, which does not overlap with any known fishing spot preferences. (There are however more general environmental protection concerns about fish at the mine site becoming contaminated.) Baseline results on fish indicate that spawning occurs outside Baker Lake, but people say that Arctic char migrate into Chesterfield Inlet to spawn. As for marine mammals, fish could have a behavioural response to noise, but no significant effects are expected – people will be able to fish as they always have.

Results from consultations and socio-economic and IQ data collection suggest that with regard to land mammals, migratory patterns are in any case changeable and unpredictable (see Box 9.1-1). As the animals move, so do hunters as they share information on successful hunts. There is some feeling that caribou avoid hamlets because of noise and traffic, although in Baker Lake people feel that caribou may be attracted to the hamlet as they are often seen drinking at the landfill. Nor does unpredictability appear to affect levels of harvesting activity, insofar as it is understood to be normal. As the baseline notes, harvest levels continue to remain high although unpredictability may explain part of the high year to year variability in catches as reported in NWMB's harvest study (2004).

Box 9.2-1 Animal Distribution and Movement

Caribou naturally change their migration patterns every few years.

Caribou herds don't take the same routes anymore.

Caribou no longer go to Rankin Inlet because there are too many people there, and there are too many people with snow machines on the south side of Chesterfield Inlet – this had made it difficult to determine the natural movement of caribou.

There are not a lot of caribou around the hamlet now, they don't like all the noise from the snow machines and all-terrain vehicles.

Wildlife moves so it is important to protect the environment everywhere, not just at specific places.

Predicting where animals are is important because they migrate and fuel is expensive.

Muskoxen are not close anymore so they are not hunted often.

Beluga whales used to come into the harbour at Chesterfield in August, but come only occasionally now as there is too much noise from boat motors.

Because of the increase of barge traffic in Chesterfield Inlet there are fewer seals in the inlet.

There were no seals last year and this is because of Meadowbank's traffic. Traffic vibrations drive seals away.

As Box 9.1-1 indicates however, there is more concern about marine mammals, particularly in Chesterfield Inlet where people feel increased barge traffic has in fact changed distribution. This implies increases costs in both time and money to hunt successfully, and in the case of whales, possible loss of access. No access issues are expected as a result of changes to sea ice conditions attributable to the Project.

An additional factor, frequently spoken of, is related to the potential for contamination of harvest resources – land and marine mammals and fish. The understanding that any uranium contamination may not be observable in harvested resources has suggested to some people that harvesting is less attractive as a source of food.

Reference was made above to difficult access being a constraint on harvesting west of the Thelon. The winter road is not expected to result in an upsurge of hunting for the months that it operates. However, the all-weather access road could potentially increase hunting pressure. Baker Lake hunters indicated support for infrastructure crossing the Thelon River in order to access the area if caribou were there. Technical Appendix 3B

cites a study on Inuit lifetime hunting patterns, noting that younger hunters travel longer distances than older ones.[45]

However, at the same time, hunters in Baker Lake but also in most other Kivalliq communities also indicated that they do not go as far as they used to go but most often hunt close to their communities. In Baker Lake for example, hunters said that they didn't often need to travel further than about 40 km from the hamlet and most frequently hunted within 10 km because there are caribou close by.

From the point of view of traditional culture, increased access to harvested resources (caribou specifically, but potentially other land mammals) would be considered a benefit. It increases the options for following animals whose movements change regularly. The ease of travel, and safety, on the Meadowbank road has encouraged more hunting along this route. But the Meadowbank road does not appear to have been an important cause of any changes to total harvests. Statistics Canada (2007b) reported rising harvest activity for all but two Kivalliq communities between 2001 and 2006 (that is, the number of people harvesting trended slightly upwards over this period at least everywhere except Chesterfield Inlet and Whale Cove). AREVA's investigation of harvesting in Baker Lake indicated some small increase between 2000 and 2010 as well, with the indication that this was associated with fewer constraints to harvesting, the major constraints being time and money.

What the above implies however is that there is a confounding factor in the case of the Project's all-weather road. Wildlife managers are concerned about the viability of the Beverly caribou herd, with its breeding grounds in northwestern Kivalliq.[46] Any increased pressure on this herd could have a negative effect on the sustainability of hunting of the herd. It is noted in this regard that both the wildlife boards and HTOs share responsibility for ensuring the sustainability of harvesting levels and although problematical in some respects, a prohibition on hunting of the Beverly herd would be an effective means of addressing concerns about over hunting of these caribou. AREVA fully expects to cooperate with any joint decisions made by wildlife boards and HTOs with regard to controlling hunting of, or access to, the Beverly herd. The all-weather access road would not be constructed, if it will be constructed at all, before 2022. This leaves many years for decision making in this regard.

Aside from effects on harvested resources, the other major potential link between a large Project and harvesting is through the movement of large numbers of people into the

[45] This however was thought to be related to increasingly available snow machines.

[46] This continues despite recent press reports that the Beverly herd may in fact have just moved.

wage based component of the economy and as a corollary out of the land based economy. As the socio-economic baseline notes, most people in Kivalliq express a preference to continue to be active in both wage and land based economic activity. Rotational work provides both the resources to go out on the land, and extended periods of time to do so. With regard to the latter point, a rotation of two weeks on and two weeks off provides non working weeks every month, and up to six weeks off when vacation leave is combined with off rotation periods.

Lessons from NWT suggest that traditional harvesting increased, rather than decreased as predicted, with more wage employment in the diamond mines taken up by people in smaller communities. Nor is there any evidence that there has been less harvesting in association with Meadowbank. As noted above, AREVA's investigations in 2010 indicate that harvesting is stable and may be on the increase, particularly among the more employed. With a single exception, every household interviewed reported harvesting activity in 2010. While it is true that more people report themselves as occasional harvesters only, people seem to catch as much as they did at the end of the 1990s and clearly have a preference for hunting from home or nearby cabins – family, health, employment, and costs are all considerations. Cabins are most often found close to communities, where they can be easily accessed along an established travel path.

Box 9.2-2 Harvesting and Employment

Being able to buy boats, cars and snow machines allows people to hunt and fish more than before.

I can go on the land and hunt more than before I had a job – I can afford to go hunting and rotational work gives me the time.

A schedule of two weeks working and two weeks off is good – two weeks off allows time to travel and hunt, and gives a lot of time with families and especially with children.

People are taking their kids out of school to go on the land during their weeks off.

9.1.3 Food Security

Food security refers to adequate safe, nutritious, culturally acceptable food, accessible to all in a dignified and affordable manner (Koc and MaCrae, 2001). Socio-economic and environmental factors have influenced food security in Nunavut and in Kivalliq. Settlement in hamlets, wage employment, rising costs of travel on the land, and real or perceived contaminants have brought about changes in food consumption patterns over the last decades. Traditional diets have been displaced by mixed diets which include some store bought foods with lower food value, it is thought to the detriment of health and to household resilience in face of economic challenges.

In the absence of harvesting, the ability of households to satisfy all the above criteria for food security is challenged by poverty in face of high food costs, particularly for fresh foods. While the previous section noted the cultural importance of harvesting as integral to Inuit identity and culture, harvesting also serves as a means to ensure good quality food not only for harvesters and their families, but also the people they share with. Section 4.3 notes that the value assigned to harvesting is much more likely to be articulated as a basic need value (food and secondarily clothing) than as a cultural value. This is also supported by socio-economic baseline data collection results (see Box 9.3-1).

Box 9.3-1 Country Food

Young people increasingly depend on older people for their country food, because the young cannot afford to go out and hunt.

Store bought food is too expensive.

Variety is important partly because people like to have different food and also because people are not supposed to over-hunt.

This is not tradition, harvesting is for food.

People hunt for food and fish for food. No one says hunting and fishing are recreational activities.

Most people in Baker Lake still depend on caribou for food.

Results presented in the socio-economic baseline of both estimations of the market value of harvests in Kivalliq communities, and levels of harvesting of a variety of country foods in Baker Lake suggest high dependence on hunting and fishing for food. The baseline also notes that two thirds of households, and half of children in Nunavut, were found to be food insecure at some time in 2007/2008 in Nunavut – it is considered unlikely that food insecurity is not an important challenge in Kivalliq in 2011. Changes in harvesting thus would have important implications for food security, but as the previous section notes, it is not expected that harvesting levels will decrease overall as a result of the Project.

However, there are other linkages to consider. There are concerns that wage employment will undermine the value of sharing, a mechanism that has historically served to ensure that not only harvesters, but also the less fortunate members of Inuit society, have access to food. This could arise from either or both of a shift in values as a result of cross cultural contact (such as an increase in individualism) or increased commercialization of harvesting in response to people's ability to pay.

AREVA's investigations in Baker Lake indicated that sharing remains high in the hamlet. But there is also unmet demand for country food – just over a third of people said they are eating less country food than they would like – and there is a willingness to pay for country food. In a context where income inequalities develop between those with well-paying jobs and those without, commercialization of country food seems to be occurring to some small degree.

One upside is some potential for some people to fund capital and operating costs of harvesting in the expectation of some financial return. However such a process is likely to have negative effects on those who depend in some part on sharing for food security. A second upside is more diversity in traditional diets. There is some evidence that people in Baker Lake are eating more foods from marine mammals than they had in the past for example. Variety in country food availability has some potential to replace some store bought food.

It is also noted that even the employed can struggle to keep up with the cost of living so there will still be motivation to harvest in order to conserve cash for other needs. People mention that with employment, rents for housing go up rapidly and family members have expectations of support. Increasing government initiatives to encourage traditional activity on the land and educate on its health benefits also motivate continuing to harvest. And people continue to want more country food.

9.1.4 Language

Issues of language and cultural preservation are central to economic and social development strategies in Nunavut – for example, debates on an appropriate education policy for Nunavut reflect a fundamental concern that the young acquire skills needed to work in the wage based component of the economy, but also retain Inuktitut. People in communities also worry that Inuktitut may be lost over the longer term, as the young are more immersed in English environments (see Box 9.4-1). People are worried about maintaining Inuktitut as a primary language or worse, that there will be a loss of bilingualism in favour of English. Loss of language is loss of identify, and makes the communication between generations, including the passing on of IQ, difficult.

Box 9.4-1 Language

People want to stay in the community, and people who leave try to come back because they feel their kids are losing their language.

Baker Lake and Rankin Inlet, where there are more white people, use Inuktitut less but people in other communities have stronger Inuktitut.

I was studying outside Nunavut but it seemed I was losing my language so I came back home for a while

Cultural differences at Meadowbank cause problems – people should try to translate if others are listening.

I speak to my own children in Inuktitut but see younger people and children not learning Inuktitut at all and believe this to be wrong.

Parents consider it very important for children to speak Inuktitut because if not, they will not understand the elders.

Young people, even young adults, are now speaking a mix of Inuktitut and English.

There are fundamental questions about the extent to which southern Canadians are coming to exert economic influence in the north. In a cross cultural context, language can be viewed as a resource, used to extend power of one group over another – if one language has to be used in preference to another it gains status (Dorais, 1989). This is the real concern related to the retention and use of Inuktitut. Allen (2007) notes that particularly where people learn two languages from birth, but live much of their lives in an English environment, there can be a trajectory to higher proficiency in English.

English has taken hold in Kivalliq in two important domains, school and work. The non Inuit population represents less than 10% of Kivalliq's population. But the use of English is proportionately much more dominant than that. The use of Inuktitut at home and the teaching of Inuktitut to children before they enter the school system are still common in Kivalliq communities and this does help to forestall erosion of language, however success in high school and in most of the wage based component of the economy requires English. There are large differences between communities – in more traditional communities, over 80% of Inuit speak Inuktitut at home, while only about half or less do in Baker Lake and Rankin Inlet.

It is noted that these percentages are from the 2006 census, and therefore pre date any employment at Meadowbank – there have many drivers of language use operating that have no association with mining, including the English curriculum in high schools, entrance of English media (primarily the internet, television and music) and struggles to staff social service delivery with Inuktitut speakers. Nunavut passed the Inuit Language Protection Act in 2009 to address some of these issues, and there are a number of initiatives underway to implement the act. To the extent that people in Kivalliq are aware of the potential for language loss and have convictions about the need to retain Inuktitut, measures to advance the use of Inuktitut can be expected to have some success (Allen, 2007 and Tullock, 2004).

As noted in Section 6, Socio-Economic Management, the Project will facilitate the use of Inuktitut in the work place to the extent practicable, however English will be the work language for most Inuit employees and proficiency in English will be required on work place health and safety grounds. The Project will thus contribute to the expansion of the use of English. Countervailing measures, by government and people, should result in strengthening bilingualism rather than loss of Inuktitut however.

9.1.5 Values and Knowledge

IQ encompasses a value system that rests on sharing, cooperation, group decision making and healing and counseling, resourcefulness and both knowledge and conservation of the land and its resources. IQ confirms the identity of people, and is critical to individual, family and community wellbeing (James and Irniq, 2008). Skills in applying IQ to livelihoods are the means by which values and knowledge are practiced, and therefore maintained. Participation in the land based component of the economy provides economic inclusion but it also provides social inclusion.

Changing values and knowledge (cultural change) has a great deal to do with changing patterns of subsistence, a process that has been going on for decades. IQ values reflect that people's relationships are defined by the reciprocity and exchange that ensure the wellbeing of the group, whether this involves an elder providing guidance and emotional support or a hunter sharing harvest (Myers and Powell, 2004). It is not clear to people that, as Kivalliq's economy becomes more wage based, IQ values will remain as strong as they have been in the past.[47] Box 9.5-1 gives some evidence that people continue to see IQ has critical to wellbeing, but at the same time are not quite sure how possible it is to function in a mixed economy without some loss of traditional culture.

Box 9.5-1 Values and Knowledge

When traditional activity reduces, so does knowledge.

It still is extremely important to people to keep a grip on tradition, and memory, which roots people and gives them identity.

Traditional activity can only be learned by working at it, not by playing at it.

We are not going back – that is not the intention of teaching traditions.

The south is moving in too fast.

If young people give up hunting to work in the mine, they will not be self-sufficient if it closes.

[47] Although Myers and Powell also note that values do persist – they observed sharing practices extending to store bought foods.

The young are no longer self-sufficient so they do not have that to be proud of.

It is hard to live both a traditional and more modern life. It is particularly hard for people to understand how to resolve problems in ways that combine the two very different lives.

There is some resentment that people feel they need a paycheck to live reasonably, that is, that the traditional economy has given way to a more modern economy that requires quite a bit of money to participate in.

Wood for making drums comes from the lumber store. Hides are not used for drum skins because they dry out – even elders use store bought drum skins now.

Elders used to run communities and told young people where to hunt. Now, their governance role is gone and their role as hunting advisors is diminished.

Hunting skills are not being passed down in the younger generation, mostly because there is not enough time.

The traditional Inuit value of sharing is disappearing.

Not hunting on Sundays is IQ.

Socio-economic data collection results suggest people's concern that with increasing wage employment, workers will, over time, abandon the values particularly of sharing and make their decisions based on their own needs and desires, and those of their immediate families, rather than on the needs of the group. Some people worry that this increases vulnerability, and that the authority and wisdom of elders is giving way to the wage earner as the role model and advisor.

Values and knowledge cannot be maintained unless they are practiced. For example, the act of sharing food is considered to reproduce values of cooperation and equity (Kishigami, 2004). Thus there is a central role for harvesting as the primary means by which values and knowledge are practiced. It is expected that the Project will provide the income and time to continue land based activity. There perhaps is more concern that despite this, cultural change associated with more opportunities to transition into the wage based component of the economy will, over the longer term, demotivate traditional activity on the land and see values moving towards a more individualistic rather than group ethic. Although the socio-economic baseline concludes that high employment in Baker Lake in 2010 has not yet had an observable effect on values and knowledge, and their practice, this does not eliminate the potential for this kind of cultural change as a result in part of increasing wage employment in the future.

Cultural change has been ongoing for some time, and will continue irrespective of the Project. The Project will certainly be one driver of change, but how people respond will often be a choice. Widening economic opportunities, both with the Project and in the rest of the economy, are highly desired by many people, in the recognition that change is needed if wellbeing goals are to be achieved. It is arguable that not only employment, but unemployment and its consequent challenges are also a detriment to maintenance of traditional values and knowledge.

Wage employment, with all it may imply for some, is one avenue but not the only avenue for livelihood strategies and associated values and knowledge. As discussed above for language, validation and support for traditional culture on the part of the Project and government, as well as ongoing importance given to Inuit values and knowledge by people, should help people make the choices they want to make. It may be that there will be strengthening of people's abilities to successfully combine wage based and land based economy activity in the various ways they find most suitable. To the extent that some choose to maintain more traditional lifestyles, and are able to do this successfully, is the extent to which cultural change can be managed in ways that people themselves find appropriate to their needs.

9.1.6 Cultural Heritage Sites

Technical Appendix 9B, Archaeology Baseline and Technical Appendix 3B, IQ Documentation, include maps of cultural heritage sites identified in interviews with elders.

Technical Appendix 9B indicates that Dene groups lived in and travelled through parts of what is now Kivalliq until contact with Europeans, but then moved south into the forests where they hunted. At this time, Inuit moved in. Thus it is Inuit cultural sites that are primarily found, largely on the margins of the major rivers and lakes in the Kazan, Dubawnt and lower Thelon watersheds. Archaeology sites are mostly camps, characterized by stone features including inuksuit, tent rings, caches, hunting blinds and kayak stands. With settlement in communities, year round occupation of these areas no longer occurs but there has over time been some seasonal use. Elders in Baker Lake have identified grave sites, as well as areas and sites of spiritual and harvesting significance in these parts of Kivalliq.

With the exception of along the route of the all-weather access road, very few of the sites (and no grave sites) identified have any potential to be affected by the Project and fewer still were considered by Inuit to be culturally important. Although western Kivalliq is rich in sites, most of these are distant from the mine area. With the finalization of the Project layout, any site within 30 km of Project facilities will be rescued or protected as needed in full accordance with GN requirements. Although there has been little recent use of the area and sites have not often been visited, their preservation is important both culturally and emotionally to Inuit. Additionally, AREVA's homeland visit program is

making it possible for elders to see parts of western Kivalliq they remember as being important to them when they were young and living on the land.

The bigger issue related to cultural heritage sites is any potential for the Project to affect the Thelon River Basin. The Thelon is culturally important not only to the people of Kivalliq, but to Dene and Métis groups in NWT who have opposed development in the upper Thelon on environmental but also on cultural grounds. The mine site is not in the Thelon River Basin, however the all-weather access road, if built, would traverse lower parts of the basin, including parts of the corridor along the Thelon River that is part of the Management Plan for the Thelon River (NWTEDT, 1990). Section 12, Assessment of Effects on Non Traditional Land Use and Land Use Planning, discusses the potential for the Project to encourage additional development, including in the Thelon Basin.

