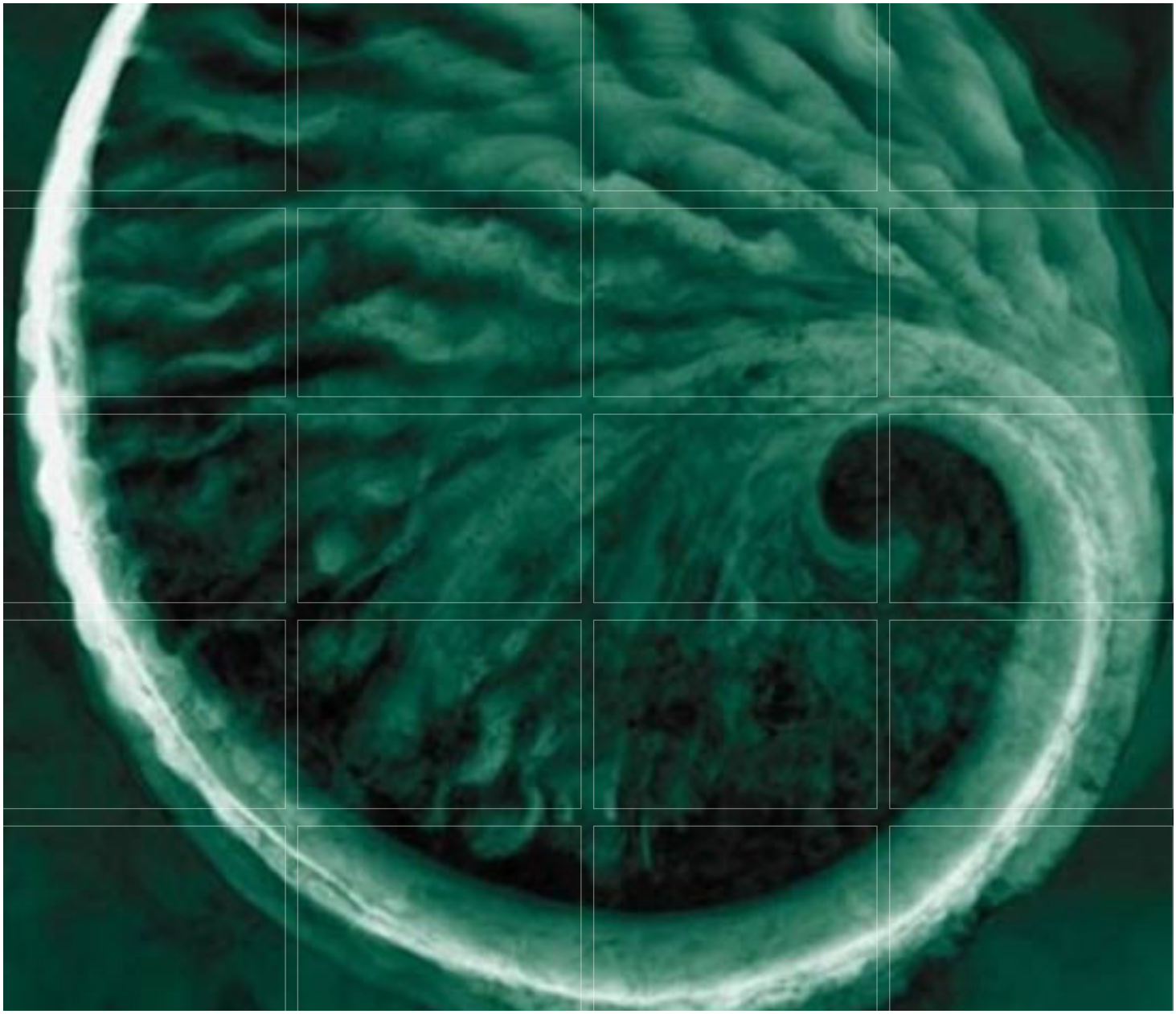
Appendix 23

Screening of Socio-economic Effects for Proposed Doris North Infrastructure Changes (ERM Rescan, April 2014)

MAC RESOURCES



Prepared for:

TMAC RESOURCES

DORIS NORTH PROJECT

Screening of Socio-economic Effects for Proposed Doris North Infrastructure Changes

April 2014

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TMAC Resources Inc.

DORIS NORTH PROJECT

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April 2014

Project #0236830-0002

Citation:
ERM Rescan. 2014. *Doris North Project: Screening of Socio-economic Effects for Proposed Doris North Infrastructure Changes.* Prepared for TMAC Resources Inc. by ERM Consultants Canada Ltd.: Vancouver, British Columbia.

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DORIS NORTH PROJECT

Screening of Socio-economic Effects for Proposed Doris North Infrastructure Changes

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1. INTRODUCTION

This memo focuses on screening of the potential socio-economic effects of the proposed changes to the Doris North Project (the Project).

With respect to the socio-economic effects of the Project, the activities/infrastructure addressed in this memo include:

- An initial mining rate of 1,000 tonnes per day (tpd; yearly average ore mining rate) with ore from these deposits processed by the existing mill at a rate of 800 tpd (yearly average). These rates may ultimately grade up to a mining rate of up to 2,000 tpd yearly average and a 1,800 tpd yearly milling average.
- Accessing the Doris subdeposits via the Doris North Portal, resulting in a two to four year extension of mine life.

The memo provides: 1) information on recent socio-economic baseline conditions and description on changes that have occurred since the 2005 Doris North Final EIS submission (Miramar 2005); 2) information on the expected direct employment and expenditures by the Project; 3) review of the 2005 Doris North Final EIS mitigation and effects assessment conclusions; and 4) a screening of the effects of the proposed changes in the Project in relation to the identified mitigation and effects assessment conclusions.

2. SOCIO-ECONOMIC BASELINE

A description of the socio-economic setting was included in the Doris North Final EIS (Miramar 2005). The following provides information on recent socio-economic baseline conditions and description on changes that have occurred since the 2005 Doris North Final EIS submission. Predominantly, this is related to updates from the 2006 and 2011 census and the 2011 National Household Survey (NHS)[1]. The use of 2011 NHS and census data provides an indication of changes and trends over time. The information provided in this report is focused on the Valued Socio-economic Components (VSECs) as presented in Miramar (2005).

2.1 EMPLOYMENT OPPORTUNITIES

According to the 2011 NHS, the potential labour force in the five Kitikmeot communities (excluding Bathurst Inlet and Omingmaktok) for the population over 15 years of age totalled approximately 3,925 people. The collective active labour force was approximately 2,410, indicating an average participation rate of 61.4%. This level of participation is lower than the Nunavut average of 63.4% and the Canadian average of 66.0% (Statistics Canada 2011b).

The participation rate ranged from 71% in Cambridge Bay to a low of 48% in Kugaaruk in 2011 (Table 2.1-1). The unemployment rate in all communities in 2011 was relatively high compared to the national average of 7.8% and it was also higher than the Nunavut average of 18%, except for Cambridge Bay, which reported an unemployment rate of 14%. Participation rates decreased from 2006 to 2011 by 10% in Kugaaruk and 6% Taloyoak, and increased by 4% in Kugluktuk; minimal changes were observed in the other communities. Unemployment rates increased from 2006 to 2011 in all communities with the exception of Taloyoak, where there was a slight decrease in unemployment.

Table 2.1-1. Participation and Unemployment Rates for Kitikmeot Communities, 2006 and 2011

	Participation Rate[1]		Unemployment Rate[2]	
Community	2006	2011	2006	2011
Cambridge Bay	71%	71%	10%	14%
Kugluktuk	60%	64%	22%	31%
Gjoa Haven	61%	59%	30%	34%
Taloyoak	58%	52%	28%	27%
Kugaaruk	58%	48%	21%	28%

[1]Participation rate is defined as the share of the potential labour force that is active.
[2]Unemployment rate is defined as the share of the active labour force that is unemployed.
Source: Statistics Canada (2007); NBS (2013a).

[1] Data from the 2011 NHS should be used with caution, particularly in making comparisons with 2006 or earlier census years because of a change in the survey methodology and reliability, with the primary concern being the response rates achieved and the representativeness of the data.

A portion of the non-Inuit population residing in the Kitikmeot Region have relocated from southern communities for the purpose of employment. However, the large majority of the population in the Kitikmeot communities are Inuit and this segment of the population is experiencing rapid growth, meaning that Inuit comprise the majority of the labour force. The labour force statistics of the Aboriginal identity population[2] in the Kitikmeot communities varies somewhat from those presented above for the total population. Understanding the employment circumstances of Inuit enables a better understanding of the resident labour force potentially available for future employment.

In all communities, participation is slightly lower and unemployment is slightly higher among the Aboriginal identify population (Table 2.1-2). Participation rates for males are generally higher as compared to females (from 4% higher in Kugaaruk to 10% higher in Cambridge Bay), as are unemployment rates, with the expectation of Taloyoak where the unemployment rate for females is slightly higher. Regionally, participation was higher for males (by 7%), employment was similar between males and females (1% difference), and unemployment was higher for males (by 6%).

Table 2.1-2. Participation and Unemployment Rates of the Aboriginal Identity Population in the Kitikmeot Communities, 2011

	Participation Rate[1]		Employment Rate		Unemployment Rate[3]	
	Total	M/F	Total	M/F	Total	M/F
Cambridge Bay	64%	69/59%	51%	53/51%	21%	25/15%
Kugluktuk	60%	64/57%	39%	41/38%	35%	35/33%
Gjoa Haven	57%	62/53%	36%	36/37%	36%	42/31%
Taloyoak	50%	54/46%	35%	39/32%	30%	29/32%
Kugaaruk	47%	48/44%	35%	31/39%	28%	35/18%

[1]*Participation rate is defined as the share of the potential labour force that is active.*
[2]*Employment rate is defined as the share of the active labour force that is employed.*
[3]*Unemployment rate is defined as the share of the active labour force that is unemployed.*
Source: Statistics Canada (2007); NBS (2013a).