9.1.7 Residual Effects

Residual effects on traditional culture are summarized in Table 9.1-1. The practice of harvesting underpins much of the rest of traditional culture, and the expectation is that the Project will facilitate harvesting (a significant benefit) through increased income as a result of employment opportunities. However it also needs to recognized that there is potential for lifestyle changes and increased cross cultural contact to demotivate harvesting on the part of some workers (a significant negative effect).

There is also potential for increased access to resources in western Kivalliq as a result of the all-weather access road to result in what could be unsustainable harvesting levels of caribou, the Beverly herd specifically. This would be a significant negative effect however it is considered that by the time the road, if built, would be open there will be sufficient information and understanding about this herd to determine any necessary access or hunting limit restrictions. Otherwise, increased access is a significant benefit.

Any decrease in harvesting on the part of workers will not necessarily affect their food security as they will have the income to buy the food they choose, although poor choices in this regard can affect nutritional status. However, any decline in harvesting, or commercialization of harvesting in response to wage earner demand for country food, would be a significant negative effect on the food security of more vulnerable people in communities, people who depend to some extent on shared harvest for good quality, cost free food.

Table 9.1-1 Summary Impact Matrix, Effects on Traditional Culture

Effect	Project Phase	Mitigation/ Enhancement	Direction	Magnitude	Geographic Extent	Duration	Significance	Likelihood	Prediction Confidence	Monitoring
Residual Project Effects, Individual, Family and Community Wellbeing										
Resource abundance	Construction and operations	Environmental mitigation	Negative	Negligible/ low	Communities	Long	No	Low	Medium	Environmental monitoring
Access to caribou in western Kivalliq	Operations -- all weather road	Management measures as may be agreed	Negative	Medium	Primarily Baker Lake	Long	Yes	Medium	Low	Operations, collaborative monitoring
Increased access to harvested resources in western Kivalliq	Construction, operations	Public use of roads	Positive	Medium	Primarily Baker Lake	Long	Yes	High	High	Operations, collaborative monitoring
Facilitation of harvesting	Construction and operations	Work force management	Positive	High	Communities	Long	Yes	Medium	Medium	Collaborative monitoring
Demotivation for traditional harvesting and thus food security	Construction and operations	Work force management	Negative	Low	Communities	Long	Yes	Medium	Medium	
Reduction in shared harvest availability for the more vulnerable	Construction and operations	None practicable	Negative	High	Individuals	Long	Yes	Medium	Medium	
Reduced use of Inuktitut	Construction and	Work force management	Negative	Medium	Communities	Long	Yes	High	Medium	

	operations									
Loss of Inuktitut	Construction and operations	Work force management	Negative	Negligible	Communities	Long	No	Low	Medium	
Reduced traditional values and knowledge	Construction	None practicable	Negative	Medium	Communities	Medium	Yes	High	High	
Loss of traditional values and knowledge	Construction and operations	Work force management	Negative	Low	Communities	Long	No	Low	Medium	
Preservation and access to sites of cultural heritage	Construction and operations	Archaeological management, homeland visits	Positive	Low	Primarily Baker Lake	Long	Yes	High	Medium	Operations, collaborative monitoring

The Project will be a contributing factor to an ongoing process of cultural change that is expected to manifest in some reduced use of Inuktitut and some abandonment of some Inuit values and knowledge in at least in some part of the population. Cultural change is conventionally considered to be a significant negative effect of large mining projects and is so assessed in Table 9.1-1. However, it is noted that unemployment and poverty also are inducing negative cultural change, that some people choose change and others do not, and there is both public and government support (and there will be AREVA support) for people who wish to continue traditional ways. Thus outright loss of language, values and knowledge is not considered to be a significant negative effect of the Project.

No significant negative effects on cultural heritage sites are assessed. These are protected by laws and regulations, which AREVA will respect. There may be some small benefit however, insofar as the identification and study of such sites provides more knowledge of Inuit history and insofar as AREVA's homeland visit program will continue to facilitate people visiting sites of importance to them.

9.2 CUMULATIVE EFFECTS ANALYSIS FOR TRADITIONAL CULTURE

As noted in Section 8, Assessment of Effects on Community Economies, there is important potential for cumulative effects insofar as there is potential for a total of nine large mining projects to be developed in Nunavut over the coming decade, and what is considered good potential for Kivalliq participation in many of these projects even where they are not located in Kivalliq Region. In addition, initiatives underway (or as may be developed in the future) to support traditional culture, and ongoing cultural change are factors in looking forward to assess potential cumulative effects.

The same processes discussed above for the Project specifically apply to the potential for cumulative effects. It will take many years before mines are not dependent for a large fraction of their work forces on southern Canada (bring about more cross cultural contact) and English is expected to continue to be the language of work. Although the socio-economic baseline presents some evidence of resurgence of traditional culture in Kivalliq, there is also some evidence of decline in Nunavut overall and people do feel that younger people are not as committed to traditional culture as older people.

How people are able to meet the challenges of combining wage based economic activity with traditional culture will determine cumulative effects. It is fully expected that different people will take different paths, including the path of abandonment of at least some

traditional culture components on the part of some people. This has occurred in the past and will continue to occur. The issue then becomes one of how much abandonment is tolerable in the context of the strong desire to maintain traditional culture. Objectively, there are no good answers to such a question and it is clear that different people will subjectively have very different views. Loss of traditional culture would be the real threat, rather than abandonment on the part of some, because loss is irretrievable. Given the strength of traditional culture currently, loss is not considered to be an immediate threat. As noted above, ongoing efforts to validate and support traditional culture are expected to at least forestall loss. Irrespective, any cumulative abandonment of traditional culture is considered a significant negative effect.

9.3 SUMMARY OF EFFECTS ON TRADITIONAL CULTURE

Maintaining the integrity of traditional culture can be somewhat challenging in the context of much of the non-Inuit world. Irrespective of the degree to which socio-economic management measures are successful in increasing Inuit participation in the Project in culturally appropriate ways, there will as a result of the Project be a shift towards more cross cultural contact and different lifestyles. Employees and businesses will necessarily operate within the context of AREVA's corporate culture, language and operational requirements. Economic growth in Baker Lake and Rankin Inlet may imply higher percentages of non Inuit in these two hamlets.

The extent to which traditional culture has and can be maintained over time is a result of a very large number of variables, few of which can be attributable to any given project specifically. Cultural change in Kivalliq has been occurring for decades, in large part a response to centralization of settlement, increased communications, economic transition generally into the formal wage based component of the economy and the cultural and social transition that has resulted. The Project, and other large projects expected in the future, will contribute.

Climate change will also affect the resource base that underlies culture. Finally, there is recognition that the land based economy cannot alone generate the resources needed to improve health, education and other socio-economic indicators, particularly in face of continuing rapid population growth. Movement into a more successful mixed economy is therefore government policy, and was clearly demonstrated to be a priority for Kivalliq people during consultations.

There are many government initiatives in support of traditional culture and people continue to give high importance to maintaining their culture. In this context, it may be that although change will continue, that change can be managed in ways that both provide people with real choices about how they want to conduct their lives and provide avenues for maintaining Inuit harvesting, food security, language, values and knowledge in ways that meet people's needs.

This section has argued that despite some uncertainty, the Project is not expected to affect caribou herds that are also hunted in northern Saskatchewan and Manitoba by First Nations. Evidence from Lutselk'e in NWT, also concerned about the health of caribou herds, is that the cultural value accorded to the Thelon Basin is centered on the upper Thelon and the Thelon Wildlife Sanctuary,[48] which will not be affected by the Project. Thus no transboundary effects are expected in this regard.

[48] See for example this community's interventions with the Mackenzie Valley Environmental Impact Review Board on proposed mining activity in NWT (MVEIRB, 2011).

10 ASSESSMENT OF EFFECTS ON INDIVIDUAL, FAMILY AND COMMUNITY WELLBEING

Potential effects on individual, family and community wellbeing are complex, far reaching, and unpredictable. Wellbeing is intimately associated with potential effects on community economies and traditional culture as discussed in Sections 8 and 9. In addition however, increased incomes, rotational work stresses, risks to public health and safety and changes to social capital are other drivers that have the potential to affect wellbeing. There are also numerous mutually reinforcing and counteracting linkages between both drivers and their effects. For example either of increased disposable income or job stress can lead to substance abuse, but the combination of the two may be the trigger for some people.

Most Project effects on wellbeing would be expected to be positive. However in the circumstances of Kivalliq, there are a number of confounding factors that raise concerns, including cultural change, negative social pathologies and challenges to accessing to Project benefits. Many, but not all, people in Kivalliq will benefit from either the employment offered by AREVA, employment by businesses supplying AREVA or induced economic opportunities. For some who do access economic opportunities, poor personal choices can be made. For those who do not, many of whom are likely to be the most vulnerable, whose educational achievement and/or personal challenges constrain their capacity for economic participation, there can also be negative effects.

10.1 RESIDUAL PROJECT EFFECTS ASSESSMENT ON INDIVIDUAL, FAMILY AND COMMUNITY WELLBEING

10.1.1 Analytical Methods

The assessment of residual effects is considered in terms of selected component parts of wellbeing – health, family function, savings, public security, public health and safety, and social cohesion and participation.[49] The assessment is necessarily qualitative. The results of consultations and of socio-economic and IQ data collection are essential to the

[49] As noted for Section 9, Assessment of Effects on Traditional Culture, this is again an artificial breakdown and there are many inter linkages, both between each of these component parts, and between these components and other determinants of wellbeing such as income, education and culture.

discussion of effects on wellbeing. Again, the range of experiences and aspirations of people across Kivalliq, both between and within communities, means that it is challenging to generalize. There is also sometimes a distinction to be made between wellbeing, and people's sense of wellbeing. It is of course AREVA's, and governments', intent to put in place opportunities for people to improve their quality of life in the ways they choose, and mechanisms to assist those who for whatever reason are unable to do so.

10.1.2 Health

The Project is not expected to have negative effects on infectious or chronic diseases, nor on the physical health of workers. There is some potential for positive effects, through worker health and safety training, income effects on overcrowded housing conditions that are considered a major contributor to the spread of infectious diseases, and what is generally believed to be a positive correlation between employment and improved physical and mental health. Increased incomes enable healthier lifestyles. However there are a number of potentially confounding factors. Concerns centre on the consequent health effects of increased substance abuse, changes to diet and inappropriate sexual behaviors.

Whereas there is evident concern that increased disposable income can lead to more drug and alcohol abuse, people in most communities generally see such abuse as an ongoing challenge, a challenge associated with not just employment but also unemployment and other factors (see Box 10.1-1). The box also provides some evidence of a range of views on what the groups of people are who abuse (although most people can identify individual abusers within their communities), why they abuse, what the consequences are and what the responses should be. This is of course is not unexpected given the complexities of substance abuse.

Box 10.1-1 Perspectives on Drug and Alcohol Abuse

The youth aren't the problem drinkers and they don't do a lot of drugs, probably because they don't have much money.

The young don't seem to obey any more, they just want to do what they want – sleep, play on the internet, watch TV and do drugs.

Tightening up on alcohol results does not result in more use of drugs.

When alcohol is controlled, people just replace alcohol with drugs. And there is always a new drug to try.

People need an identity to frame goals for themselves, which helps them stay away from drugs and alcohol and suicide.

Alcohol and drug abuse is essentially 'self-medication' in face of lack of services to deal with problems.

White people have brought material possessions to Nunavut, including drugs and alcohol, and then are trying to bring jobs that will give people the money to buy these things. This in turn requires Inuit to have educations, papers, etc. (which is not the traditional way). The whole thing is a trap, resulting in people abandoning their identity.

Parents are not bringing their children up correctly and that is why they are doing more drugs and alcohol and spending time away from home.

Alcohol abuse is more a problem for the unemployed, but employed people do get drunk.

People who already have drug or alcohol problems when hired, will likely show escalation in problems. People without drug or alcohol problems when hired are not likely to start.

The drug and alcohol problem here is already bad and may become worse with lots of employment.

Mining projects can offer jobs that represent that new life, and jobs are certainly necessary, but with more disposable income there is more drug use.

Drugs contribute to poverty. Cannabis products are addictive, and people start not only using their money to buy drugs, but eventually start selling family property. This in turn leads to family conflicts.

Too much drug use means children aren't cared for, food cannot be paid for and people are eventually unable to work.

Drugs are bad because they steal kids' motivation.

The church's message, taken from the bible, is that alcohol makes people lazy and that drugs make eyes red and makes people poor. The bible talks about what doing bad things does to people's behaviours and lives, what people will be like if they do specific things.

Mining companies need to take the advice of Inuit on who to hire and who not to hire. The Inuit know everybody and can advise on whether people are doing drugs, have criminal records, are able to work well.

Most people, including addiction counselors and police, note that currently drug use in Kivalliq is primarily of cannabis products. There is some consensus in Baker Lake and Rankin Inlet that, despite fears, harder drugs have not yet started to flow (although social service delivery staff are acutely aware of the dangers). Nor do people in Baker Lake believe that drug abuse has increased with Meadowbank, although people in all communities note that abuse is often hidden, not visible. To the extent that there is a relationship between mining and drug abuse, this was most often said by people in Kivalliq to be attributable to white mining employees importing drugs, rather than to increased abuse among the Inuit. This was said to be particularly egregious insofar as white supervisors of Inuit were believed to have used their relationships of power to induce Inuit into marketing transported drugs. In this regard, Agnico Eagle has since increased its security measures at southern points of hire which is believed to have addressed the problem.

Nor do people in Baker Lake believe that alcohol abuse has increased in association with Meadowbank. Police note that calls that involve alcohol abuse, often also involving domestic violence (see Section 10.1.3), are higher on the days that Meadowbank rotational shifts end, but are also higher on other days of 'moment', such as days of alcohol delivery. There are controls on the amounts of alcohol that can be accessed in all communities, even considering that there are ways around these. Thus it may be, as people observed, that the timing of abuse can be linked to Meadowbank activities, but there are limited opportunities to increase the amount of abuse. It may also be the case that the discipline required by an alcohol (and drug) free work place mitigates the potential to develop addictions.

There is evidence of an association between wage employment and increasing rates of substance abuse in the Canadian north, although this most often seen in environments where access to alcohol, particularly, is open (see Section 7, Comparable Experiences). And it is certainly the case that some individuals will choose to use new income and/or cope with job stress in ways that do not create benefit for themselves or their families. But there is also evidence of the opposite – that substance abuse is related to socio-economic and cultural challenges that can erode self-esteem, a process that employment can reverse. Gibson and Klinck (2005) and Sly et al (2001) in their reviews of the literature come to no conclusions about any necessary relationship between

substance abuse and employment on the part of individuals, nor has monitoring in NWT suggested any community level effects.

The linkages between employment and substance abuse are therefore expected to vary from person to person.[50] To the extent that there are individuals who make poor choices, GN services and public health education programs, as well as AREVA's on site counseling, EFAP and health and safety training are intended to both prevent and manage poor choices. However, AREVA's programs will reach only its own employees and their families and there will be also increased employment in the expanding economy. Addiction counseling services are stretched, there is little capacity to manage associated mental health issues, and social service staff are wary that high drug prices in the north will attract more aggressive marketing.

The health benefits of traditional diets are well documented and well appreciated by Inuit. Whereas reduced activity on the land can have implications for consumption of country food, this becomes a health concern where that consumption is replaced by poor quality bought food, or worse, where it cannot be replaced and people go hungry. Diabetes is a primary concern. Employment offers at least the possibility that for those people who consume less country food as a result of employment,[51] healthy alternatives are affordable. Again, the response will vary from person to person and to some extent can be mitigated with health education by both government and AREVA. However given the struggle in most developed economies to see that people eat well and control their weights, the danger of diet changes and consequent health effects is real.

It seems clear, from people's comments about Meadowbank and the frequency with which spousal jealously was spoken of during socio-economic baseline discussions, that what many would consider to be in appropriate sexual behaviors are an issue. The sensitivity of the subject makes it difficult to come to any concrete conclusions as to how different sexual behaviours are at Meadowbank, and might be at the Project, than they are when people are at home. However anecdotal evidence overall suggests that it is likely that consensual (but adulterous) sex, prostitution and sexual harassment (potentially extending to rape) do occur at Meadowbank and will at the Project. Whereas work force management measures will discourage harassment and encourage people, women specifically, to come forward if it occurs, the control of other sexual activity is somewhat problematical.

[50] This would also apply to gambling, also said to be a problem in some communities but not generally noted as a problem of addiction by addiction counselors.

[51] This can be either because of a shortage of time for activity on the land, or as increasingly is feared, less interest and/or ability to harvest on the part of the young who may now have income to buy alternatives.

People in communities have suggested mitigation measures, such as employing only men at mine sites and testing potential employees for STIs with a view to denying them employment. Such measures however contravene human rights and cannot be put in place. Aside from other negative effects of inappropriate sexual behaviours (see Section 10.1.3), the very high rates of STIs in Nunavut suggest cause for concern, particularly in regard to HIV which has not yet been a major health problem in the territory. As for substance abuse and diet, public health education by government and AREVA may go some way toward mitigating potential negative health effects.

10.1.3 Family Function

As for the discussion on health above, normally there is a positive relationship between income and family function. However, again there are confounding factors. The integrity of families has potential to come under threat from various sources, including poor decisions on uses of new income, stresses related to rotational work both for workers and families left at home, fears (however real) of infidelity during separations of spouses during rotational periods[52] and changing cultural roles.

The more serious consequences of poor family function include domestic violence – often alcohol related, divorce and resultant single parent households, and mental health challenges including suicides.[53] Incidences of all of these are already too high in Nunavut. With the exception of suicide perhaps, women are considered to be more vulnerable as they are more likely to not be working and more likely to have responsibility for young children. Their children of course are also very vulnerable.

Much has been written on the potential effects of rotational employment on the families of employees. Sly et al (2001) summarized these in 2001, and more recent studies of individual project cases converge on the same conclusions (Gibson, 2008; Intergroup, 2005). The positive effects can include reduced cross cultural contact within communities on the part of southern employees, time and resources available for harvesting and more workforce discipline while on the job, contributing to long term capacity building. Negative effects can include personal stress, discord within the family between generations and between spouses, breakdown of traditional values of sharing and mutual support, and increased substance abuse. What the literature generally finds is that what people find is good about rotational employment is essentially the reverse of what they find is bad (see Box 10.1-2). For example, rotation puts stress on families

[52] This includes infidelity both by workers on rotation at the work site and by spouses left at home in communities.

[53] This is not to say that poor family function is the leading cause of suicide, but that in the absence of strong and supportive families, the threat of suicide is elevated.

during times away, but allows more time with families when at home, and rotational work interferes with the timing of activity on the land, but provides the time and resources to spend more time on the land.

Box 10.1-2 Perspectives on Rotational Work

Some men don't want their women to work in camps, they are afraid of harassment.

Rotational work allows people to live where they choose rather than close to projects.

A two week on/two week off rotational schedule is good, it gives people time to be with their children and take them out on the land.

Isolation at work camps can be hard to bear but enough phones and community radio would make this easier.

Spouse can find the house too quiet and the work too much when one is away but people can get used to this.

Stress and burn out are now behind some of the family violence, when it used to all be alcohol related.

Actual effects will depend on the success of work force management measures in accommodating individual needs, the effectiveness of counseling services, and the capacity on the part of individuals to manage the lifestyle, importantly through the personal choices they make. As noted elsewhere, rotational work is not for everybody. The danger lies in the possibility that in the case of someone for whom rotational work does not work very well, it is not given up quickly but is pursued until negative effects play out with serious consequences. As for substance abuse, stretched capacity to address mental health issues is the context within which such problems would occur.

It is also noted that failure to find employment, while many others are more successful, also creates individual stress. Sly et al (2001) notes that suicide rates are correlated with vulnerability created by being caught between the wage and land based components of the economy, which can be interpreted as an inability particularly in young males, the most suicide prone, to succeed at either. Hicks (2009) also notes the apparent relationship between suicide and cultural change.

Aside from rotational work, cultural change expected as a result of the Project but also of more wage employment more generally has implications for family function.

Traditionally, harvesting was strongly tied to gender and intergenerational roles and to the pattern of social relationships. Hunting was strongly linked to male identity, with women responsible for processing much of the harvest and for caring for children. Authority was vested in elders, with their vast knowledge of and experience on the land. Group decision making, reciprocity, sharing, teaching and learning (as well of course of environmental conservation) were essential to subsistence livelihoods.

Although the livelihood imperative is somewhat less now, and would become yet more so with increasing wage employment, expectations of roles and relationships persist and are integral to identity and wellbeing. At the same time, the 'south moving in' introduces new opportunities, expectations and requirements. In the wage based component of the economy there are opportunities for women in the work force, potentially as bread winners of their families. There is new income, coincident with access to a very large range of commercial goods. Workers are required to attend work regularly, and to have education and job experience. New technologies are not always understood by elders. These and other factors have implications for roles and social relations, some of which are manifested in substance abuse and suicides, but also poor family function – inter gender and inter generation misunderstanding, conflict and violence – that can culminate in family breakdown.

As for most other components of wellbeing, AREVA's capacity to respond is limited to culturally appropriate work force management measures that support people and their families in successful management of rotational work. There is also an important role for government in this regard.

10.1.4 Savings

At an aggregated level Nunavut has a savings rate that is higher than anywhere else in Canada, at over 30%, and is much higher than the rate for Canada as a whole, which is 4%. This however does not translate into a large amount of savings, nor are many of these savings benefiting Nunavut, as many are held in investment accounts outside the territory and as much of this is exported out when highly paid high savers leave the territory at the end of their contracts. The socio-economic baseline includes references to businesses in Kivalliq finding it difficult to access credit.

This high savings rate is projected to continue over the coming years. The Conference Board of Canada (2010a) has projected income, disposable income and savings rates for Nunavut to 2020. Incomes are expected to rise by almost 80% over the decade, but the savings rate is forecast to remain at 31% to 33% in all years. These forecasts take into account the construction and then operations of Meliadine. Thus the Project, with employment levels that are expected to be similar to Meliadine, is unlikely to affect the savings rate.

At the household level, it was frequently observed, by both Inuit and non Inuit, that in face of rising incomes, people will need assistance with personal financial management. Additionally however, younger people spoke of cultural expectations making it challenging for them to save, to the extent that some expressed the notion employment would not bring any tangible benefits (increasing rents were also part of this equation).

AREVA will include personal financial management components in its training programs. It is expected that at least some people benefit from increased economic opportunities will be able, and choose, to save. Although not reflected in savings rate data, to the extent that people feel they are able to move into private housing (see Section 11.1.4) because they have secure employment, this also may be considered to represent savings.

Good personal financial management that permits savings is a contribution to household economic security which in turn has a beneficial effect on family function, personal feelings of self-esteem, resilience in the face of adversity and, at the limit, some potential to reduce dependence on government transfers.

10.1.5 Public Security

Project effects on public security would result if there were increases in crime and public nuisance behaviours, as a result of in migration (more people), increased drug trafficking, substance abuse and domestic violence, and/or developing inequities that encourage crime. Although increased incomes have potential to remove one of the motivations for some crime, police say that more income equates to more police activity simply because more people have more money to do more things. Crimes on this account however, unless involving violence as a result of alcohol abuse, are not always the most serious of crimes. It is noted that there are also other drivers of crime rates, most notably the percentage of the population that is young – as Kivalliq's population ages, some downward pressure on crime rates can be expected, although this may take some time to manifest.

Crime rates are already high in Kivalliq, although substantially lower than in Nunavut overall. Violent crime rates had not changed much in the decade to 2009 but total crime rates show an upward trend with time. At the community level, crime rates are too variable to observe trends – for example, it is not possible to determine trends in Baker Lake in correlation with Meadowbank. It may prove that violent crime rates, lower in

Baker Lake in the period 2007 to 2009 than in the period 2002 to 2006, will show a clearer trend in future years.[54]

Despite high crime levels, most people feel their communities are safe, and good places to raise children. This may be because the experience of crime at a community level is somewhat different than the statistics might indicate. Violent crimes are most often a result of domestic disputes rather than random aggression in public. Property crimes are often breaking and entering of community facilities (often to take food it is reported) rather than private homes.

As previous subsections have discussed, it is considered that Project effects on socio-economic parameters such as substance abuse and domestic violence are overall expected to be positive, albeit negative for some individuals. In turn, effects on crime and public nuisance behaviours at the community level are not foreseen on these accounts.

It is however expected that increased incomes and in migration into Baker Lake and Rankin Inlet will result in more crime, if not necessarily an increase in crime rates, and if not necessarily an increase in violent crimes. Increased incomes in other communities, where there are proportionately a large number of newly employed, may also be expected. It is likely that people will hear about more incidences of crime as well, which can affect perceptions about public security.

It may also be that developing income inequities have consequences. Although an important benefit of the Project will be to increase incomes, both in aggregate at a community level and for many individuals, not everyone will benefit, and certainly not all will benefit equally. Even in societies that don't place strong value on equity, property crime can seem to some people an appropriate means of wealth redistribution (see for example Andrienko, 2003).

There is an association between out of area mining workers, largely men on single status and/or with good income, and such public security concerns as prostitution, harassment, and other negative social behaviours such as drunkenness. The Project will include the construction and operation of docking facilities in Baker Lake and there will be employees resident in the town. As at the mine site, AREVA expects enforcement of its worker code of conduct, and the openness to expression of any complaints on the

[54] Very recent data provided by the RCMP to the Kivalliq SEMC suggests that particularly property crimes have spiked since 2010 but violent crimes have also increased. It is not yet clear how much of the increase in violent crime is associated with domestic violence, public behaviours and/or increased numbers of people in the hamlet.

part of Baker Lake residents about out of area workers, to address some of the potential for negative effect.

AREVA's responsibility for preventing and controlling crime and public nuisance behaviours is limited. The RCMP and community justice committees have responsibilities in this regard. Notionally an increase in police presence could prevent some crime although this is not a complete response as incidence of crime tends to generally correlate better with factors other than the number of police.

10.1.6 Public Health and Safety

Mining Safety

Health and safety of workers and of the broader population is subject to legislation and perhaps more importantly to best practice, as outlined throughout the EIS. AREVA's experience in northern Saskatchewan, and Technical Appendix 8A, Human Health Risk Assessment, suggest that while there will always be some risk, health and safety practice is expected to minimize this risk. AREVA will not only comply with legal requirements but also seek to continually improve its safety records through application of best practice.

The dissemination and enforcement of clear workplace health and safety regulations, health and safety training, provision of safety equipment, emergency response planning, availability of medical and evacuation services for work forces and other health and safety measures as are appropriate will be continually implemented, monitored and improved upon where possible. Health and safety training also has applications in personal life – workers often not only use new health and safety training on the job but at home in the course of daily tasks. Risk cannot ever be entirely eliminated however.

Traffic

Rather than risks related to the mining, processing and transport by plane of uranium, it is expected that the primary risk to public health and safety will be related to the potential for traffic accidents, either involving Project vehicles, or of people using either the winter road or the all-weather road should this prove needed for the Project. Health and safety best practice briefly described above includes driver training, codes of conduct and safety equipping of course, and the larger transport movements of the Project will not

pass through Baker Lake.[55] However, as noted in the socio-economic baseline, the driving of all-terrain vehicles and snow machines is more dangerous than the driving of cars and trucks and, probably on that account, Nunavut's accident rate has been fairy consistently higher than that of Canada on a per kilometer driven basis.

Built roads permit higher speeds than travel on the land and may contribute to accident rates and seriousness. In mitigation, checkpoints and the volumes of Project traffic will contribute to ensuring that in the event of an accident, assistance will be closer at hand than it would be away from either road and the Project will of course fully cooperate with search and rescue teams in any event of an accident. The Meadowbank experience with their all-weather road, in operation now for over four years, is illustrative. People are reported to be respectful of the rules of road use (speed and vehicle type restrictions for example) and there have been no injury causing accidents.

Perceptions of Harm

Public safety in relation to uranium mining has been uppermost in most people's minds through AREVA's consultations. Box 10.1-3 provides an indication of the kinds of questions that have been and continue to be asked of AREVA. There have been many environmental concerns, but more generally people are worried that they don't understand, and can't see, what may be happening to them, to their culture and to their children in the future. A detailed review of engagement results also suggests that whereas some people are in fact confident in the environmental stewardship of modern mining companies, others are supportive of the Project, in despite of fears, only on the grounds that will provide needed economic opportunities.

Box 10.1-3 Understanding of Uranium Mining and its Effects

Uranium gets into animals and people eat them, will we get sick?

Baker Lake flows to the sea. Uranium is going to impact all that water, and our sea mammals. Our water is pure and pristine today, but that's going to be damaged.

What about dust pollution coming from uranium mines, our air is different up here. How are we going to be able to maintain our wildlife, our caribou habitat and our people?

[55] As presented in the Project description, AREVA is projecting that heavy transport for the Kiggavik Project could be as high as 3,300 trips (one way) per year, equivalent on the winter road to 36 trips per day, and on the all weather road to about half that. There will also be regular use of smaller vehicles, including in Baker Lake.

What about impacts to our wildlife, our pride, our traditional culture.

A lot of the Inuit today don't rely on caribou as part of their food group because of concerns they have been affected by mining.

After the mine closes, they will have to put away the waste in a safe manner.

They are saying it will create jobs, but what will happen when there's a leakage? Who will help us?

We understand that you cannot see with your eyes what contaminates our environment.

Because of my lack of understanding, I have fear in my heart.

We have heard from both sides, pros and cons. It is confusing for communities.

Some people are against and some people are for uranium mining. Sometimes we hear that there is not any danger from uranium mines, but some people say it is quite dangerous.

After we're gone, our children will be living. They will have to deal with uranium mines, which will damage future generations.

Our children's children will be hunting two headed caribou.

While not general, some people indicate that an expectation of (invisible) contamination could lead to a fear of country food. As discussed elsewhere, the maintenance of elements of traditional diets are important both to cultural integrity and to health. People have tales of observed differences in, as examples, the skins of polar bears and the meat of caribou, which they attribute to existing environmental contamination and note that where these things are noticed people choose to throw away rather than consume what they see to be contaminated harvest. People will need objective, and trusted, information on uranium mining to ensure that they are not basing harvesting decision of false fears.

AREVA has held, and will continue to hold, public information and education events on uranium mining and its risks. Presentation of environmental monitoring results, and visits to uranium mines in Saskatchewan and to the Project when it is operating, are other avenues to provide people with information and provide opportunities for questions. Public discussion of the pros and cons of uranium development and eventual policy decisions on the part of GN and NTI will also in the longer term bring to people more confidence in their knowledge, and consequently less fear should uranium mining

proceed. This however will be a process that will take some time to take effect, a process that may not come to a conclusion quickly given ongoing struggles for public opinion, and some lack of confidence in parts of the population that government and AREVA necessarily have people's best interest at heart.

10.1.7 Social Cohesion and Participation

Social capital represents the ability of people to work together to identify, understand and manage the opportunities and challenges they face as they advance towards the goals that they themselves establish. It is a function of satisfaction of basic needs such as health and education, but equally of well-grounded social networks, mutual understanding and cooperative relationships (social cohesion). Experience in participatory mechanisms and the learning that comes with collaboratively producing results through these mechanisms are also important to strengthening social capital, as are institutional strength and political empowerment.

Construction and operations of the Project will be a force of change – movement into the wage based component of the economy with all that implies for traditional culture and wellbeing, likely in migration to Baker Lake and Rankin Inlet, and some developing inequities. Much of this change is highly desired, as some people clearly want to move into wage employment. However, it can be challenging to manage change effectively and change does have significant potential to undermine social relationships, to the disbenefit of some, particularly of the more vulnerable.

People give very high importance given to social cohesion in Kivalliq. The potential for the Project to contribute to some weakening of traditional culture may in turn generate a weakening of social cohesion, which has served people well over the years, in response to very challenging conditions for earning livelihoods (see Box 10.1-4). Reduced social cohesion can reduce a sense of wellbeing. There are also comments in the box however that indicate that some people feel that working for Meadowbank has contributed to social cohesion, and that in some communities there is some desire to see some social networks loosened.

Box 10.1-4 Perspectives on Social Relationships

A bad effect of employment is that some people also become greedy and may not share as much as they used to or should.

The traditional Inuit value of sharing is disappearing. People are less willing to share when they see what is happening to what they have to offer, how it is used and how people treat their families, especially their children.

People are getting stingy with their harvests, it is getting harder to find people who will give away caribou.

Equality is a traditional value and mining jobs mean that some people have a lot more than others.

Mixing of Inuit and non Inuit might affect culture.

Where people don't go out on the land as much, like the young and people who are busy working, people are starting to go into the business of providing country food.

Providing for the family now means making money, and wages are shared with parents, siblings and other family members.

The economy has already changed so much that people feel they must get a pay check to live reasonably; that they can't really participate the way they want to in community life unless they have money.

I am working but I am a member of the community and can't let my fellows see me doing bad things so now I am able to stand up to my employers.

We are all friends now from working together on site. Working has brought people (who didn't previously know each other) together, which is a good thing.

If you have a problem and try to solve it, you will find that whoever you have the problem with has a relative or friend that will intervene with some sort of point of leverage to make the problem just go away and leave you with no recourse.

Traditional families here are all powerful.

One family here has all the jobs, which are 'inherited'.

With regard to in migration, different groups of Inuit do feel distinct from other groups. The most obvious example is that a major distinction is made between coastal people and the inland people who make up most of the Baker Lake population. People say that Rankin Inlet has already seen the arrival of different Inuit (and non Inuit), and that society there is more diverse so absorption of different people is not something to be overly feared. Baker Lake shows some evidence of lack of welcome to migrants, both at the family level (which seems more an issue of inconvenience, expense and crowding) but also at the community level. This is expected to change with time, as the hamlet becomes more varied in its population and more accepting of its diversity. It is also noted

in this regard that there were no reports of any specific problems in Baker Lake with migrants that have arrived from other communities or from those migrants themselves.

Engagement, and indeed AREVA's experience with people to date, has indicated that some people are concerned about the distribution of the Project's (and other) economic benefits. Some communities see themselves as left out and some people feel that they will not experience significant benefit while others will. Developing inequities can undermine social cohesion. There is also some evidence of potential for social conflict related to strong opinions about uranium mining. Such divergences in interests have potential to create social conflict.

People also give very high importance to participation in decisions that affect them. Interaction by people (but also governments and other organizations and institutions at both the local and regional levels) with the Project, its workplace environment, its effects and the socio-economic management measures put in place have very broad positive implications for participation. Participation in turn relates back to social cohesion – through collaborative learning and problem solving.

The socio-economic baseline indicates that there are some ineffective interactions between hamlets and the outside organizations and agencies, including government, that materially affect quality of life. Collaborative mechanisms, for monitoring for example, bring people together to achieve common goals and objectives. AREVA is currently providing and will continue to provide support and create opportunities for both people and their organizations – whether pre-existing organizations or those created in response to the Project such as Baker Lake's Community Liaison Committee – to enhance their capacity to engage with the Project, learn and participate in decision making that affects them.

It is also arguable that AREVA's engagement throughout the development of the Project to date, and responsiveness to concerns, including changing the project design (the road and the transportation of yellowcake being prime examples) represents empowerment – people can see that their input is valued and used.

10.1.8 Residual Effects

Table 10.1-1 summarizes what are expected to be the Project's effects on individual, family and community wellbeing. These are overall considered positive for most individuals and families, and thus contribute to community wellbeing. For most people in communities, health status will improve, families will function better (although roles will evolve) and households will have more opportunities to save, all considered significant benefits. Although there are concerns about further spread of STIs, solid health education programs of AREVA and government are expected to go a long way towards addressing these, but negative effects may still occur.

Table 10.1-1 Summary Impact Matrix, Effects on Individual, Family and Community Wellbeing

Effect	Project Phase	Mitigation/ Enhancement	Direction	Magnitude	Geographic Extent	Duration	Significance	Likelihood	Prediction Confidence	Monitoring
Residual Project Effects, Individual, Family and Community Wellbeing										
Overall health status	Construction and operations, positive effects are expected to grow with time while negative effects will largely be seen in early years	Economic opportunities, health and safety training	Positive	Medium	Communities	Long	Yes	Medium	Medium	Collaborative monitoring
Infectious and chronic disease rates		Economic opportunities, health and safety training	Positive	Low	Communities	Long	Yes	Medium	Medium	
Substance abuse and gambling)		Work force management, life skills training, counseling	Negative	High	Individuals	Medium /long	No	High	High	
Diet		Work force management, health and safety training	Positive /negative	Medium	Individuals and families	Long	No	Medium	Medium	
Inappropriate sexual behaviours		Work force management, codes of conduct	Negative	Low	Individuals	Long	No	Medium	Medium	
Increases in STI rates		Work force management, codes of conduct	Negative	Low	Communities	Long	Yes	Medium	Low	

Overall better functioning families in response to economic security and personal self esteem		Economic opportunities, work force management, counseling	Positive	Medium	Communities	Long	Yes	Medium	Medium	
Poor management of incomes and stressors, leading to domestic violence, divorce, children at risk, suicide etc.		Work force management, counseling	Negative	Medium	Individuals and families	Long	No	High	High	
Increased household economic security with savings		Economic opportunities, life skills training	Positive	Medium	Communities	Long	Yes	Medium	Medium	
Increased rates of crime and nuisance public behaviours		Work force management, codes of conduct	Negative	Low	Communities	Long	Yes	Low	Low	
Increased incidence of crime and nuisance public behaviours and consequent lower sense of wellbeing		Work force management, codes of conduct	Negative	Low	Communities	Long	Yes	Medium	Medium	
Worker and public health and safety related to mining		Health and safety training, public education	Positive	Low	Communities	Long	Yes	Medium	Medium	
Public health and safety related to traffic		Traffic management	Negative	Low	Individuals	Long	No	Medium	Medium	
Safety on the land		Public road	Positive	Low	Communities	Long	Yes	Medium	Medium	

		access								
Perceptions of harm		Public education	Negative	Medium	Communities	Medium	Yes	Medium	Medium	
Social cohesion		Work force management, engagement, collaborative monitoring	Positive /negative	Low	Communities	Long	Yes	Medium	Medium	
Participation		Engagement, collaborative monitoring	Positive	Medium	Communities	Long	Yes	Medium	Medium	
Social conflict		Work force management, engagement, collaborative monitoring	Positive /negative	Low	Communities	Long	Yes	Medium	Low	

For some people, there will be negative effects in this context of overall benefit. It is again noted that there will be an adjustment period during which more negative effects may be expected until people learn to manage the income and stresses that new employment brings. As well, more negative effects can be expected earlier because construction work can be shorter term contract work and not provide as much a measure of security as would operations work. People are more likely to struggle as they transition into the wage based component of the economy than they will once they have been through the construction and/or early years of operation and determine the path forward that works for them and their families. Negative effects on individuals are not expected to occur with such frequency that overall community wellbeing suffers.