Inuit are experiencing engagement in the wage economy to a greater extent than has been realized in the past. Employment rates in the region vary by community, from lows of 35 and 36% in Gjoa Haven, Taloyoak, and Kugaaruk to a high of 51% in Cambridge Bay. Unemployment rates were considerably higher in Gjoa Haven and Kugluktuk; 36% and 35%, respectively, representing relative increases from 2006 when the higher unemployment rates in the Kitikmeot were 32% and 31%, in Gjoa Haven and Taloyoak. In comparison, the unemployment rate for the Canadian Aboriginal population in 2011 was 15%.

This focused account of Aboriginal labour force characteristics shows greater balance in participation rates between the Kitikmeot, Kivalliq, and Baffin Regions (56.9%, 58.9%, and 55.8%, respectively). In terms of unemployment among the Aboriginal identity population, the Kitikmeot remains highest of

[2] Statistics Canada uses the term Aboriginal identity population to refer to all persons who reported identifying with at least one Aboriginal group, that is North American Indian, Métis, or Inuit, and/or those who reported being a Treaty Indian or a Registered Indian, as defined by the *Indian Act* of Canada.

the three regions (30%), while the Kivalliq and Baffin Regions (23%; 21%) more closely reflect the territorial average (23%).

2.2 EDUCATION AND TRAINING

In 2011, approximately 28% of the potential labour force in the Kitikmeot Region (i.e., those aged 15 years and over) had some form of post-secondary education (Statistics Canada 2011b). Amongst those aged 25 years and over, this proportion increased to 40%.

In general, high school completion rates remain low in all communities in 2011. A large majority of Kitikmeot residents aged 15 to 64 are without a high school certificate or diploma; namely three quarters of residents in Kugluktuk, Taloyoak, and Kugaaruk, over two-thirds of Gjoa Haven residents and almost half of Cambridge Bay residents (Table 2.2-1; Statistics Canada 2011b). Cambridge Bay residents had the highest level of educational attainment among the communities, with 36% of residents holding a postsecondary certificate, diploma, or degree. However, for all Kitikmeot communities high school incompletion is well above the Canadian average of 20% (Statistics Canada 2011b).

Table 2.2-1. Educational Attainment, 2006 and 2011

	Total Population Aged 15-64 Years									
	Cambridge Bay		Kugluktuk		Gjoa Haven		Taloyoak		Kugaaruk	
Level of Education	2006	2011	2006	2011	2006	2011	2006	2011	2006	2011
No certificate, diploma or degree	50%	49%	61%	76%	70%	67%	69%	76%	67%	76%
High school certificate or equivalent	11%	16%	8%	6%	7%	8%	5%	6%	4%	6%
Postsecondary certificate, diploma, or degree	40%	36%	30%	17%	22%	25%	26%	17%	31%	17%
• Apprenticeship or trades certificate or diploma	9%	9%	12%	15%	9%	10%	10%	8%	16%	12%
• College, CEGEP, or other non-university certificate or diploma	18%	13%	12%	3%	9%	11%	10%	6%	10%	3%
• University certificate or diploma below bachelor level	1%	3%	0%	0%	0%	0%	2%	0%	0%	0%
• University certificate or diploma at bachelor level or above	12%	12%	6%	2%	4%	4%	4%	3%	5%	2%

Source: Statistics Canada (2011b).
Note: Total may not sum as Statistics Canada employs a confidentiality procedure known as random rounding to prevent the possibility of associating statistics data with any identifiable individual (Statistics Canada 2011a).

The most common reasons for not finishing school reported by young Inuit men included that they wanted to work (18%), they were bored (18%), or they had to work (14%). The most commonly cited

reason by Inuit women for not finishing school was pregnancy/taking care of children (24%). Reasons were similar across Inuit regions (Statistics Canada 2008).

The low level of high school completion and pursuit of education continues to be a challenge in the region. Attendance rates of those enrolled in school can be low (e.g., 50 to 70%). In some communities there can be a number of individuals who have never gone to school (P. Cipriano, pers. comm.). Given the size of class cohorts in earlier grades (i.e., 20 to 25 students), the typical number of students graduating with a grade 12 education continues to be low – from approximately two to eight each year from each community (P. Cipriano, pers. comm.; G. Pizzo, pers. comm.). Similar challenges remain for attracting students to post-secondary education.

In the Kitikmeot Region, Cambridge Bay had a relatively high proportion of the population in 2011 with a university certificate or diploma (12%) compared with all the other communities. It also had the highest proportion of residents with a college degree or diploma (18%). However, attainment levels for apprenticeship and trade certifications were approximately equivalent across all communities and were slightly higher in Kugaaruk (Statistics Canada 2011b).

There were 21 secondary school graduates in the Kitikmeot in 2012. Table 2.2-2 shows there has been a higher number of graduates since 2008 as compared to earlier years. In 2012, there were 239 second school graduates in Nunavut. Of those, approximately half of the graduates were from the Baffin Region (124), and more than a third from the Kivalliq (94), while only a small number were from the Kitikmeot (21; NBS 2013e). Notably, while male graduation rates in Nunavut have often been somewhat lower compared to female graduation rates, there was much less gender variability in graduates in 2010/2011 (>1%) and 2011/2012 (2%).

Table 2.2-2. Secondary School Graduates in the Kitikmeot Region (2003 to 2011)

	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
Kitikmeot Region	12	11	17	21	16	35	23	30	24	21

Source: NBS (2013e).

Public school attendance in the Kitikmeot has declined slightly since reaching a high of 71% in 2005/2006 that was maintained until recently (Table 2.2-3). Of all Kitikmeot students, grades 9, 10 and 11 had the lowest attendance rates in 2010/2011 (60%, 54 % and 60%, respectively). Notably, students enrolled in grade 12 have higher than average attendance rates. Public school attendance was somewhat higher in the Baffin (70.3%) and Kivalliq (73.5%) regions comparatively (NBS 2013c).

Table 2.2-3. Public School Attendance Rate (%) 2003/2004 to 2010/2011

	2003/2004	2004/2005	2005/2006	2006/2007	2007/2008	2008/2009	2009/2010	2010/2011
Kitikmeot Region	70%	68%	71%	71%	71%	71%	69%	67%

Source: NBS (2013c)
Note: The Attendance rate is the percentage of total school days for which students attended school.

Similarly, across Nunavut, public school truancy rates in 2010/2011 were also highest in the Kitikmeot Region (25%) and have increased over the past three years. Truancy rates indicate the percentage of total school days for which a student has unexcused absences (NBS 2013d).

2.3 CONTRACT AND BUSINESS OPPORTUNITIES

As for the territory as a whole, the Government of Nunavut dominates the service sector and is the major economic driver of the local communities. This heavy dependency on the public sector is the result of circumstances such as a harsh climate, geographic remoteness, small population, and underdeveloped infrastructure systems that have led to constraints for private sector economic development in the territory.

Cambridge Bay is the largest and most diversified economy and is the business hub for the Kitikmeot Region, with an economy that is fairly balanced across the sectors (J. MacEachern, pers. comm.). Other communities have relatively few private sector businesses. These businesses mainly focus on providing essential services required by the community, which are not provided by government agencies, or on providing goods and services to government programs (e.g., housing). Businesses provide a wide range of services, including those that focus on goods and services to industry and the general public.

Many communities in the Kitikmeot Region do not maintain a registry of businesses. However, a central registry of Inuit-owned businesses is maintained by NTI (Table 2.3-1; NTI 2014). This excludes businesses that do not meet the criteria for being deemed Inuit-owned (e.g., the Northern Store). Further information on community business and services was obtained from field visits and interviews, as presented below. In addition, the Municipality of Cambridge Bay has provided a listing of businesses operating within the community (J. MacEachern, pers. comm.).

Table 2.3-1. Profile of Registered Inuit Firms in the Kitikmeot Region

Community	Type of Business	Number of Firms
Cambridge Bay	• Construction, contracting, and property management	6
	• Accommodation and housing	3
	• Retail	2
	• Air transportation	2
	• Medical, safety, and paramedical	2
	• Logistical services, expediting, and remote site management	4
	• Multiple services to mining sector	3
	• Mine development and training	1
	• Trade and services	2
	• Explosives	1
	• Catering, camp management, and janitorial services	2
	• Translation and language services	1
	• Lodge and guide outfitting	1

(continued)

Table 2.3-1. Profile of Registered Inuit Firms in the Kitikmeot Region (completed)

Community	Type of Business	Number of Firms
Kugluktuk	• Construction, contracting, and property management	3
	• Accommodation	1
	• Retail	2
	• Taxi	1
Gjoa Haven	• Construction, contracting, and property management	1
	• Accommodation	2
	• Retail	1
	• Consulting	1
	• Lodge and guide outfitting	1
Taloyoak	• Construction, contracting, and property management	2
	• Accommodation	2
	• Retail	1
	• Trade and service	1
	• Translation and language services	1
Kugaaruk	• Construction, contracting, and property management	1
	• Accommodation	1
	• Retail	1
	• Fish sales	1

Source: NTI (2014)

Because of the opportunities afforded by government spending on housing and infrastructure, each Kitikmeot community has at least one prominent firm providing construction services. These services can include housing and building construction, heavy equipment operation and excavation, road construction and maintenance, pad construction, and crushing to provide aggregate, as well as the rental of trucks, tools, and equipment (B. Schoenauer, pers. comm.). These businesses provide a relatively large number of private sector jobs, particularly during the summer construction season, and for smaller communities they typically provide the greatest number of jobs outside of government. The construction businesses include Kalvik Enterprises (Cambridge Bay), Kitnuna Projects (Cambridge Bay), Kikiak Contracting (Kugluktuk), CAP Enterprises (Gjoa Haven), Lyall's Construction (Taloyoak), and Koomiut Co-operative Association (Kugaaruk), among others. For example, in Taloyaok the largest private sector employer is Lyall's Construction, with approximately 20 local employees, followed distantly by the Co-op Store and the Northern Store (J. Oleekatalik, pers. comm.).