There is one exception. Project is expected to have a significant negative effect on public security, particularly in Baker Lake and Rankin Inlet. Again, there may be an adjustment period during which effects stabilize and/or can be better managed by police and government, and it is not certain that rates of crime, as opposed to incidences of crime, will increase over the longer term. However with more people and more activity in these two communities, people's perceptions that they are secure in public can be expected to lessen, a significant negative effect on a sense of wellbeing at a community level.

No significant negative effects are expected on public health and safety, although risk cannot be completely eliminated. Rather, worker health and safety training can result in improved public health and safety, a benefit. Use of the controlled access road, whether this is a winter or an all-weather road, is considered safer than travel elsewhere on the land and is therefore a significant benefit. There will continue to be for some people a perception that they are in harm's way, or could be. This is a significant negative effect on those individuals' sense of wellbeing. Again, this is expected to lessen over time.

Although there is potential for reduced social cohesion, the degree to which people are able to join together in empowering processes of participation in the Project will be a counteracting factor. How social cohesion and participation interrelate to produce an increase or decrease in social conflict is undetermined.

10.2 CUMULATIVE EFFECTS ANALYSIS FOR INDIVIDUAL, FAMILY AND COMMUNITY WELLBEING

As for other socio-economic effects, the expected rapid expansion of the mining sector could very well accelerate the various effects foreseen on individual, family and community wellbeing, as the same processes apply. Many of these effects are additive, similar to Project residual effects but more prevalent. Significance would also parallel that determined for Project residual effects.

However it is also arguable that at some undetermined point in time a critical mass of healthy and well-functioning individuals and families can provide a shift in the understanding of possibilities and aspirations of the balance of the population. This may for example have occurred already in Baker Lake. Role models are important, and more valuable insofar there are many of them who have not achieved their status on the basis of extraordinary talent, but more on the basis of more easily achievable personal goals such as regular attendance at school and work. This would a significant cumulative benefit.

It is also noted that as more economic opportunities open, as people have wider choices on how to earn their livelihoods and as people adapt to the results of those choices, fewer people are left out. This has potential, in the longer run, to limit the negative effects of inequities for example, on crime and social conflict, an additional cumulative benefit of significance.

10.3 SUMMARY OF EFFECTS ON INDIVIDUAL, FAMILY AND COMMUNITY WELLBEING

The actual cause and effect relationships between employment, traditional culture and wellbeing have proved extremely difficult to capture in the context of the north. Wellbeing parameters in communities affected by the diamond mines in NWT have not evolved as negatively as might have been expected, given the conclusions of various project environmental assessments prepared for the diamond mine projects, but this does not definitively prove that they would have not been yet better in the absence of the mines.

There is ample evidence world-wide that employment and good incomes are overall associated with improved wellbeing. And it can only be expected that the same relationship would hold true in Nunavut. There will be individuals and families that disbenefit, there will be an adjustment period and there will be some community level manifestations of at least a reduced sense of wellbeing in some respects. It is important to recall that the potential negative effects on traditional culture are a very strong component of overall community wellbeing.

Because overall community level effects are expected to be positive, non Inuit will benefit as will the Inuit. The potential for most potential negative effect at the individual and family level is rooted in the challenges of transitioning to the wage based component of the economy and in existing socio-economic health and education conditions for Inuit. Neither of these apply, generally, to the non Inuit population and where they may apply, the non Inuit have more resources with which to cope.

Climate change is a potentially additional source of stress and as such has some potential to affect wellbeing as other stressors, such as rotational work and shifting social roles, do.

No transboundary effects are expected.

11 ASSESSMENT OF EFFECTS ON PUBLIC INFRASTRUCTURE AND SERVICES

11.1 RESIDUAL PROJECT EFFECTS ASSESSMENT ON PUBLIC INFRASTRUCTURE AND SERVICES

Effects on public infrastructure and services are essentially manifested as the balance between supply and demand. The Project will not affect supply (although it is noted that the RCMP is already contemplating what implications rapid expansion of the mining sector in Nunavut may have for policing needs), but could affect demand through multiple, complex and often mutually reinforcing linkages. Effects can result from:

- shifts in demand (there is potential for both reduced and increased demand) of already resident populations in face of increased incomes and/or wellbeing effects associated with economic, social and cultural change

- increased demands as a result of population growth associated with in migration, as well as the reverse as a result of any out migration

- any Project demands on infrastructure or services such as for example health services, roads, other transportation facilities, telecommunications and utilities.

With regard to the last bullet, meeting the operational needs of the Project and the needs of its large out of area workforces is part of AREVA's response to limiting pressures on public infrastructure and services. AREVA will ensure that its power, communications, transport and other operational needs do not depend on communities' facilities to the extent that this is possible,[56] and that where such facilities that are used, for example local roads and the airport, these are paid for and/or maintained as needed. Food and accommodation, recreation facilities, physical and mental health services and other goods and services as may be identified as necessary will be provided at the mine site independently of what is now available in Baker Lake or Rankin Inlet, barring exceptional emergency circumstances. Project demand on public infrastructure and services is therefore not considered further.

[56] There will of course be use of municipal services in Baker Lake.

11.1.1 Analytical Methods

As noted earlier, quantification of many of the drivers of increased or decreased demand for public services and infrastructure is not really possible with any reasonable level of confidence. Further, most effects on public infrastructure and services are expected to gain momentum during the Project's operations phase, when household economic security is more assured and most migration decisions – affecting population growth rates – are made. It is not currently clear what capacity constraints on public infrastructure and services will be in 2021, or what this may imply relative to what government revenues may be in face of ongoing development of the mining sector. Therefore, the assessment of residual effects on public infrastructure and services is qualitative.

11.1.2 Social Infrastructure and Services

For purposes of this subsection, social infrastructure and services include health, education and counseling services and social assistance. Increased employment and contracting opportunities will result in increased incomes, in turn resulting in less demand for social assistance. Increased incomes are associated with improvements in wellbeing. A measure of economic security, improved health status and improved self-esteem of the newly employed and their families should in turn translate into reduced demand for mental and physical health and counseling services. Although there will be individuals who struggle, as there are now, the net effect might be expected to be some reduction in demand for health and counseling services. With regard to education, demand would be expected to increase in response to employment opportunities.

There are two confounding factors. The first is population growth that may be attributable to the Project, as a result of in migration in Baker Lake and Rankin Inlet. Recent population growth in these two hamlets is both faster than it has been historically been and faster than current GN projections expect.

In 2009 and 2010 at the time of socio-economic baseline data collection, health staff were concerned about the implications on people's mental health of a lack of capacity to deliver mental health and addiction services. However, this was related to unavailability of facilities and services, rather than numbers of users. Health staff did not report any incapacity to respond to demand for services they were competent to deliver. Some capacity constraints had started to become evident in some schools however, in Rankin Inlet and Arviat for example. This was being seen at both the primary and secondary levels.

What the situation may be in 2017, and 2021, is harder to judge. Populations will continue to grow and capacity constraints will become evident, or more evident, in the

absence of planning and implementation of both more infrastructure and staffing on the part of the GN.

The second factor to consider is that increased demand for health and education services can be expected from people who are better off financially. Better health status does not necessarily reduce demand for health services – the socio-economic baseline notes that visits to doctors in Kivalliq do not seem to correlate well with health status. Increased health awareness typical of mining workers who are exposed to health and safety training may be associated with both higher demand for the services that are currently available, and for services that are not. The situation regarding demand for counseling is less clear – there is an association between rising incomes and demand for counseling but most of this is in contexts where private counseling is available. Also, AREVA will make available counseling services for workers and their families. Changing attitudes to education and changing aspirations can be expected to increase demand for high school and postsecondary training in Nunavut, and increase attendance rates.

As noted in earlier sections, most of any increased demand is expected to manifest earlier in the Project's operations phase, rather than continuously, as people settle in to lifestyle choices, including migration decisions and adaptations to wage employment and higher incomes. GN continues to respond to increasing demands, currently largely as a result of rapid population growth. However, there can be resource constraints and some stickiness in government response – it can take time to budget, design, approve, construct, staff and equip new infrastructure and even where new infrastructure is not needed, additional staff may need to be identified, recruited, housed and trained. Where increased demand cannot be immediately met on the part of government, there can be periods of stresses. For example, class size could need to be bigger and teachers and administrators busier until such time as new resources are can be in place.[57]

11.1.3 Policing

The demand for policing services increases with population growth, and with more public activity that is consequent on increased incomes. There is some evidence in some communities that timing of the need for police interventions can cluster at specific times, as a sort of peak load, which can stretch police forces on these occasions. There is also concern among the police that more serious drugs, and associated criminal activity, will become more common. Finally, specific to Baker Lake, policing is one area in which a large remote mine can have increased need for government services. Any emergency or crime at the mine site that requires police intervention can involve long travel times to

[57] Staff stresses have some potential to affect retention as well.

address. The Project mine site is far away from the hamlet, weather can intervene and the RCMP requires that two police officers attend a call.

As for social services and infrastructure, any capacity constraints to policing in individual communities five years and more from now are not predicted in detail. A major determinant of police capacity is the incidence of crime and in Kivalliq communities total crimes are rising, which cannot be attributed to the Project. The largest increases in demand for policing, associated with the Project, would be expected in Baker Lake and Rankin Inlet, as a result of some additional population growth. There is thus potential for increased policing costs, and again there may be some stickiness in responsiveness to increased demand, although recent inquiries to AREVA regarding expectations of required policing is indicative of RCMP attempts to plan well.

11.1.4 Housing

The big concern regarding housing in Nunavut would be increased demand for social housing and the capacity of GN to respond. Recent rapid population growth has had particularly negative effects on the availability and quality of housing, with consequent negative effects on wellbeing. Increased demand for private housing however is an economic driver, creating employment and other economic activity.

Additional demand will occur as a result of population growth, but also from employment. Demand as a result of employment arises where people have some measure of economic security. This is particularly true with regard to demand for private housing insofar as mortgage payments, unlike social housing rents, are not adjusted over time on the basis of ability to pay and represent savings through growing equity in houses. Construction work is often temporary and shorter term and may not provide the economic security, in a small economy, that allows people to choose to buy their own houses and most migration decisions are expected to be made at the time of operations.

Increased employment incomes have some potential to increase the demand for social housing, to the extent that newly employed workers feel more confident about their finances and wish to leave over crowded housing. In migration can also be expected to increase demand for social housing. Although Section 9 argues that most migrants are likely to be employed before making the decision to migrate, they will still need housing and most will at least initially likely seek out social housing. To the extent that demand increases, and cannot be met, overcrowding can result, although shortages of housing are in fact expected to be a constraint on migration.

In some alleviation of increased demand for social housing, some people are eventually expected to move into private housing. It is noted that this does not appear to have occurred in the NWT in response to the diamond mines. The cost of building in the north is very high and while mining incomes are generally higher than elsewhere in the

economy, they are not extravagant. In Baker Lake however, smaller and therefore less expensive houses are being built and finding a market including among the Inuit. People find rent increases for social housing onerous, and many people do aspire – once they have secure employment – to owning their own homes. In the larger communities of Baker Lake, Rankin Inlet and Arviat, there are established contractors who can achieve some economies of scale in building houses where demand is sufficiently high.

To the extent that new demand for social housing can be met, workers moving out of over-crowded housing will not alleviate the housing shortage, but will improve housing for family members remaining. There is potential for this type of effect in all communities supplying workers to the Project. Workers moving out of social into private housing will result in a release of social housing to others. This is considered most likely to occur in Baker Lake and Rankin Inlet where not only the Project but also others in the expanding economy will provide a market of sufficient size to encourage a more active private housing response. This is also considered possible in Arviat, although perhaps not to the same degree. Arviat's larger population and its response to employment opportunities at Meadowbank has meant that more than only a few people from the hamlet have found secure well paid employment in the mining sector.

11.1.5 Other Infrastructure and Services

The Project is not itself expected to place significant demand on municipal services, however it is considered likely that again in Baker lake and in Rankin Inlet, additional pressures will be begin to be seen, as a result of increased incomes (which increase demand for power and water for example) and as a result of population growth.

Both residents with increased incomes and employed in migrants are expected to be able to pay for any higher demands for services that are paid for. This does however leave the question of capital costs to supply new infrastructure and infrastructure expansion. In addition, there will be increased demands for community infrastructure and services that are not delivered on a cost recovery basis – examples would include recreational services and landfills for example.

For some other services, in growing economies there may be some potential for a private sector response – child care and some recreational activities might be examples.

11.1.6 Institutional Capacity and Governance

This section briefly addresses only the implications for effects on GN and hamlet governments' financial and human resource capacity to supply what are expected to be Project related increased demands for public infrastructure and services. (Section 10, Assessment of Effects on Individual, Family and Community Wellbeing, and references throughout this volume refer to capacity and governance in the sense of 'capacity

building', as this relates to, for example, providing more services in Inuktitut and engaging with the mining sector).

Hamlet governments are responsible to deliver municipal services and fund this activity to some degree through cost recovery, but primarily through transfers from the territorial government. As noted in the socio-economic baseline, GN has significant financial constraints in its ability to fund hamlets' needs and to provide the level and quality of other services that meet the needs of its population and are comparable to levels and quality of services elsewhere in Canada. Both hamlets and GN struggle to find capable staff to deliver services and any inflation in wage rates in response to shifts in the labour market will also affect budgets.

Increased demand for public infrastructure and services is a benefit to the extent that new demand can be met. However where it cannot be met not only are those with increased demand – those who are able to access economic opportunities – disappointed, but others may be crowded out of services as well. Not for all services, but for some, those able to access economic opportunities may have some options for recourse in the private market that either exists or develops to meet demand that can be paid for. Of more concern are people who needs may be higher but have reduced access. This could include, as examples, single women with young children, elders and the more unemployable.

With regard to financial resources, the Project is expected to pay significant royalties and taxes both the GN and NTI, which also provides wellbeing services to Inuit. In addition, increased economic activity generates revenues for government (see Section 13) and reduced dependence on social assistance frees up budget. It is perhaps conceivable that increased demand outstrips revenues generated by economic growth – expectations and aspirations can expand quickly. However, economic growth will provide the revenues for governments and NTI to maintain and improve current levels and quality of service.

In the above regard it is noted that in migration to Baker Lake and Rankin Inlet from other communities in Kivalliq, and in Nunavut, represents a redistribution of demand rather than an increase overall, although it is acknowledged that any smaller communities that lose population to migration will continue to expect the same levels of service. Also timing and predictability of expected revenues are factors, relative to demand.

With regard to human resources, there a number of positive linkages to the ability to supply public infrastructure and services on the part of hamlets as well as GN. These include expected increases in educational achievement and labour force capacity. For example, even where an individual can adapt to rotational work, this can eventually become less preferred, so some rotation between mining work and work in hamlets can

be expected, including of people who have become more qualified through mining experience.

The above is not to deny that shorter term disconnects will not occur. Baker Lake for example has struggled to find, and pay, municipal service workers in response to high employment levels at Meadowbank. As noted above, there can be some stickiness in response to increased demand.

11.1.7 Residual Effects

Table 11.-1-1 presents a summary of residual effects. Although wellbeing challenges are expected to decrease overall, this is not expected to result in any decrease in demand for health, and may not for counseling services. Rather, some increase in demand for health services can be expected. Effects will primarily be seen in Baker Lake and Rankin Inlet as these hamlets are where populations are expected to grow more rapidly as a result of the Project. Needs for social assistance will decrease, at least on a percentage of the population basis. The Project will be a contributing factor to increased demand for education across Kivalliq, and particularly in Baker Lake and Rankin Inlet as a result of population growth.

Attributing a direction (positive or negative) to an increased demand for public infrastructure and services is problematical. Insofar as demand can be met, there is a long term benefit for people. Where demand cannot be met there is not, particularly for the more vulnerable. The table indicates that the effect is expected to be positive over the long run, in the expectation that governments will be able to deliver. Effects on government budgets might be considered negative, as more costs are implied, however increased revenues are expected to more than fully enable government to meet its obligations to provide services in response to new demand.

All effects on demand are considered significant, insofar as they imply a need for government response and insofar as seamlessly accommodating supply and demand does not always happen. Disconnects in this expected accommodation have potential to negatively affect more vulnerable people, a significant effect.

Table 11.1-7 Summary Impact Matrix, Effects on Public Infrastructure and Services

Effect	Project Phase	Mitigation/ Enhancement	Direction	Magnitude	Geographic Extent	Duration	Significance	Likelihood	Prediction Confidence	Monitoring
Residual Project Effects, Public Infrastructure and Services										
Increase in demand for health services	Some potential for changes in demand during construction, but most will be seen during early years of operations	None practical	Positive	Medium	Communities, but primarily Baker Lake and Rankin Inlet	Long	Yes	Medium	Medium	Collaborative monitoring
Increase in demand for counseling services		On site counseling, EFAP	Positive	Negligible	Communities, but primarily Baker Lake and Rankin Inlet	Long	No	Medium	Medium	
Decrease in demand for social assistance		Work force management, life skills training	Positive	Medium	Communities	Long	Yes	High	High	
Increase in demand for policing		None practical	Positive	Medium	Communities, but primarily Baker Lake and Rankin Inlet	Long	Yes	High	High	
Increase in demand for private housing		None practical	Positive	Medium	Communities, but primarily Baker Lake and Rankin Inlet	Long	Yes	Medium	Medium	

Increase in demand for social housing		None practical	Positive	Medium	Communities, but primarily Baker Lake and Rankin Inlet	Long	Yes	Medium	Medium
Increased costs for governments		Payment of taxes and royalties	Negative	Medium	Communities	Long	No	High	High
Effects on increased demand for services on the more vulnerable		None practical	Negative	Medium	Communities	Medium	Yes	Medium	Medium

11.2 CUMULATIVE EFFECTS ANALYSIS FOR PUBLIC INFRASTRUCTURE AND SERVICES

As for other socio-economic effects, the expected rapid expansion of the mining sector could very well accelerate the effects discussed above on public infrastructure and services, as the same processes apply. Such cumulative effects are expected largely to be additive and would be significant as they are for Project residual effects. Irrespective of where the projects selected for the cumulative effects scenario are located, the competitive advantage of Baker Lake and Rankin Inlet will continue to mean that most effects are seen in these hamlets. It is arguable that at some point, populations in Baker Lake in particular could cross thresholds that would warrant not only an expansion of existing services, but the addition of services not seen before. This would be a cumulative benefit of significance.

11.3 SUMMARY OF EFFECTS ON PUBLIC INFRASTRUCTURE AND SERVICES

Increases in demand for all public infrastructure and services are expected, particularly in Baker Lake and Rankin Inlet. This will require a planning response of government. No climate change or transboundary effects are expected.

12 ASSESSMENT OF EFFECTS ON NONTRADITIONAL LAND USE AND LAND USE PLANNING

12.1 RESIDUAL AND CUMULATIVE PROJECT EFFECTS ASSESSMENT ON NON-TRADITIONAL LAND USE AND LAND USE PLANNING

Effects on traditional land use (harvesting) are addressed in Section 9. This section therefore considers potential Project effects on nontraditional land use and on land use planning, which in Nunavut considers both traditional and nontraditional land use, and more importantly, the interfaces between the two.

There are no expected Project effects on current nontraditional land use, outside the municipal boundaries of Baker Lake and the shipping channel into Baker Lake, largely because there is no such use of the lands proposed for development by the Project. The mine site does not overlap with other mineral leases. The access road options do transect prospecting permit and mineral claim lands but do not come close to other current exploration sites. The Project is outside the watersheds of the Thelon and Kazan rivers, the primary tourist attractions in western Kivalliq. With the single exception of the cable ferry for users of the all-weather access road (if built) to cross the Thelon, neither the Project nor any environmental effects will be observable to users of these rivers.

Current territorial and regional economic planning and strategy documents do not foresee that commercial harvesting will become an economic sector of importance in the near to mid-term future in Kivalliq.[58] In any case, the Project is not expected to have any significant environmental effects on resources that could have commercial harvesting value (caribou or fur bearing mammals as examples). Commercial harvesting is therefore not considered further.

[58] This refers to large scale commercial harvesting of fish and meat for southern markets. As noted in Section 9, Assessment of Effects on Traditional Culture, it is considered likely that there will be more commercialization of country food by individuals in Kivalliq over time.

However, there is some potential for the Project to be a stimulus to mining sector development in western Kivalliq, the cumulative effects of which could in turn have potential to affect development of tourism (and traditional land use as well) in this part of Kivalliq. So, whereas the Project does not infringe on existing land uses, there are relationships between the Project and what could happen in the future.

This section therefore considers potential effects of the Project on mining sector development, consequent effects on tourism (and inter alia on land use planning challenges that can be foreseen), as well as the potential for effects on Baker Lake.

12.1.1 Analytical Methods

The analysis of effects on nontraditional land use and land use planning is largely based on information from the NPC) and on the context for land use planning in the territory.

Land use planning in Nunavut remains a work in progress. In 2000, land use plans for two of the six planning regions in Nunavut – Keewatin and North Baffin (now Kivalliq and northern Qikiqtaaluk) – were approved (NPC, 2000). Subsequently, rather than complete additional regional plans, NPC determined to move forward with a single land use plan, or framework to guide land use, in Nunavut as a whole. An important part of the initial phase of developing a land use plan for Nunavut was documenting current land use.

NPC has prepared an interactive land use map, based on available data, consultant reports and community input, that identifies lands known to have – or can be expected to have – various uses, including for example, archeological sites, concentrations of wildlife, protected areas, general community interest areas, tourism, commercial fishing, and mining and oil and gas extraction. In addition, NPC has prepared a 'priority areas' map, that identified lands that are of particular environmental conservation interest (NPC, 2011).

There are overlaps in some of these areas, including potentially conflicting land uses. Extractive industry is not obviously compatible with wildlife breeding grounds or potential value to the tourism sector for example. NPC's expectation is that as land use planning advances beyond the data collection phase, and as projects come forward in the interim, complex issues will need to be discussed and resolved.

As noted above, Kivalliq has a land use plan. The plan does not come to conclusions on how any particular land area within Kivalliq is to be used, but continues to provide guidance to decisions on use. The plan foresees that mineral development would play an important role in the development of Kivalliq's economy, and took the position that this was acceptable provided environmental issues could be adequately addressed and that benefits would accrue to people in Kivalliq communities.

It is noted that the Kivalliq land use plan was being developed at the time of controversy over uranium mining – the plan acknowledges that at the time of its development the people of Baker Lake were opposed to uranium mining, but that they were continuing to evaluate the potential for impacts and benefits. The plan therefore did not exclude the possibility of uranium mining in the future, but expected that any new uranium mining proposal would be scrutinized carefully, including with full community participation.

In addition to the land use planning context in Nunavut and Kivalliq, AREVA's scenario for far future mining sector developments in western Kivalliq is used in the assessment that follows. This scenario includes three additional uranium mines within a 200 km radius of the Project (likely implying a bridge over the Thelon). This scenario is used to assess the Project's effects on mining sector land use.

With regard to land use in Baker Lake, the Project will involve building infrastructure in the hamlet – docking facilities and related access roads are on Crown land, outside municipal boundaries). However, any Project related economic stimulus can be expected to increase demand for both residential and industrial use land inside the hamlet and on the hamlet's shipping needs. Baker Lake does not have a land use plan, but has made available a map of land and buildings that has been referred to.

12.1.2 Mining

As the socio-economic baseline makes clear, there is high interest in developing the mining sector in Kivalliq, on the parts of mining companies, governments and at least some part of the region's people. One third of Kivalliq's 33 exploration projects in 2010 were for uranium, west of Baker Lake. The Project thus has the potential to affect land use for uranium mining through:

- the precedent it would set for uranium mining in Kivalliq
- infrastructure and processing plant capacity that under certain conditions could affect the economics of additional uranium mining projects west of Baker Lake
- capacity building of labour forces, businesses and educational institutions specific to uranium mining

Uranium mining remains controversial in Nunavut and in Kivalliq. As a result, at the time of writing, agencies of government are cooperating in policy review processes. The outcome of these processes is not yet clear – if, or under what conditions and limits, uranium mining will be permitted in Nunavut and/or in Kivalliq specifically is unknown. In parallel, AREVA is proceeding with the environmental approval process for the Project. Should the Project be approved, and should there remain openness to other uranium

mining at least in Kivalliq, this will be an encouragement to at least some other uranium mine developers.

It is noted that while many of the current exploration projects fall outside lands identified by NPC for alternative, in some cases incompatible, uses, there are other exploration projects located in the farther northwest corner of Kivalliq, on lands that overlap with a wildlife area of significant interest (WASI, in NPC terms) – the area is important habitat for the Beverly caribou herd with its nearby calving grounds. In addition, assessments of environmental effects and/or of cumulative effects of uranium projects may suggest that even where an individual project lies outside the WASI, its advance could set up a land use conflict, including with regard to traditional use. The Project's potential to increase the likelihood of more uranium mines west of Baker Lake may also therefore result in a need to resolve what NPC rightly refers to as complex issues, lending some urgency to the land use planning process.

The Project's infrastructure and transportation plans also have potential to facilitate exploration for uranium (or other mineral resources) and subsequently development of mines. It is foreseeable that any of the road options will provide some support to AREVA's ongoing explorations in western Kivalliq and/or could be used under negotiated conditions, or at least partly used, by other mining companies.[59] The Project's design for a 25 year processing plant life is based on an expectation of use, again by AREVA or others. Docking facilities may also be available to an alternative user. Any or all of these have some potential to make more cost effective additional projects, particularly uranium projects, west of Baker Lake.

On the other hand, AREVA's analysis is that their summer marine shipping requirements will bring use of the route from Chesterfield Inlet to Baker Lake to very close to full capacity at the narrows. As well, the expected economic stimulus to Baker Lake suggests that the hamlet's shipping requirements will increase over time. It may therefore prove necessary that any large development west of Baker Lake will need to build a road to bypass the narrows. Increased capital costs of road construction, as well as increased transportation costs, would represent increased costs to development.

Finally, with the advance of the Project to construction and operations, AREVA expects to invest in education, training and business development in Kivalliq. Much, although not all, of this will be specific to uranium mining – for example training in radiation

[59] AREVA's transportation plans are not yet fully developed. The highest base case number of vehicles, of 3,300 trips on a winter road open for a conservative estimate of 90 days is equal to about 2 trips per hour, less than capacity (see Section 2, Project Overview).

technology and uranium related health and safety. This will also affect the feasibility of new uranium projects in Kivalliq (and elsewhere in Nunavut) insofar as capacity to supply goods and services to the uranium mining sector from Kivalliq would increase.

Mining development costs in Nunavut are considered to be comparably high. With the exception of a transportation bottle neck that may be foreseeable on the shipping route into Baker Lake, the above factors all have potential to contribute to lowering costs for subsequent mining projects and can therefore be expected to increase the probability that at least some of the many ongoing exploration activities will advance.

12.1.3 Tourism

There are few tourists in Kivalliq, and fewer still who travel to the western parts of the region. Nevertheless, tourism remains an economic sector of some potential and is a particularly attractive option in Nunavut because of its coincidence with traditional culture. In community consultations related to planning for management of the Thelon and Kazan watersheds, GeoVector (2008) found that people valued environmental integrity here not only for reasons related to traditional culture but also because they felt tourism presented an economic opportunity. The Thelon and Kazan heritage rivers, and the Thelon Game Sanctuary, are arguably the major tourist attractions in western Kivalliq. Baker Lake, the closest community to the mouths of both rivers, is particularly well located to take advantage of the tourism potential in western Kivalliq. However, baseline information indicates that little of this potential is realized, beyond services provided to business travelers.

The Project is in neither watershed and is not expected to have significant biophysical effects (including on wildlife abundance) outside the immediate area of the mine site and access road options. The management plan for the Thelon River (NWTEDT, 1990) allows multiple use of a corridor along the river, subject to environmental and other necessary regulatory approvals. It is not considered likely that a cable ferry across the Thelon would be enough of a negative to discourage tourist use of the river. Although there could be some potential for the all-weather access road to facilitate outfitting, heavy vehicle mining traffic is not likely to make road transport for tourists in the north attractive. Nor is the mine site a tourist destination itself (although the NPC maps indicate that char fishing on the eastern side Judge Sissons is of interest to tourists). Thus the project is not expected to have effects on tourism as a result of its own activities. However, many of the uranium exploration projects referred to the section above are in the Thelon watershed.

As noted in the socio-economic baseline, in the absence of some confidence in markets, people in Kivalliq find little incentive to make the necessary investments to develop the outfitting business that would see returns to any increased tourism go to Kivalliq communities. GeoVector also considers that growing tourism in Baker Lake, as a complement to outfitting or not, would require development of community tourist

attractions (including opportunities to experience traditional culture), services and infrastructure. These in turn imply significant investment – in training, business development and physical plant.

In a context of aspirations to build a tourism sector, the Project may represent a disincentive insofar as it has potential to stimulate mining in areas of tourist interest. There are for example image effects – some tourists will find that other attractions in Nunavut or elsewhere in the north are preferable to travel through a uranium mining area. This again raises the possibility of land use conflict, with the added dimension of selecting uncertain future economic benefits (dependent on investment of funds that have not been identified) over more certain benefits. However it is noted that the land and resource characteristics that support tourism are essentially the same as those that support traditional use. Thus the issue will not be one of the compatibility of mining and tourism, but of mining and environmental conservation more broadly.

12.1.4 Baker Lake

Baker Lake's zoning map shows that, even taking into consideration building in the hamlet since the years since the map was prepared, there is ample room for increased building, both in areas designated residential and in areas designated as appropriate for commercial use, at least in the shorter term. Although Section 8, Assessment of Effects on Community Economies, foresees comparatively rapid growth in Baker Lake, it is expected that this would manifest over time rather than as an unmanageably large growth spurt. The land surrounding Baker Lake is Crown land, and therefore it is considered reasonable to expect that should conditions become crowded, municipal boundaries could be amended. It is noted in regard to land use in Baker Lake that the Project's motivating effects on additional uranium mining in Kivalliq will have additional land use effects in Baker Lake.

Of more importance is Project effects on available capacity to increase shipping over time into Baker Lake. AREVA's highest base case number of barge trips will bring shipping activity close to capacity, when considered in conjunction with Baker Lake and Agnico Eagle shipping over a shipping season conservatively estimated at 60 days. As for road transportation plans, it is not yet clear whether in fact this upward limit will be actual, or actual throughout the shipping season. As well, any lengthening of the shipping season with climate change would ease any evolving capacity constraints. Thus, it is not considered likely that capacity constraints would become unmanageable over the short to medium term. To the extent that such constraints may evolve in the longer term, AREVA will put in place transport plans to enable sufficient shipping to meet Baker Lake community needs.

12.1.5 Residual and Cumulative Effects

The primary effect of the Project on nontraditional land use in Kivalliq is expected to be some increase in uranium mining over what might have occurred in the absence of the Project. Such an effect is not inevitable. The expansion of both exploration and uranium mining will continue to be subject to Nunavut's land use planning decisions as these are taken over the coming years, as well as by environmental approval processes. On the assumption that more uranium mining is a desired outcome by the people of Kivalliq, the effect of the Project is positive, and significant, primarily in Kivalliq but potentially also elsewhere in Nunavut.

With regard to tourism, the eventual effect of discouraging tourism would be a cumulative one. The effect could be considered a negative one on the development of tourism. However, as noted above this would only occur if land use planning decisions favoured mining in western Kivalliq. The presumption is thus made that this is a choice that people and government in Nunavut, Kivalliq and certainly Baker Lake would have made. It is emphasized that the effect is largely one of forestalling future development of tourism rather than one of affecting current levels. Any potential positive effect of the Project on tourism, through added infrastructure for example, is considered to be negligible in this context.

Project effects in Baker Lake of the Project and associated migration and economic growth are likely to be increased demand for land for residential and business construction. The indications are that land is available and more could be made available over time, thus the effect may not be considered significant in the shorter term. However, to the extent that Baker Lake starts to grow faster than it is growing now, and to the extent that there are cumulative effects as a result of more mining projects, the effects could become significant. A land use plan may be a good initiative to guide planning not only of the layout of the community but also of service delivery.

A summary of residual effects on land use and land use planning is in Table 12.2-1. It is noted that there is much uncertainty as to both land use planning decisions that will be made in Nunavut and Kivalliq in the future and, if additional uranium mining is a desired outcome, the timing of any new uranium projects in western Kivalliq. Thus likelihood and prediction confidence are not often high.

12.2 SUMMARY OF EFFECTS ON NONTRADITIONAL LAND USE AND LAND USE PLANNING

The Project could be a stimulus to other mining sector activity that will raise complex issues needing resolution through land use planning in Nunavut. Land use planning will determine potential for effects of the Project on tourism, for example. No negative effects on land use and shipping into Baker Lake are expected. Although not attributable to the

Project, Nunavut's eventual land use planning decisions are expected to have some potential for transboundary effects into NWT in particular, given the importance people there give to the Thelon basin, as well as into provinces in southern Canada.

Table 12.2-1 Summary Impact Matrix, Effects on Non-Traditional Land Use and Land Use Planning

Effect	Project Phase	Mitigation/ Enhancement	Direction	Magnitude	Geographic Extent	Duration	Significance	Likelihood	Prediction Confidence	Monitoring
Residual Project Effects, Land Use and Planning										
Increase in uranium mining as a land use	Construction, operations	Openness to shared use of infrastructure, education and training initiatives	Positive	Medium	Kivalliq primarily	Long	Yes	Medium	Medium	AREVA will not monitor effects on land use in Kivalliq
	Final closure and post closure	Disposition of infrastructure		Medium		Long				
Disincentive to tourism as a result of expanded uranium mining	Operations	None	Negative	Medium	Baker Lake primarily	Long	Undetermined	Medium	Medium	
Development of tourism	Operations	Openness to shared use of infrastructure	Positive	Negligible	Baker Lake primarily	Long	No	Low	Medium	
Effects on land use in Baker Lake	Construction, operations	Planning assistance if requested	Positive	Medium	Baker Lake	Long	Yes	Medium	Low	Ongoing engagement, collaborative monitoring

Effects on shipping into Baker Lake	Construction	Iterative transportation planning	Negative	Negligible	Baker Lake	Medium	No	High	High	Ongoing engagement, collaborative monitoring
	Operations		Negative	Medium	Baler Lake		No	Medium	Medium	
Stimulus to complexity of land use planning	Construction, operations and final closure	None	n/a	Medium	Nunavut and Kivalliq	Long	Yes	Medium	High	AREVA will not monitor effects on land use planning in Kivalliq

13 ASSESSMENT OF EFFECTS ON THE ECONOMY OF NUNAVUT

13.1 RESIDUAL PROJECT EFFECTS ASSESSMENT ON THE ECONOMY OF NUNAVUT

The Project will have effects on the economy of Nunavut, through expenditures in the territory, job creation and revenues to GN and NTI. These effects will be seen as bumps, or swings, in economic indicators. This will happen as construction ramps up, and down, and then as production ramps up, remains approximately stable and ramps down at closure. As the socio-economic baseline's description of the experience of Meadowbank shows, these bumps can be quite large and have potential to introduce some volatility in Nunavut's economic performance.

13.1.1 Analytical Methods

To estimate the economic effects of the Project on Nunavut, other provinces and territories in Canada and on Canada as a whole, simulations for each of the construction and operations phases were run by Statistics Canada using their inter provincial input output model. The model estimates the direct, indirect and induced effects of economic shocks on gross domestic product, employment and labour income, and the distribution of these effects among industries and provinces.

The shocks used were a capital cost of $1,600 million on the 'construction industry'[60] and a production value of $885 million on the 'other metal ore mining industry'. These values derive from i) the Project's estimated construction costs[61]; and ii) for operations, the conservative (low) annual production rate of 3,200 tonnes uranium and an average price of U_3O_8 in 2007 of CDN $106.69. Shocks associated with other Project options have not been modeled, but are briefly addressed in Section 13.1.5, below.

[60] Terminology for industries discussed in this section is that used in the model. The model groups industries for purposes of characterizing production functions and has three levels of disaggregation. Where input data are sufficient, the highest level of disaggregation produces the most accurate results.