Co-operatives are a popular business model in Nunavut. Each Kitikmeot community has a co-operative (co-op) retail store that sells food, clothing, and a broad range of household items. With the exception of Kugaaruk, communities also have a competing Northern Store. Co-operatives operate the Inns North hotel chain and also hold a number of other contracts for providing services in the community. For example, in Kugaaruk, the Koomiut Co-op Association Ltd. operates the retail store and hotel; provides accommodation units for rent, heavy equipment services, construction services, and cable television systems; holds the POL (petroleum, oil, and lubricant)

service contract for the community; and is the agent for air service (First Air and Canadian North) and ATV and snowmobile sales (Yamaha and Polaris; L. Flynn, pers. comm.).

Mining service businesses have developed in Cambridge Bay, including medical and safety services, expediting and logistical services, site management, catering, and janitorial services (Tables 2.3-1 and 2.3-2). These companies have benefited from business opportunities associated with the Doris North exploration and construction activities, as well as other mining sector activities in the Kitikmeot Region. In total, there are approximately 100 businesses operating in Cambridge Bay (Table 2.3-2). The announcement of the new Canadian High Arctic Research Station (CHARS) in Cambridge Bay, which is to be operational by 2017 and have a staff of approximately 35 to 50 season, part-time, and full-time staff (Prime Mininster of Canada 2012) will bring additional business opportunities to the community (J. MacEachern, pers. comm.).

Table 2.3-2. Cambridge Bay Businesses

Type of Business	Description	Number of Firms
Consulting Services	• Engineering, environmental, business, management, human resources, language, and culture consulting services	9
Contracting and Mining Services	• Project management, property management, general contracting, construction, renovation, logistics, equipment rental, and mechanical, plumbing, heating, and electrical services	17
Expediting Services	• Expediting services focused on the mining industry	4
Financial, Legal, and Beneficiary	• Finance, banking, legal, insurance, accounting, and bookkeeping services	7
Food and Accommodations	• Hotel accommodations, rental accommodations, restaurant, and catering services	6
Janitorial Services and Supplies	• Cleaning and painting services, and janitorial supplies	4
Other Businesses and Services	• Wide variety of services, including import and export, daycare, dental, petroleum products, carpentry, and medical site services (among others).	13
Property Management	• Property management	7
Retail Sales and Rental Services	• General retail, gifts, art consulting and sales, motor vehicle sales, vehicle rental, retail sewing, meat and fish products, and pharmacy	18
Telecommunication Services	• Cable TV, internet, mobile phone, and telephone services	4
Tourism and Outfitters	• Guide services, sport hunting and fishing, sight-seeing, and other tourism services	11
Transportation Services	• Aviation, helicopter charter, shipping and barging, and taxi services	13

Note: individual businesses may appear in more than one category if providing multiple services.
Source: J. MacEachern, pers. comm.

In addition to Cambridge Bay, the mining sector has also had beneficial economic effects on other Kitikmeot communities, including Kugluktuk (because of the Diavik and EKATI operations in the

NWT) and Kugaaruk (because of local exploration activities of companies such as Diamonds North and Indicator Minerals; L. Flynn, pers. comm.).

In smaller communities, businesses and other organizations are involved in providing a wide range of services and providing services outside of their core client group. This is necessarily as a result of servicing relatively small, isolated populations that cannot support a large number of businesses. For example, it is not uncommon for housing associations, which are primarily responsible for the management and maintenance of public housing for the Nunavut Housing Corporation, to contract out maintenance services outside of public housing on an as-required basis (i.e., accept work orders from private home owners; G. Dinney, pers. comm.; H. Tungilik, pers. comm.). Because of the on-hand inventory and ability to source building supplies, private home owners may also purchase construction materials directly from housing associations, which effectively operate as local building supply stores.

2.4 COMMUNITY HEALTH

2.4.1 Health Status

Self-reported health status, data that are collected through the national census, provides an overall measure of health. The results for the Kitikmeot Region are shown in Table 2.4-1. Results are fairly consistent across communities, with 43 to 50% of residents reporting excellent or very good health, 33 to 39% reporting good health, and 11 to 19% reporting fair or poor health. These Kitikmeot community self-rated health status scores are comparable or similar to the Canadian average of 56% excellent or very good, 27% good, and 17% fair or poor (Statistics Canada 2008).

Table 2.4-1. Self-rated Health Status, 2006

	Proportion of Population (% 15 Years and Over)		
Community	Excellent or Very Good	Good	Fair or Poor
Cambridge Bay	43%	38%	19%
Kugluktuk	45%	39%	16%
Gjoa Haven	49%	33%	16%
Taloyoak	43%	39%	16%
Kugaaruk	50%	37%	11%

Note: values for Taloyaok and Kugaaruk are estimated.
Source: Statistics Canada (2008).