[61] The value of $1,600 million excludes contingency and is in 2007 dollars, as the most recent input output model is based on the economy in 2007.

There are some important limitations to input output models in general and Statistics Canada advises all users of model results that results should be interpreted cautiously (Statscan, 2009). Input output model development uses data on actual economic interactions to derive the coefficients that describe flows between different economic sectors and geographic areas. The small size and breadth of the economy in Nunavut mean that there are not sufficient data available as input variables for model development for many economic sectors. Further, there is a three lag in model development by Statistics Canada because it takes that long to develop the database to be used as the model input. So the results for Nunavut model runs are necessarily based on the structure of the Nunavut economy in 2007, which included no large mine construction and no operating mines. Thus for Nunavut in particular, extreme caution is warranted because:

- Model data for the construction sector reflect economic interactions characteristic of the construction of housing and community infrastructure that made up much of Nunavut's construction sector in 2007, a much more labour intensive activity than construction of large mines. Thus the coefficients do not well represent what the economic response would be to the construction of a project the size of the Project. One implication is that model can be expected to overstate effects on jobs and labour income.

- Nunavut had, in 2007, one small diamond mine operating and a large number of exploration projects ongoing. Again, the economic interactions for 2007 are not representative of those that might be expected as a result of the Project operations.[62] The difference between the economic interactions resulting from exploration and from large mine operations are large. Two model runs for Nunavut at different levels of disaggregation[63] produced results dramatically inconsistent with experience of the economic effects of large uranium mines.

The results for the construction phase model run were considered, in consultation with Statistics Canada, to be approximately correct. They are presented and cautiously interpreted in Section 13.1.2 below. However because the results for the operations

[62] This is particularly true insofar as more mines, and associated economic developments, are expected in the interim to 2021 when operations is scheduled to begin.

[63] It is possible to run the model at different levels of aggregation, provided input data are available. In the case of a uranium mine for example, the model can be run, in order of decreasing aggregation, for each of 'mining and oil and gas extraction', 'mining (except oil and gas extraction)' and 'other metal ore mining industry'. Because there was no 'other metal ore mining industry' in Nunavut for 2007, the model could only be run for the two higher levels of aggregation, by definition less accurate because the input data reflect activity quite different than that of uranium mining.

phase were considered to be so at odds with might realistically be expected,[64] a number of alternative model runs were done by Statistics Canada.

This necessarily involved running the model at different levels of disaggregation for jurisdictions outside Nunavut, specifically Saskatchewan and Ontario, as proxies for Nunavut. The Saskatchewan results were considered, again in consultation with Statistics Canada, to be the closest approximation Statistics Canada models could achieve for economic effects of the Project in Nunavut. This is of course because Saskatchewan has uranium mines, and only uranium mines, in the most disaggregated sector of 'other metal ore mining industry'. So the input data very accurately reflect economic interactions characteristic of uranium mines.

It is acknowledged that running the model for Saskatchewan introduces other difficulties with regard to the results, although these are considered to be much less significant than those introduced by running the model based on the only available (but inappropriate) input data for Nunavut. The two major difficulties are:

- Because Saskatchewan has only three uranium mining companies. Statistics Canada considers the results for direct effects confidential and has suppressed them. Running the Saskatchewan model at a less disaggregated level, for the 'mining (except oil and gas extraction) industry' provided some insight into direct effects, in some part addressing this difficulty.

- Saskatchewan as a proxy introduces some inaccuracy because Saskatchewan has a more mature uranium mining sector and a different cost environment than Nunavut. It was therefore expected that the Saskatchewan results would overestimate the economic effects as they would be seen in Nunavut. This is because with more capacity to supply uranium mines on the part of businesses in Saskatchewan, there is more potential for economic interactions inside the province that there would be inside Nunavut. Running the model at AREVA's most conservative production rate scenario in some part addresses this difficulty.

There are also additional limitations of the models, not specific to Nunavut. The price of uranium in 2007 was exceptionally high, double what it had been in previous years, what it was in subsequent years or is expected to be over the life cycle of the AREVA project. This does not affect the construction phase model run, does not have an effect on the results for direct employment and labour income, and has only small effect on indirect

[64] Direct employment effects were projected at ten times what is characteristic of uranium mining for example.

and induced employment and labour income, but it does have a very large effect on GDP.[65] For purposes of the presentation of the operations model results, GDP effects have therefore been recalculated at the price AREVA estimates will be paid for the Project product, $74 dollars per pound of U_3O_8, for purposes of presentation of results in Section 13.1.2 below.

Input output models do not address the ability of an economy to respond to rapid increases in economic activity. Shocks that are large relative to the size of an economy, as is the case for the Project, can strain limited resources. For example, the models estimate employment, but cannot differentiate between employment of residents as compared to imported labour. For both the construction and operations phases, the jobs and labour income will not all accrue to residents of Nunavut. The exit from Nunavut of labour income also means that induced effects for all economic parameters addressed in the model are likely overestimated because so little of the earned income of non-resident workers will be spent in Nunavut.

Because the model is based on coefficients that are fixed (in this case, as of 2007), it does not consider future adjustments in economic interactions, such as growing capacity in the labour force or increased efficiencies in production. Because construction will not begin for some years for example, growing capacity in the labour force that is expected to occur over this interim is not reflected in the results. Nor does the model capture externalities, such as environmental effects, which can have economic implications.

The limitations noted above, and other model limitations, have implications for both overestimation and underestimation. On balance while there is some tendency towards overestimation, this is compensated for by the use of conservative assumptions about construction costs, and operations production levels. Irrespective of model limitations, in contrast to the information on direct Project employment and expenditures provided in Section 8, Effects on Community Economies, the results of the model runs do provide a quantitative estimate of indirect and induced economic effects. The use of Statistics Canada's input output model also provides a common, replicable methodology for estimating economic effects in Nunavut that, if used to analyze other shocks to Nunavut's economy, permits comparisons between different projects.

The input output model includes results for taxation on production, a fiscal effect. In addition AREVA has estimated tax and royalty payments to each of the federal government, GN and NTI. Some additional fiscal effects, such as income taxes paid by

[65]. It is not possible to run models for specific years using alternative prices as all input data is based on actual prices.

direct Project labour and suppliers, have been very roughly and conservatively estimated but others, largely taxes on indirect and induced economic activity, cannot be estimated without making tenuous assumptions.

Annex A includes the full model run results for the construction phase and for the operations phase using Saskatchewan at the highest level of disaggregation, as a proxy for Nunavut. Summary results for five other model runs, some of which aid in the interpretation of the operations proxy run, are included in the appendix for comparison purposes.[66]

13.1.2 Economic Effects

Construction

Summary results for the construction phase are presented in Table 13.1-1. Annex A can be referred to for more information, for example on distribution of effects between industries and provinces.

The increase to Nunavut GDP would average over $160 million annually, in the order of 13% of GDP in 2010 (in 2010 dollars).[67] The percentage change in 2017 would be lower – the Conference Board of Canada (2010) expects real GDP growth of about 25% between 2010 and 2017, thus the effect would then be in the order of 10%. In 2017 then, GDP would increase (bump up) by about 10% relative to what it would be without the Project, and in subsequent years the Project would continue to account for about 10% (and less as the Nunavut economy continues to grow) of total GDP. It is noted that the Conference Board of Canada's projections of GDP growth take into account only Meadowbank and Meliadine. Construction and operations of mines have very large economic effects, thus if Mary River (and/or other mining projects) were to proceed, Nunavut's economy would grow more quickly than projected and the Project's percentage contribution to GDP would be smaller.

[66] The full results for Saskatchewan in the Annex are not completely consistent with the presentation of data in Section 13.1.2 as these latter have been adjusted for price expectations. The five model runs for which summary results are included are i) Nunavut at the level of mining and oil and gas extraction; ii) Nunavut at the level of mining (except oil and gas extraction; iii) Saskatchewan at the level of mining and oil and gas extraction; iv) Saskatchewan at the level of mining (except oil and gas extraction; and v) Ontario at the level of other metal ore mining industry.

[67] All results are presented in 2010, rather than 2007 dollars, as 2010 dollars are used in AREVA's Project costing and 2010 is the most recent year for which we have data on the Nunavut economy.

Table 13.1-1 Summary Input Output Model Results, Construction

	Total Effects (over 4 years)	Annual Effects		
	Nunavut	Nunavut	Rest of Canada	Total Canada
GDP, income based at basic prices ($ thousands)				
direct	485,877	121,469	0	121,469
indirect	102,915	25,729	184,900	210,629
induced	59,588	14,897	73,944	88,841
total	648,380	162,095	258,844	420,939
Full time equivalent jobs (no.)				
direct	2,442	611	0	611
indirect	1,197	299	1,859	2,158
induced	412	103	714	817
total	4,051	1,013	2,573	3,586
Labour income ($ thousands)				
direct	222,501	55,625	0	55,625
indirect	80,774	20,194	122,533	142,726
induced	36,896	9,224	42,350	51,574
total	340,171	85,043	164,883	249,926
Multipliers				
GDP	1.33	1.33	2.13	3.47
jobs	1.66	1.66	4.21	5.87
income	1.53	1.53	2.96	4.49
Taxes on products ($ thousands)				
federal	7,867	1,967	4,733	6,700
provincial/ territorial	4,423	1,106	6,557	7,663

Source: Statistics Canada input output model

Notes: All financial figures are in thousands of 2010 dollars. Annual effects are based on an even distribution over the construction phase. Multipliers show total effects as a function of direct effects – for example for every 3 direct jobs created there are an additional 2 indirect and induced jobs created.

In fact, construction expenditure is likely to vary, ramping up and then down over four years. Using the Conference Board of Canada's projections for GDP growth to 2020, and assuming a pattern of construction expenditures in the order of 15%, 30% 40% and 15% in 2017, 2018, 2019 and 2020 respectively, the Project's contribution would range between about 6% in 2017 and about 15% in 2019. This again assumes no other large projects proceed over this time period.

The model predicts an average of about 900[68] full time equivalent direct and indirect jobs annually over the construction phase, with another approximately 100 induced jobs. One thousand jobs represents employment equal to about 7% of Nunavut's labour force and 50% of the total number of unemployed in 2010. Considering that the labour force can be expected to grow much larger by 2017 and that not all jobs will be accessible by Nunavut residents, actual percentages will be quite a bit smaller.

If employment followed the expenditure scenario described above, the number of actual jobs would range between about 600 and 1,600 depending on the year. It is emphasized that the largest fraction of the direct and many indirect jobs are expected to be taken up by out of area workers rather than residents of Nunavut for the duration of the construction phase. This is also a relevant observation on the large increase in employment income – out of area workers will take home and spend employment income in their provinces and territories of residence. Induced jobs are more likely to be taken up by people in Nunavut as most of these jobs are in retail.

The model calculates taxes accruing to each of the federal and territorial governments only on production, for example from goods and service taxes (GST) and gas taxes. That is, the tax values in the table above do not reflect corporate income taxes or personal income taxes of the employed which will make up the bulk of fiscal effects (see Section 13.1.3 below). Nevertheless, on average, Nunavut's share of these production taxes represents about 1% of the territory's own generated tax revenues, which were $95.4 million in 2010.

Over 75% of GDP effects would be seen in the construction industry. Production is also estimated to increase by over $5 million annually in the industries of i) finance, insurance, real estate and renting and leasing; and ii) support activities for mining and oil and gas extraction. Production would also increase by over $2 million annually in i) retail trade; ii) municipal and territorial government services; and iii) professional, scientific and technical services. Many other industries would also see increased output.

[68] This approximates AREVA's conservative estimate of average construction employment levels of 750, which includes both direct and a portion of what the model considers indirect employment.

Over 60% of the 1,000 new jobs (and labour income) the model predicts annually would be in the construction industry and a further 10% in support activities for mining and oil and gas extraction. However the model also projects the creation of 25 jobs and more in each of the following industries, in order of magnitude: i) retail trade; ii) municipal and territorial government services; iii) finance, insurance, real estate and renting and leasing; iv) administrative and support services; and v) professional, scientific and technical services. Many other industries would see at least some job creation. About 98% of all jobs created are expected to be full time/full year.

Aside from effects in Nunavut, which will see about 39% of the Project's total GDP effects and almost 30% of jobs, the rest of Canada will see indirect and induced effects largely associated with necessary imports to build the Project. The biggest beneficiaries would be Alberta and Ontario, followed by Quebec and British Columbia.[69]

Although the rest of Canada, in total, will see a higher percentage of total Project effects than Nunavut will see, the economic effect is in fact very much smaller in percentage terms, given the comparatively large size of the Canadian economy.

Operations

Summary results for the operations phase are presented in Table 13.1-2 below. Model results are presented at the $107/lb U_3O_8 price to demonstrate the relative effects between Nunavut and the rest of Canada. Nunavut results are also presented as recalculated at a price of $74/lb, the price considered more representative of market conditions as they are expected to be post 2021. A comparison between the annual effects at each of the two prices also provides an indication of the sensitivity of GDP effects to U_3O_8 price changes – every $1 dollar change in the price of U_3O_8 produces an almost $10 million change in GDP.

[69] Saskatchewan will likely benefit more than the model indicates, given its capacity to supply the uranium industry, which is not reflected in the 'construction industry' model coefficients.

Table 13.1-2 Summary Input Output Model Results, Operations

	Total Effects (over 14 years)	Annual Effects			
	($74/lb)	($74/lb)	($107/lb)		
	Nunavut (Saskatchewan as proxy)	Nunavut (Saskatchewan as proxy)	Nunavut (Saskatchewan as proxy)	Rest of Canada	Canada
GDP, income based, basic prices ($ thousands)					
direct + indirect	6,820,731	487,195	789,749	92,456	882,205
induced	409,013	29,215	47,360	54,914	102,274
total	7,229,744	516,410	837,109	147,370	984,479
Full time equivalent jobs (no.)					
direct + indirect	25,900	1,850	1,850	855	2,705
induced	6,622	473	473	529	1,002
total	32,522	2,323	2,323	1,384	3,707
Labour income ($ thousands)					
direct + indirect	1,864,144	133,153	133,153	55,232	188,385
induced	356,530	25,466	25,466	31,452	56,919
total	2,220,674	158,620	158,620	86,684	245,304
Multipliers					
GDP	1.27	1.27	1.27	0.22	1.49
jobs	2.56	2.56	2.56	1.31	3.87
income	1.89	1.89	1.89	0.81	2.70
Taxes on products ($ thousands)					
federal	75,085	5,363	5,363	2,619	7,982
provincial/territorial	187,300	13,379	13,379	3,575	16,954

Source: Statistics Canada input output model

Notes: All financial figures are in thousands of 2010 dollars. Multipliers show total effects as a function of direct effects.

Comparison of Table 13.1-2 with Table 13.1-1 for the construction phase will show that operations effects are greater than the averages for construction on an annual basis, and because they will accumulate over 14 years, are much greater in total. Operations effects are also expected to be more consistent over time. AREVA expects to achieve a fairly constant production rate.

The increase to Nunavut GDP is over $500 million, in the order of 40% of GDP in 2010. The percentage change in 2021 would be lower – the Conference Board of Canada's estimate that GDP will grow about 28% between 2010 and 2020[70] means the contribution would then be in the order of something under 30% of GDP in 2021 (if no other large Projects are developed in the interim).

The model predicts an average of 1,850 full time equivalent direct and indirect jobs annually over the operations phase, with another approximately 470 induced jobs. This number is 17% of Nunavut's 2010 labour force and more than 100% higher than the total number of unemployed in 2010. Again, it is noted that by 2021, labour force characteristics are expected to be quite different than they were in 2010.

Reference to the results of the less disaggregated model run for Saskatchewan suggests that about half of these 1,850 jobs would be direct and half indirect. AREVA estimates that the Project will directly employ about 550 people during operations. Thus the estimate appears somewhat high, although AREVA's estimate is considered quite conservative. As for construction, the expectation is that many of these jobs will be taken up by out of area workers and much of the increase to labour income will also leave the territory. The multiplier effects on direct Project employment are much larger for operations than construction. As noted earlier, induced jobs are likely to be filled in much higher proportion by Inuit.

Over 80% of GDP effects would be seen in the mining industry, and output is also estimated to increase substantially in i) finance, insurance, real estate and renting and leasing; and ii) support activities for mining and oil and gas extraction. Many other industries would also see increased output.

Regarding job creation, about 30% of the over 2,000 new jobs (and associated labour income) the model estimates annually would be in the mining industry. The model also estimates the creation of jobs economy wide, including between 130 and 225 in each of the following industries, in order of magnitude, i) support activities for mining and oil and

[70] There are currently no projections beyond 2020 available.

gas extraction; ii) finance, insurance, real estate and renting and leasing; iii) retail trade; iv) administrative and support services; v) transportation; and vi) professional, scientific and technical services. Almost all other industries would see at least some job creation, and over 90% of jobs created would be full time/full year.

Aside from effects in Nunavut, which will see over 80% of total GDP effects and over 60% of jobs, the rest of Canada will see limited indirect and induced effects. The biggest beneficiaries according to the model would be first Alberta and then Ontario for GDP, and the order reversed for jobs. However Saskatchewan is certain to see benefits as well. Using Saskatchewan as a proxy means that benefits to Saskatchewan cannot be separated out.

The production taxes are inaccurate, as they are based on Saskatchewan tax rates which overall are higher than Nunavut's (for example gas tax rates are more than twice as high in Saskatchewan and the province has a provincial sales tax of 5% – these two taxes account for more than 99% of the total provincial production taxes in the table).

Other Economic Effects

The models do not predict effects on other macroeconomic indicators such as the personal savings rate, inflation rate, trade balance or business investment. Although no quantitative estimates have been done for such effects, some observations can be made.

Nunavut's savings rate is the highest in Canada, and is predicted by the Conference Board of Canada to remain above 30% (as compared to recent figures for Canada of about 4%) until 2020, as it has since 2000. It is noted that although Conference Board of Canada projections do take into account the effects of Meadowbank and the expected effects of Meliadine construction and operations, the projections do not vary over time by more than a single percentage point. Large projects are not expected to shock savings rates in Nunavut as they may do other macroeconomic indicators. GNDoF (2011) figures show that savings rates are not well correlated with either income or disposable income.

Savings rates are however better correlated with consumer expenditure patterns. Rising incomes and aspirational shifts could start to bring Nunavut's savings rates down. If for example, significant people moved into the private housing market, savings rate could fall – mortgage payments are counted as expenditures in savings rates calculations. A fall in the savings rate on this account might be considered a statistical artifact, insofar as for most people housing is one of the biggest investments they ever make. The savings rate in any case appears to be a poor indicator of economic health in Nunavut – much of what is saved currently is expected to be saved by non Inuit who do not invest in the territory but take their savings with them when they move. Also saving rate calculations depend on tracked financial transactions in the economy – for example, illicit

expenditures on drugs and alcohol are not tracked and will show up in the statistics as savings.

Nunavut's inflation rate broadly tracks that of Canada, insofar as so much of Nunavut's final domestic demand is in fact made up from imports from the rest of Canada. There is some potential for short term inflation in response to excess supply over demand, primarily for labour in Kivalliq communities, but this is not expected to result in significant effects at the level of the territorial economy. Again, reference can be made to Conference Board of Canada and GNDoF projections and history to establish that there has been so such effect in response to Meadowbank and none is expected in response to Meliadine.

Trade balances are a different matter, as large projects necessarily imply large imports of capital equipment and consumables during construction and of consumables during operations. Again, references to Nunavut's economic response to Meadowbank indicate that negative trade balance and business expenditures movements over the period 2007 to 2009 essentially followed the ramping up, peaking and ramping down of construction activity (Statscan, 2011). The Project will have a similar effect.

The Project's capital cost represents a very large business investment in Nunavut. AREVA's socio-economic management includes measures to assist businesses to increase their capacity to supply the Project. To the extent that these measures are successful, some Kivalliq businesses will need to spend capital to expand or diversify in order to successfully supply goods and services to the Project, representing additional business investment to that of AREVA.

13.1.3 Fiscal Effects

During construction, AREVA will not be producing uranium and will not be generating revenue. There will nevertheless be some small increase to GN revenues. In addition to over $1.1 million in taxes on production in the economy, employment as a result of direct, indirect and induced economic activity will generate personal income tax payments and payroll taxes will be paid on newly hired employees. Nunavut businesses contracted to supply the Project will pay corporate taxes. While none of these is necessarily large in its own right, cumulatively they are estimated to approach at least $2.5 million[71] annually, an increase to GN own source revenues in 2010 of over 2.5%.

[71] This would include $1.1 million in taxes on production, and – on direct jobs only -- about $1 million in payroll taxes.

During the operations phase, corporate taxes and royalties will be paid by AREVA. These are assessed on the basis of the value of output, which in turn depends on costs and revenues. Corporate taxes and royalties over the life of the Project will therefore be a function of:

- the production level in a given year, as this may be affected by operational considerations but also by interruptions of operations by weather, emergencies or other events
- the price paid for U_3O_8
- any future legislative or regulatory changes to the current basis used to assess corporate taxes and royalties, or to the distribution of royalties between the federal government and NTI

However, an approximate global amount for a 14 year operations phase can be estimated on the basis of a set of assumptions. The following assumptions derive from the Project's conservative assessment case, expectations of an average U_3O_8 price over the life of the Project, and the currently understood distribution of the uranium ore over Inuit owned and Crown land:

- 3,200 tonnes per year production level and a US $74/lb price for U_3O_8
- current corporate tax rates in Nunavut and Canada
- 35% of the uranium mined from Crown land, and the remaining 65% from NTI land
- for uranium on Crown land, annual royalties paid to the federal government, which remits 50% of the first $2 million and 5% of the remainder to NTI
- for uranium on NTI land, because the claim was held prior to the NCLA, royalties paid to the federal government, which remits the entire amount to NTI

The results are in Table 13.1-3. Payments to GN would average about $19 million per year, or about 20% of own source revenue in 2010 (although it is noted that actual payments in any one year could vary from this average). Payments to NTI are about the same. The federal government pays these into the Nunavut Trust, valued at the end of 2009 at about $1.1 billion (Nunavut Trust, 2010). Royalty payments would then represent in the order of 25% additional funding for the trust. NTI currently disburses in the order of $35 million annually on its programs for Inuit beneficiaries on the basis of trust investment returns – this also has potential to increase by 25%.

Table 13.1-3 Operations Phase Tax and Royalty Payments ($ million)

	Government of Canada	Government of Nunavut	NTI	Total
Corporate income tax	333	267		600
Royalties, Crown land	136		16	152
Royalties, NTI land			248	248
Total	**469**	**267**	**264**	**1,000**

Source: AREVA

As for the construction phase, there will be additional tax payments to GN, from personal and corporate income, payroll and production taxes in a total amount in the order of $2.5 million.

13.1.4 Final Closure and Post Closure

As noted in Section 8, Assessment of Effects on Community Economies, final closure is inherent in the non-renewable resource extraction industry. GNDoF (2010) notes the importance of encouraging the development of multiple mining projects in order to stabilize Nunavut's economy in face of inevitable closures. To the extent that other opportunities open up as the Project comes to its final closure will determine what actually happens in the economy – the final closure of the Project will result in economic contraction in the absence of new activity that takes its place.

Based on the current production plan, final closure is scheduled to begin in 2035 (the effects of finding additional reserves to extend the Project life are addressed in Section 13.1.5, below). As noted in Section 8, final closure and the subsequent post closure phase represent reductions, over the operations phase, in expenditures of over 85% and in employment over 90%, with consequent reductions in other economic parameters. Corporate tax and royalty payments to government and NTI will end. Large reductions in contracting and employment also imply that business and personal income tax receipts would be expected to decrease.

As noted in Section 6, Socio-Economic Management, AREVA will remain mindful of the potential for negative effects throughout the Project life cycle, integrating sustainable development principles into mitigation and benefit enhancement measures in an effort to minimize to the extent possible the negative socio-economic effects of closure on individuals. Enhanced capacity of the labour force and businesses, institutional strengthening of civil society, social investment and increased government revenues are expected to position people to achieve improved socio-economic status over the life of

the Project. This should have the result of improved capacity to absorb the effects of closure.

On the assumption that at least some other mining projects in Nunavut go forward and that the industry grows with time, Nunavut's economy can be expected to be, by 2035, much larger than it is today. Thus, although closure in fact reverses most of the Project's economic benefits, the relative contribution to economic performance should be lower than in the early years of the Project. Further, ongoing development in the mining sector may imply that there are other projects in the pipeline to replace the Project.

13.1.5 Assessment of Options

There is potential for the production rate to increase to 4,000 tonnes of uranium per year, which would increase the economic benefits described above for the operations phase in Table 13.1-2 by 25% on an annual basis and, if this production rate were sustained over the 14 year operations phase, total benefits would increase by 25% as well, including both economic and many of the larger fiscal effects.[72]

The extension of the Project operations phase from 14 to 25 years would not have a major effect on annual averages shown in Table 13.1-2, but would increase the total benefits as outlined by over 75%, or by more than double at a sustained production rate of 4,000 tonnes uranium per year. Any realized potential for increases to the conservative assumptions used to run the operations model would counteract any tendency to overestimation the run results represent. Most fiscal effects, both of an increase in the production rate and of an extension of the Project life, would also increase proportionately.

Other Project options could have implications for capital costs and for AREVA's operating costs and revenues, the latter of which would in turn have an effect on corporate tax and royalty payments. For example, the construction of the all-weather road would be an additional capital expense (with associated economic benefits and some effects on fiscal benefits during construction), but would also be built only if it decreased operating costs (implying increased fiscal benefits during operations). However, none of these other Project options are considered to have costs that would affect economic or fiscal benefits to the economy of Nunavut, except at the margin.

[72] Ramping up of the production rate is not expected to include a proportionate increase in employment for example. Some fiscal effects, from payroll and personal income taxes as examples, would not increase by a full 25%.

13.1.6 Residual Effects

A summary of residual economic and fiscal effects is in Table 13.1-4. Although it is emphasized that the quantitative results need to be considered with some caution, the margin of error would have to be extremely high to conclude anything other than that the Project will have significant positive economic effects. That is, confidence in the prediction of positive economic effects is high. Nationally and in the rest of Canada's provinces and territories, decimal place percentage increases in GDP and unemployment rates are analyzed for their importance. The Project's economic effects in Nunavut are so large in comparison, and will remain so for the life of the Project irrespective of what else happens in Nunavut's economy, that they must be considered significant.

Fiscal effects to GN and to NTI, particularly in an environment of substantial resource constraints and a policy priority of reducing dependence on federal transfers, are also positive and significant.

Table 13.1-4 Summary Impact Matrix

Effect	Project Phase	Mitigation/ Enhancement	Direction	Magnitude	Geographic Extent	Duration	Significance	Likelihood	Prediction Confidence	Monitoring
Residual Project Effects, Economy of Nunavut										
Contribution to GDP	Construction	None required, preferential employment and contracting, education and training and other Project socio-economic management measures are expected to maximize the retention of economic benefits in Nunavut	Positive	$162 m/year	Nunavut	Medium	Yes	High	High	Economic effects will not be monitored at the territorial or national level
	Operations			$500 m/year		Long				
Contribution to employment and labour income	Construction		Positive	1,000 jobs		Medium				
	Operations			2,000 jobs		Long				
Contribution to revenues of GN and NTI	Construction		Positive	$2.5 m/year		Medium				
	Operations			$20 m/year to each of GN and NTI		Long				
Reversal of economic effects in Nunavut	Final closure and post closure		Negative	High	Nunavut	Long				
Economic effects in the rest of Canada	Construction		Positive	Medium	Canada	Medium				
	Operations					Long				

13.2 CUMULATIVE EFFECTS ANALYSIS FOR THE ECONOMY OF NUNAVUT

Cumulative effects assessment generally considers reasonably foreseeable projects – projects that can be expected to advance to construction and operations. A project is defined as reasonably foreseeable for purposes of this subsection if it has initiated, or has publicly indicated an intention to initiate, an environmental approval process in Nunavut. In the case of socio-economic cumulative effects there are also other considerations – the socio-economic environment is not as static as the biophysical environment is often considered to be (barring climate change). Socio-economic conditions will be quite different in Nunavut into the future – the labour force is growing rapidly, educational achievement is likely improving, traditional culture and attitudes to wage employment are evolving, capacity to supply the mining industry is expanding and various changes to the ways that mining companies operate in the territory are being contemplated.

Only the largest of reasonably foreseeable projects are considered here, and they are all mining projects. Smaller projects, such as the Nanisivik Naval Facility and the Canada High Arctic Research Station, are excluded because their individual effects are dwarfed by those of the large mining projects (although it is noted that many smaller projects can together have important economic effects). The projects included are each large enough to alone have significant effects on the economy of Nunavut but in combination may suggest challenges and/or opportunities that are more than additive.

The assessment essentially is limited to the period extending through the decade of 2020s – there are no reasonably foreseeable projects expected to begin construction later than about 2017.

The approach is again through the building of a plausible scenario. This is most straightforward with respect to employment. Estimates of the employment levels of large projects during construction and operations can be arrived at on the basis of information publicly available from project proponents or can be approximated on the basis of available information on project size, expressed variously as expected capital costs, reserves and/or comparisons with similar projects.

Table 13.2-1 presents what may be considered a plausible scenario.[73]

Table 13.2-1 Cumulative Effects Scenario, Employment

	Construction			Operations		
	Employment	Start Date	End Date	Employment	Start Date	End Date
Meadowbank				800	2010	2019
Doris North Phase 1	300	2010	2012	200	2013	2015
Meliadine	1,200	2012	2015	850	2016	2025
Mary River	1,500	2013	2018	1,050	2019	2050
AREVA	750	2017	2020	550	2021	2035
Doris North Phase 2	1,000	2014	2015	700	2016	2032
Hackett River	1,500	2015	2018	900	2019	2035
Back River	1,000	2019	2021	750	2022	2029
Izok Lake	1,000	2015	2017	750	2018	2027

Sources:

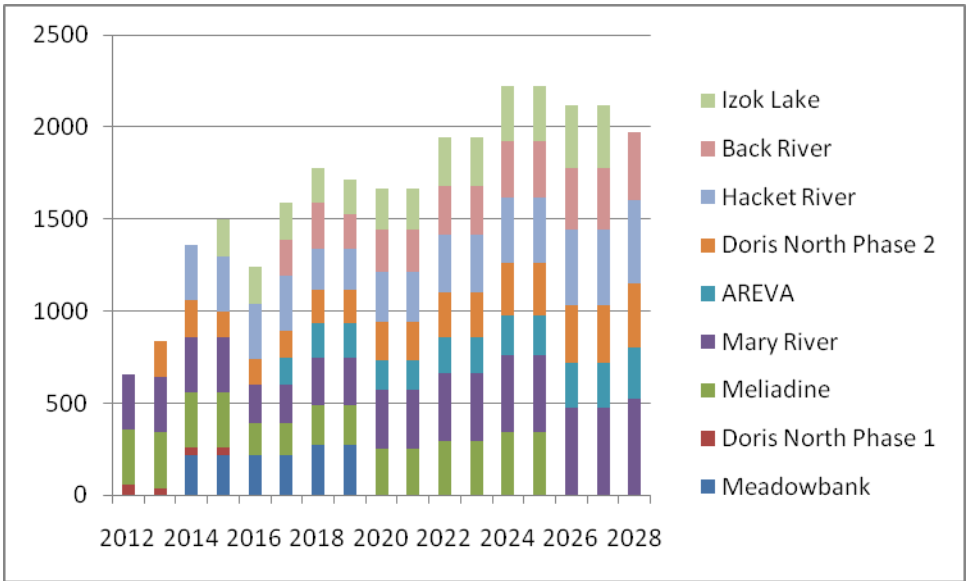
	Nunavut Mining Symposium presentations, 2011
	Kivalliq SEMC presentation, 2011
	Project application submitted to NIRB, 2011
	EISs (EIS figures are generally conservative, that is, are low estimates)
	Very approximate estimates based on available information

Plotting the approximate demand for Inuit labour for these Projects has the result presented in Figure 13.2-1. Inuit labour demand is calculated as a percentage of total

[73] It is noted that with time, the available information on large mining projects changes often, sometimes quite substantially. Some of the figures in Table 13.2-1 have been superseded by new data in the matter of months since the scenario was first constructed. Such changes are not considered to affect the broad conclusions of the assessment of cumulative employment effects however.

project employment, rising from 20% in 2012 to 50% in 2028 on assumptions of improved capacity to take up mining jobs over time. Although the graph does not show consistent growth year after year, the trend line is up between 2012 (when Meadowbank is in operation, Doris North is still in construction and Mary River hopes to begin construction) until 2025. The subsequent decline assumes no other mining projects advance in the interim.

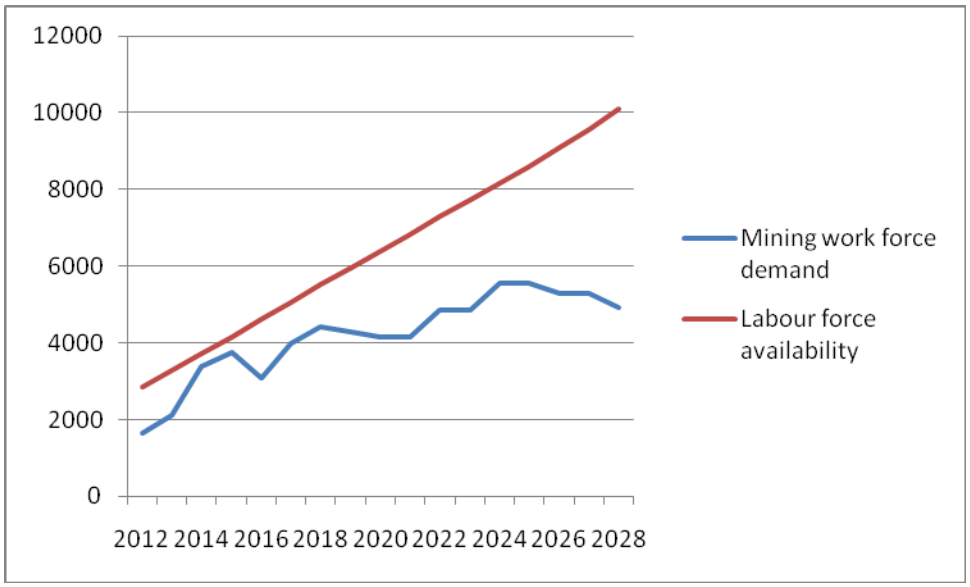
Figure 13.1-1 Demand for Inuit Labour



The figure shows only direct employment effects. Taking into account the multipliers in the tables in subsection 13.1.2, the total number of new jobs attributable to mining industry growth will be higher. For example, on an assumption that Inuit will take up 50% of indirect jobs and 100% of induced jobs in 2028 when all projects considered in that year are in their operations phase, total new employment would exceed 4,000 rather than the 2,000 shown in the figure.

In 2011 it might seem unlikely that 4,000 plus new employees could be identified to fill these jobs, recalling that the total number of unemployed in Nunavut in 2011 was just 2,400 people. However, expectations for labour force growth, calculated on the same basis as in Section 8.1 for community economies, indicate that for the foreseeable future, Nunavut will add between 400 and 500 people annually to its labour force as the high numbers of young grow up and look for work. The growth in jobs attributable to mining projects, including indirect and induced jobs, will not keep up with labour force growth in the longer term. This is demonstrated in Figure 13.2-2.

Figure 13.1-2 Labour Force and Demand for Labour



Note: Labour force availability in 2012 is based on unemployment in 2011 and new entrants to the labour force subsequently. Some new entrants will find employment other than mining related jobs, thus in effect the gap between the red and blue lines will not be as pronounced as shown. However the longer term implications are clear.

It is noted that the figure does indicate some potential for labour shortages in the period at least from 2013 to 2015. This would be of concern as it would indicate that more out of area employees will be needed to supplement the available Nunavut workforce. However delays against expectations, which might be considered characteristic of the mining industry, would push the blue line to the right, eliminating much of the apparent labour shortage in short term.

Different scenarios can be constructed on the basis of different assumptions of labour force growth rates, lower or higher direct Inuit employment rates by mining projects or a different constellation of projects for example. However unless assumptions were radically altered, scenario changes would not change the major conclusions, which are that:

- although in the shorter term, in 2013 to 2015, there is some potential for competition for labour, over the longer term labour demand will not exceed Nunavut's capacity to supply

- the mining industry currently holds out the most promise in creating the jobs that a rapidly growing workforce will need but currently foreseeable projects will not provide all the jobs Nunavut will need to create over the coming decades

- the capacity of labour to respond to mining industry workforce requirements is a critical component – with the exception of many induced jobs, skilled and productive workers will be needed to achieve and exceed the employment numbers presented in Figures 13.1-1 and 13.1-2.

- provided there are more than a very few mining projects in Nunavut, development of the industry can smooth out bumps in unemployment – as projects open and close, alternative employment opportunities are opened for retrenched employees.

Because economic systems are so integrated, employment can also be considered a sort of surrogate for other economic parameters characteristic of an industry. Although there will be many differences in detail, large mining projects will have roughly comparable relationships between work force requirements, capital expenditures, and revenues. Cumulative effects on GDP, labour income and revenues to government would approximate those developed for employment above – increasing over time and smoothing out the bumps in economic performance as compared to a scenario of occasional large projects. It is noted that as for labour, a growing capacity on the part of businesses to respond to mining projects goods and services will be an important component of cumulative economic effects.