Census information also asks individuals to self-report on chronic conditions (Table 2.4-2). The prevalence of chronic conditions in the Kitikmeot are indicated to be generally at the same level as in Canada overall. Cardiovascular problems tended to be higher in Taloyoak than in any other community. For the two communities for which data on chronic communicable disease were available, the rate of incidence was higher than the Canadian average, while the incidence of arthritis and rheumatism are less common in Kitikmeot communities than in Canada overall (Statistics Canada 2008). This is not unexpected given the much younger population in the Kitikmeot.

Table 2.4-2. Prevalence of Selected Chronic Conditions, 2006

Community	Proportion of Population (% 15 years and over)				
	Arthritis or Rheumatism	Digestive Problems	Respiratory Problems	Cardiovascular Problems	Communicable Disease
Cambridge Bay	20%	10%	11%	18%	8%
Kugluktuk	10%	9%	7%	15%	7%
Gjoa Haven	13%	11%	11%	21%	n/a
Taloyoak	12%	12%	n/a	27%	n/a
Kugaaruk	13%	11%	11%	21%	n/a

Notes: n/a = data not available. Communicable diseases include Hepatitis, Tuberculosis, or HIV/AIDS.
Source: Statistics Canada (2008).

In addition to the above overall indicators of health status, there are a number of individual statistics that stand out as distinct for Nunavummiut as compared to the Canadian population as a whole. This includes a lower life expectancy, a higher infant mortality rate, a higher incident of low birth weight, higher smoking rates, higher rates of infant respiratory tract infections, higher rate of tuberculosis, and high rates of sexually transmitted infections (STIs) such as chlamydia and gonorrhoea (NTI 2008).

2.4.2 Health Care Utilization

The level of health care utilization is also an indicator of overall health because it is a measure of the extent to which the population seeks health care services. Community health centre utilization statistics for the Kitikmeot Region are shown in Table 2.4-3.

Table 2.4-3. Community Health Centre Utilization, 2011/2012

	Total Visits to Health Centre	Visits to Sick Clinic	Visits for Prenatal Care	Well Clinic Visits	Chronic Disease Visits	Medevac Transports
Cambridge Bay	7,179	5,880	363	203	394	78
Kugluktuk	6,382	5,321	276	221	149	78
Gjoa Haven	5,423	3,994	307	60	285	76
Taloyoak	5,838	4,879	169	36	43	57
Kugaaruk	4,225	2,786	280	61	43	36
Total	29,047	22,860	1,395	581	914	325

Source: Evalik (2012).

The vast majority of visits are for primary care due to illness or injury. Other health centre utilization categories, shown in Table 2.4-3, are associated with public health programs. Of these, the most heavily utilized is the chronic disease program. It is also noteworthy that the number of visits for the Well Man Program is extremely low compared to participation in Well Woman and Well Child. In general, men are more reluctant to access the health services that are available to them (C. Evalik, pers. comm.).

Within each community in the Kitikmeot at least one social worker is employed who provides child and family services, child and adult protection, crisis intervention, and family counselling services

(Rescan 2013). In 2012, there were a number of children in foster care in regional communities and also outside the territory (Table 2.4-4). Children and adults who require residential care (e.g., people who have behaviour issues, disabilities, or are incarcerated) are relocated outside the territory, as this level of care is not available in Kitikmeot communities. Of approximately 38 children in care, 15 children were in care outside the territory. Additionally, there were 39 adults in care outside the territory in September 2012 (Table 2.4-4; Evalik 2012).

Table 2.4-4. Individuals in Care (September 2012)

	Cambridge Bay	Kugluktuk	Gjoa Haven	Taloyoak	Kugaaruk	Region Total
Children in Care	27	6	4	4	0	38
Children in Care Outside Territory	4	6	4	1	0	15
Adults in Care Outside Territory	6	12	13	2	6	39

Source: Evalik (2012).

Each community in the Kitikmeot Region employs an individual responsible for home care who provides support to the elderly, disabled, and people recovering from major surgery. As shown in Table 2.4-5, community health profiles indicate there were approximately 113 people receiving home care and seven people receiving palliative care in the Kitikmeot communities in 2012 (Evalik 2012).

Table 2.4-5. Home Care Patients in Kitikmeot Communities (2012)

	Cambridge Bay	Kugluktuk	Gjoa Haven	Taloyoak	Kugaaruk	Region Total
Patients in Home Care	28	30	21	15	19	113
Palliative Patients	0	5	1	0	1	7

Source: Evalik (2012).

The proportion of the population accessing heath care professionals varies and may be an indicator of overall levels of access to health care services. Table 2.4-6 provides a summary of access to health and other services within a 12 month period in 2006. Visits to a nurse occurred for a substantial proportion of the population, being highest in the smallest communities of Taloyoak and Kugaaruk. Access to the specialized care of a doctor or dentist or orthodontist occurred much less frequently (Rescan 2013).

Table 2.4-6. Access to Health Care Providers in the Last 12 Months, 2006

	Proportion of Population (% 15 years and over)			
Community	Doctor	Nurse	Dentist / Orthodontist	Other Health Professional
Cambridge Bay	44%	67%	41%	52%
Kugluktuk	40%	72%	48%	45%
Gjoa Haven	29%	71%	49%	52%
Taloyoak	39%	80%	51%	43%
Kugaaruk	37%	84%	58%	50%

Source: Statistics Canada (2008).

Notably, in all communities, diseases of the respiratory system accounted for the largest specified portion of health center visits in 2012 and over the past decade (NBS 2014).

2.4.3 Suicide

Suicide has been a prominent social issue in Nunavut communities. The extent to which death by suicide has occurred and the degree of suicide-related trauma is far greater than that experienced by many other jurisdictions (Government of Nunavut et al. 2010). For example, in 2009 across Nunavut the RCMP reportedly responded to a total of 983 calls where persons were threatening to or attempting suicide (Government of Nunavut et al. 2010). Nunavut-wide rates of suicide ideation (thoughts of committing suicide) and suicide attempts are shown in Table 2.4-7.

Table 2.4-7. Nunavut-wide Rates of Suicide Ideation and Attempts

Suicide Ideation (within past week)	Share of Respondents (%)	Suicide Attempt (within last six months)	Share of Respondents (%)
None	56.4%	Never	70%
Sometimes	40.0%	Once	14%
Very often	2.6%	Several	13%
All the time	0.0%	Many	3%

Source: Haggarty et al. (2008)

The total number of suicides in Kitikmeot communities is shown in Table 2.4-8. The rate has been particularly high in Kugluktuk (average annual rate of 190) followed distantly by the other communities, with Gjoa Haven the lowest at an annual average rate of 52 (per 100,000 population). Young Inuit men typically make up the largest proportion of these deaths (Government of Nunavut et al. 2010). On January 16, 2014, Nunavut's chief coroner called a public inquest into suicide in the territory following 45 deaths by suicide in 2013, Nunavut's worst year since it became a territory in 1999. As of January 16, 2014, there had been three deaths by suicide among Nunavummiut (Nunatsiaq 2014a).

Table 2.4-8. Suicides in Kitikmeot Communities, 1999-2008

Community	Total Number of Suicides	Average Annual Rate (per 100,000 population)
Kugluktuk	22	190
Cambridge Bay	7	65
Gjoa Haven	5	52
Kugaaruk	5	80
Taloyoak	5	70

Source: Hicks (2009).

The high suicide rates in Nunavut have been attributed to the rapid social change that has occurred and the sense of discontinuity and loss of self-reliance that this has caused. Governments are undertaking initiatives to improve mental wellness and address some of the causes of social discontinuity at the community level. Factors that have been identified to reduce the likelihood that

an individual will consider suicide include having a stable home life, being educated, being employed, and the receipt of mental health care as required (Government of Nunavut et al. 2010).

2.5 HOUSING DEMAND

According to the Nunavut Housing Needs Survey (2009/2010), the most common type of housing is the Kitikmeot communities is classified as public housing, representing three quarters of the housing stock in Gjoa Haven and Taloyoak, two-thirds in Kugaaruk and Kugluktuk, about half in Cambridge Bay. The second most common type of housing was privately owned housing, followed by staff housing and other types of rented housing (Statistics Canada 2010a). Public housing units are subsidized rented dwellings under the Nunavut Housing Corporation (NHC) and are available to Nunavummiut who meet certain eligibility requirements. Private market rental units are owned by private individuals, corporations, or other organizations and are made available on the rental market (Nunavut Bureau of Statistics 2011).

The availability of suitable housing is an important issue for all Kitikmeot communities. Overcrowded housing is considered to have health and other implications including, for example, violence, depression, stress, and a higher incidence of infectious diseases (Inuit Tapiriit Kanatami 2007; NTI 2008). A large number of dwellings in the Kitikmeot Region are crowded according to the National Occupancy Standard (Table 2.5-1). These rates are slightly higher than in Nunavut as a whole, where approximately 35% of dwellings are overcrowded.

Table 2.5-1. Dwellings Occupied by Usual Residents Classified as Crowded (2009/2010)

	Crowded Dwellings		Crowded Dwellings Regularly Using the Living Room as a Sleeping Area	
Community	Number	Proportion of Total	Number	Proportion of Total
Cambridge Bay	170	35%	80[E]	17%
Kugluktuk	130	34%	50	13%
Gjoa Haven	130	57%	70	30%
Taloyoak	100	56%	50	28%
Kugaaruk	70	50%	30	20%
Kitikmeot Region	610	43%	280	20%
Nunavut	**2,930**	**35%**	**1,470**	**18%**

Note: a dwelling is classified as crowded if there is a shortfall of bedrooms based on the National Occupancy Standard.
[E] = estimated.
Source: NBS (2011).