AREVA's far future scenario, that of more mining projects (currently not foreseeable) in Kivalliq, cannot be assessed using the same means as above. However, it is clear from the above that there is, in the far future, both a capacity to provide labour to other developments in the mining sector and a need for mining projects in view of the eventual closure of foreseeable projects.

Territorial cumulative economic effects are significant benefits, and do not require either mitigation or monitoring by AREVA. It is noted however that government planning for enhancing capacity of labour and businesses and for sequencing of mining projects (particularly over the very short term when there may be more constraints to Inuit participation) can enhance cumulative benefits.

13.3 SUMMARY OF EFFECTS ON ECONOMY OF NUNAVUT

Project effects on the economy of Nunavut are significant benefits, from both economic and fiscal points of view. If climate change facilitates resource extraction in Nunavut, through reduced costs to the mining industry, the benefits discussed above would increase to the extent that Nunavut has capacity to access those benefits. Depending on the speed of any growth in the mining industry, the primary danger lies in leakage of economic effects outside Nunavut as workers and suppliers have to be sourced from elsewhere in Canada.

The Project will also have transboundary effects on the economy of Canada and its provinces although given the sizes of federal and provincial economies, such benefits are much smaller in percentage terms that they are in Nunavut.

14 SUMMARY OF RESIDUAL EFFECTS

14.1 RESIDUAL EFFECTS

14.1.1 Project Effects

Table 14.1-1 summarizes residual Project effects on the basis of a single conclusion for each of 26 VSECs assessed in Sections 8 to 13 above. It is fully acknowledged that the table does not capture the detail of effects on different individuals, genders, age groups, vulnerable groups and communities in Kivalliq, many of which can be negative in a context of overall benefit.

Further, many actual effects will depend on socio-economic conditions as these will be in Kivalliq in 2017 and beyond. In a rapidly changing socio-economic context, extrapolating current baseline trends can introduce substantial error. Further, the effects of the Project will be additional to those of Meliadine (for which there is no socio-economic assessment yet prepared), which is fully expected to be in construction, and perhaps operation, by the time the Project moves to construction.

Table 14.1-1 does not differentiate in terms of Project phase. Although there are some differences in detail, many of the processes are the same in both construction and operations and change in response to the Project will be continuous. Overall, as people adjust to change with time, most negative effects are expected to moderate and positive effects to gain momentum. At closure, the same processes may reverse, however in 2035, or 2046 with an extended Project life, the socio-economic conditions in Kivalliq will again be quite different.

Effects on community economies are positive and significant. The Project will preferentially employ, educate and train and contract in Kivalliq. Incomes will increase for many people and community economies will grow. Although the Project will come to an end, the life-long benefits of job experience and learning are not reversed.

Some migration is expected into Baker Lake and Rankin Inlet. This overall is a positive effect for individuals who choose to migrate and will stimulate additional economic growth in receiving communities.

Effects on traditional culture are overall expected to be negative and significant. The Project will not force or require changes to traditional culture of course – AREVA's mitigation measures are intended to support and facilitate people's choices. However

some drift away from harvesting, use of Inuktitut, and traditional values and knowledge must be expected, particularly in the context of other forces of cultural change. Climate change is also a factor.

Effects on individual, family and community wellbeing are overall expected to be positive and significant. Although negative effects on traditional culture have potential to erode wellbeing for some, broadening choices and opportunities for livelihoods are counteracting factors. There will be individual exceptions to improved wellbeing, and there is some expectation that crime, or awareness of crime, could increase in response to, for example, any developing inequities.

Increased demand for public infrastructure and services would be a negative effect if government were unable to meet that demand. Table 14.1-1 shows the effect as positive and significant. Revenues to GN and NTI will allow the provision of additional services, to the benefit of people. In this regard it is noted that the Project itself is not expected to a source of increased demand.

The Project is expected to stimulate interest and may facilitate in some respects additional mining, and uranium, projects, particularly in western Kivalliq. This is a benefit, and significant, insofar as the ongoing land use planning process determines that this is the path forward Nunavut and Kivalliq choose. The consequent negative effect on tourism is considered of low magnitude because of little current use of the area by tourists. Land use effects in Baker Lake (including use of the shipping channel) are considered highly manageable, and therefore not significant.

Economic and fiscal effects at the territorial level are positive and significant. There will be very large jumps in gross domestic product, employment, labour income, own source GN revenues and payments to NTI. Subsequently the Project will represent a sustained contribution to the economy and revenues until closure.

Table 14.1-1 Summary Impact Matrix

Valued Socio-Economic Component	Mitigation/ Enhancement Measures	Residual Effect	Direction	Residual Environmental Effects Characteristics					Significance	Likelihood	Prediction Confidence	Recommended Follow-up and Monitoring
				Magnitude	Geographic Extent	Duration	Frequency	Reversibility				
Effects on Community Economies												
Employment	Preferential hiring and contracting, education and training, work force management	Yes	Positive	High	Communities	Long	Continuous	In part	Yes	Very likely	High	Operations, collaborative monitoring
Education and training		Yes	Positive	High								
Contracting		Yes	Positive	High								
Economic growth and diversification		Yes	Positive	Medium								
Incomes		Yes	Positive	High								
Population change		Yes	Positive	Medium								
Effects on Traditional Culture												
Harvesting	Work force management measures	Yes	Positive/ negative	Medium	Communities	Long	Continuous	No	Yes	Very likely	Medium	Collaborative monitoring
Food security		Yes	Positive/ negative	Medium								
Language		Yes	Negative	Medium								

Values and knowledge		Yes	Negative	Medium								
Cultural heritage sites		No	n/a									
Effects on Individual, Family and Community Wellbeing												
Health	Work force management measures, contributions to communities	Yes	Positive	Medium	Communities	Long	Continuous	No	No	Likely	Medium	Collaborative monitoring
Family function		Yes	Positive	Medium								
Savings		Yes	Positive	Medium								
Public security		Yes	Negative	Medium								
Public health and safety		No	n/a									
Social cohesion and participation		Yes	Positive/ negative	Medium	Communities	Long	Continuous	No	Yes	Likely	Medium	
Effects on Public Infrastructure and Services												
Social infrastructure and services	None practical	Yes	Positive	Medium	Communities	Long	Continuous	No	Yes	Likely	Medium	Collaborative monitoring
Policing		Yes	Positive	Medium								
Housing		Yes	Positive	Medium								
Other infrastructure and services		Yes	Positive	Medium								

Institutional capacity and governance		Yes	Positive	Medium								
Effects on Non-Traditional Land Use and Land Use Planning												
Mining	None required	Yes	Positive	Medium	Nunavut and Kivalliq	Long	Continuous	No	Yes	Likely	Medium	None
Commercial harvesting		No	n/a									
Tourism		Yes	Negative	Low	Nunavut and Kivalliq	Long	Continuous	No	Yes	Likely	Medium	
Land Use in Baker Lake		No	n/a									Collaborative monitoring
Effects on the Economy of Nunavut												
Economic effects	None required	Yes	Positive	High	Nunavut	Long	Continuous	In part	Yes	Very likely	High	None
Fiscal effects		Yes	Positive	High								

14.2 CUMULATIVE EFFECTS

For purposes of assessing cumulative socio-economic effects, the scenario is the construction and operations of a total of nine large mining projects in Nunavut over the interim to 2028. The projects are Meadowbank, the Project, Meliadine, Mary River, Doris North phases 1 and 2, Hackett River, Izok Lake and Back River. Most of these projects are not in Kivalliq. However their very high demands for labour and goods, the imperative to maximize Project benefits to Inuit and rapidly growing capacity in Kivalliq to supply the mining sector suggest that there will be spillover effects into Kivalliq Region even where projects are located elsewhere in Nunavut.

These projects are expected to have the same types of socio-economic effects as the Project. Most of these effects will be additive, for example more people will be employed, economies will grow more quickly, there will be more demand for land in Baker Lake and crime levels may go up. However there is some potential that the total effects of all these projects together could be more, or less, than additive. That is, the combination of effects from multiple projects can result in a shift in the socio-economic environment to a state that adding up effects from multiple projects does not fully account for.

In the shorter term, should the combined demand for labour and goods outstrip capacity to supply simply on account of shortages of people in the labour force and should mining proponents then be forced to go south, benefits that notionally could have been retained by Inuit will not be. Nunavut's labour force is growing so quickly that this is not a longer term worry however.

The integrity of traditional culture will in the longer term depend on a substantial proportion of people maintaining its practice. The Project alone will not create economic opportunities for all, but any potential for much fuller employment, particularly of the young, may have long term negative implications for traditional culture. Government programs in support of traditional culture and ongoing importance given by people to maintaining cultural integrity will mitigate the potential for this to some extent, and Inuit do accept that culture evolves.

Rapid development of the mining sector has important implications for the interfaces between traditional and non-traditional land use, including for aspirations to develop a tourism sector. Land use planning in Nunavut has not advanced yet to the phase of delimiting areas appropriate for different uses.

Finally, the cumulative effects of multiple projects will be a significant benefit to the economy of Nunavut. Mining projects eventually close, with potential to cause severe economic and consequent social dislocation for both individuals and the territorial economy. The availability of new projects to take the place of older ones provides alternative jobs and markets for labour and business.

14.3 SOCIO-ECONOMIC MANAGEMENT

To manage socio-economic effects, AREVA has developed a Community Involvement Plan (see Technical Appendix 3C) and a Human Resource Development Plan (see Technical Appendix 9C). Project design has been adjusted, in response to community input, to protect environmental resources (and any consequences on harvesting) and to alleviate any fears associated with the storage of uranium in Baker Lake. Socio-economic management however is primarily effected through commitments to implement measures to mitigate the potential for negative effects and more importantly to enhance benefits for Inuit. Socio-economic management also includes extensive opportunities for community engagement and participation in Project decision making, and collaborative monitoring.

It is noted that AREVA's commitments as listed below are expected to be included in the IIBA negotiated with KIA. The measures are derived from lessons learned elsewhere in Nunavut and northern Canada, precedents set in earlier IIBAs, and people's suggestions during engagement. AREVA's corporate experience in Saskatchewan has also been drawn upon.

AREVA''s will maximize **employment and contracting opportunities** for people in Kivalliq communities. The major elements of this are i) preferential hiring, including points of hire in each of the Kivalliq communities; ii) preferential contracting, and helping businesses to overcome barriers to accessing Project contracting; iii) education, training and scholarship programs; iv) accommodating Inuit culture in the workplace as practical for improved job satisfaction; v) wide dissemination of information on available employment and business opportunities; and vi) requiring similar benefit enhancement on the part of contractors.

It is noted that **education and training** will include pre-employment, life skills, high school completion, postsecondary, on the job, and mentoring programs for workers and prospective workers. AREVA will also work with Kivalliq education authorities to implement school based programs for children, to contribute to their ability over the longer term to successfully participate in both wage and land based economic activity.

Work force management policies are largely intended to ensure that Inuit employees are equitably compensated, have opportunity to engage in traditional activity and are provided workplace conditions that accommodate Inuit culture. There is also the expectation that all workers will conduct themselves appropriately both at the mine site and when in communities. Workforce management measures emphasize; i) rotational work schedules to enable trips on the land in weeks off work; ii) worker codes of conduct (including expectations of respect for difference); and iii) facilitating, where appropriate, use of Inuktitut and traditional practices at the mine site.

AREVA's initiatives to support individual, family and community **wellbeing** include: i) providing a confidential employee and family assistance program; ii) staffing the mine site with peer and elder counselors; iii) providing staff in communities to facilitate the transition between work and home life; iv) providing communication systems for people to stay in touch with families; and v) supporting community initiatives to address community priorities towards enhanced wellbeing, including as examples, assistance to elder and child care and recreational opportunities for youth. .

Risks to worker and public health and safety are largely related to the Project land and marine transportation routes. Risks are managed through i) the application of best health and safety practice; ii) emergency response planning; and iii) avoiding and minimizing any environmental effects that have potential to affect livelihood resources and/or public health. Nevertheless heightened perception of risk is expected. This will be addressed through continuing education on uranium mining, and its environmental and socio-economic effects.

As throughout Project development, AREVA will continue to **engage**, including with elders to capture **IQ**, for input on socio-economic management measures and needed adjustments (adaptive management). AREVA will also continue to provide the information people need to engage and participate in the Project effectively. AREVA fully acknowledges the importance to conduct meetings and provide information not only in English but also in Inuktitut.

Monitoring with include reporting on the uptake of economic opportunities, but AREVA also expects to collaborate with communities, KIA, GN and AANDC to develop a framework for collaborative monitoring of community wellbeing, primarily through participation with the Kivalliq SEMC. Details remain to be worked out as the Project moves towards construction in 2017.

Closure (premature or final) effects are most keenly felt in the coming to an end of employment and business opportunities and the consequent negative social effects of an economic downturn. The measures described above include a number of elements that are intended to enhance economic and social resiliency in communities, which will go some way to attenuating the potential for negative closure effects. Work and business experience will give people a competitive edge in competing elsewhere in the economy. The emphasis on education and training will enhance work force and business capacity to offer services. As well, at closure retrenchment programs and alternative livelihood training will be offered where necessary.

It is noted that many of the residual effects described in Section 14.1 above are contributions of the Project to the ongoing socio-economic dynamic and trends in Kivalliq. As such, governments already have in place a large number of legal instruments and programs that have been developed to address the same kinds of socio-economic change, positive and negative, that has potential to result from the

Project. Examples include language preservation, support to traditional harvesting, expansion of postsecondary education and public health programs.

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16 GLOSSARY

Note: A glossary for terms general to this DEIS is in Volume ?. This includes, as examples, terms such as residual effect, sustainable development, access road and biodiversity. This glossary includes only those terms specific to this volume and defines terms in the ways they are used in this volume.

Adaptive management	Managing socio-economic effects in a way that recognizes that the socio-economic environment is always changing, and that changes need to be monitored so that mitigation and benefit enhancement measures can be adjusted over time to make sure that they are as effective as they can be.
Benefit	An effect that is positive
Coefficient	A number that comes from data collected on what has happened in the past in an economy, used in the input output model to calculate an estimate of what will happen in the future. The input output model has tens of thousands of coefficients.
Demography	Data on groups of people, with emphasis on things like births, deaths, migration, age and gender.
Direct effect or benefit	An economic term that includes effects that result from the Project's payments to workers and suppliers for example.
Disaggregation	The separation of a big grouping of economic activities, such as mining, into smaller groups such as gold mining, iron ore mining and uranium mining. Disaggregation for modelling produces more accurate results for a particular economic activity.

Economic shock	An economic event that is so large that it changes a whole economy in a major way. The construction of the Project is an economic shock because alone, it will change unemployment rates and the size of the economy by whole percentage points as opposed to fractions of a percentage point.
Externality	An economic term for things that are not addressed because it is really possible to assign a market dollar value. Input output models for example do not address environmental costs because there are no good data to use to describe the market value of, for example, an increase in dust in the air at some times.
Fiscal effect	An effect on government revenues or on government spending.
Final domestic demand	The total amount of money that is spent in an economy in a year, by government, businesses and people, including money spent on importing goods and services.
Government	Used as a general term to refer to all or most governing agencies at the hamlet, regional, territorial and national levels, including institutions of public government.
Gross domestic product	The total value of all goods and services produced within Nunavut, it in indicator of how big the economy is.
Indicator	A socio-economic characteristic that can be measured and so can be monitored to identify changes in a component of the socio-economic environment that is valued. The unemployment rate and the number of households speaking Inuktitut in the home are examples.
Indirect effect or benefit	An economic term that includes effects that result from the suppliers contracted by the Project in turn hire workers and buy from others what they need to fulfill their contracts with the Project.

Induced effect or benefit	An economic term that includes effects that result when income earned by workers and businesses supplying the Project is spent on things not related to the Project, such as new equipment for harvesting, new housing or better quality food.
Input output model	A mathematical model developed every year by Statistics Canada to estimate what will happen in an economy if a new economic activity starts.
Labour force	The total number of people (in a community, region or other area) that are either working or are looking for work.
Leakage	When used in a discussion of economic effects, the spending of money earned in Nunavut that is spent outside Nunavut, for example money spent on imported goods and services or money spent when a Nunavut resident is outside the territory.
Median	The number which identifies the data point for an indicator at which half the population has a lower value and half has a higher value. For example a median income of $30,000 means that half of households have less income than this and half have more.
Migration	Relocation of an individual or a household from one community (or province or territory) to another with the intent of living in the new community. People relocating out migrate from their old community and in migrate to the new one.
Offset	Something done to make up for something else done, so that nothing really changes. For example, if one mining project closes and lets people go the opening of another mining project, hiring those people, offsets the closing.
Primary data	Data collected by AREVA's socio-economic and IQ data collection team themselves, for purposes of this DEIS.

Qualitative data	Information that does not include a number, for example 'many people have moved into this hamlet recently' is qualitative data.
Quantitative data	Infromation that includes a number, for example '25 families have moved into this hamlet recently is quantitative data.
Royalties	Payments made by the Project to government, calculated on the basis of laws that set a percentage to be paid of the value of the output is defined as the market value of the uranium minus the costs of getting that uranium to the market.
Secondary data	Data obtained from documents that have been published, or come from the work of people other than AREVA's socio-economic and IQ data collection team, and used in thepreparation of this DEIS.
Threshold	The point at which an indicator value stops being manageable and becomes unmanageable. There are very few, if any, socio-economic indicator thresholds that people agree on.
Work force	The total number of people working for the Project, or for another project or activity.
Vulnerable	Word used to refer to people or households that because of economic or social challenges (poor health or education) or other factors (single parent, elderly) are more likely to be made worse off because of a Project negative effect, or are less likely to be able to take advantage of a Project benefit.

Attachment A

SELECTED INTERPROVINCIAL INPUT-OUTPUT MODEL RESULTS

Note: See excel files as listed below. AREVA CONSTRUCTION 1 to 4 files are the complete results for the construction phase in Nunavut. AREVA OPERATIONS 1 to 4 files are the complete results for the operations phase using Saskatchewan at the highest level of disaggregation, as a proxy for Nunavut. The other files are the summary results of model runs for Ontario, Saskatchewan and Nunavut, which demonstrate that the best approximation of potential economic effects of the Project are represented by the proxy run for Saskatchewan.

AREVA CONSTRUCTION 1

AREVA CONSTRUCTION 2

AREVA CONSTRUCTION 3

AREVA CONSTRUCTION 4

AREVA OPERATIONS 1

AREVA OPERATIONS 2

AREVA OPERATIONS 3

AREVA OPERATIONS 4

AREVA OPERATIONS NUNAVUT MEDIUM DISAGGREGATION

AREVA OPERATIONS NUNAVUT DETAIL DISAGGREGATION

AREVA OPERATIONS ONTARIO

AREVA OPERATIONS SASKATCHEWAN LOW DISAGGREGATION

AREVA OPERATIONS SASKATCHEWAN MEDIUM DISAGGREGATION