Overcrowding is particularly prevalent in the eastern Kitikmeot communities of Taloyoak, Gjoa Haven, and Kugaaruk, affecting the majority of homes. In the western Kitikmeot, overcrowding is experienced in approximately one-third of homes (Kugluktuk, 34%; Cambridge Bay, 35%).

Recent census data further highlights overcrowded conditions in the Kitikmeot communities. In the eastern Kitikmeot communities of Gjoa Haven, Taloyoak, and Kugaaruk, more than 50% of households have four or more persons per home and approximately 20% are two-or-more family

households. Notably, almost half of the homes in Kugaaruk (42%) and over one third of homes Gjoa Haven (36%) provide accommodation for six or more people (Table 2.5-2; Statistics Canada 2012).

According to the Nunavut Housing Needs Survey, in addition to overcrowded conditions, over a quarter (27%) of the Kitikmeot housing stock required major repairs for items such as defective plumbing or defective electrical wiring, leaking oil or sewage tanks, or a broken hot water heater (NBS 2010).

As noted earlier, public housing is the most common type of housing tenure in the region. Table 2.5-3 shows a comparatively lower amount of public housing (49%) in Cambridge Bay which is linked to higher than average privately owned and staff housing within the community. Cambridge Bay serves as the regions service hub. Prevalence of owner-occupied dwellings ranges from approximately 13% in Taloyoak to 30% in Cambridge Bay. Notably, in the Kitikmeot Region the average monthly shelter cost is $1,270 and only 6% of owner-occupied households spend 30% or more of total household income on shelter costs (Statistics Canada 2011b). Staff housing and private market rental units form less substantial proportions of available housing in the communities (Table 2.5-3).

Even though public housing is common, it is in high demand; the Nunavut Housing Needs Survey (NBS 2010) reported a shortage of public housing and large waiting lists for applicants (Table 2.5-4). The survey also noted that the majority of applicants remain waiting for public housing for an average of one to two years. Again, the issue is more prevalent in the eastern Kitikmeot communities where the percentage of the population (15 years old or older) on the waiting list for public housing ranges from approximately 23% in Kugaaruk to a high of 33% in Taloyoak (Table 2.5-4). Comparatively, the percentage of the population in Cambridge Bay waiting for public housing is lower (12%).

While cost is not the primary factor that limits access to housing, understanding the dynamics at play behind housing tenure and cost provides insight as to the elements contributing to current circumstances in the region. Table 2.5-5 summarises the average and median cost for shelter of owned and rented dwellings. Notably, the median is lower in all cases, substantially so in some communities. Low median rents further exemplify the sizeable portion of individuals who reside subsidized housing. Across the Kitikmeot, average monthly shelter costs for rented dwellings ranged from $653 in Cambridge Bay to $271 in Kugaaruk in 2011 (Statistics Canada 2011b). Among owned dwellings, monthly shelter costs in Cambridge Bay more accurately reflect the Territorial average. Interestingly, monthly shelter costs for owned dwellings in the Kitikmeot are lowest in Taloyoak, the second smallest community in terms of population.

Funding for new public housing in Nunavut typically stems from the Nunavut Housing Corporation (NHC), the federal government, and the Canada Mortgage and Housing Corporation (CMHC). The recent 'Agreement for Investment in Affordable Housing' which involves matching funds from the CMHC and GN (2011-2014; CMHC 2013), announced that construction of 73 public housing units was completed in year two of the program (2012/2013) providing suitable housing for approximately 325 Nunavummiut[3] (CMHC 2013).

[3] Based on Nunavut's public housing occupancy rate of 4.44 - NBS. 2010. *Nunavut Housing Needs Survey Fact Sheet - Nunavut* .

Table 2.5-2. Housing in Kitikmeot Communities (Census 2011)

	Total Number Private Dwellings	Total Number of Persons in Private Households	Household Size						Two-or-More Family Households
			I Person	2 Persons	3 Persons	4 Persons	5 Persons	6 or More Persons	
Cambridge Bay	505	1,590	110	125	85	80	55	55	35
Kugluktuk	400	1,440	70	75	75	70	40	75	40
Gjoa Haven	275	1,280	30	20	40	40	45	100	50
Taloyoak	205	895	25	25	30	30	30	65	40
Kugaaruk	155	770	10	15	15	35	20	65	30
Kitikmeot	1,540	5,980	240	255	245	250	190	355	195
Nunavut	8,660	31,700	1,575	1,590	1,380	1,360	1,095	1,655	920

Source: Statistics Canada (2012).

Table 2.5-3. Housing Tenure by Community (2009/2010)

Community	Total Dwellings Occupied by Usual Residents	Owner-occupied Dwellings		Rented Dwellings					
				Public Housing		Government Staff Housing		Non-government Staff Housing and Private Market Rental Units	
		Number	Proportion	Number	Proportion	Number	Proportion	Number	Proportion
Cambridge Bay	480	140	30%	230	49%	70[E]	15%[E]	n/a	n/a
Kugluktuk	400	90	22%	250	64%	30	8%	20[E]	6%[E]
Gjoa Haven	230	40	18%	170	75%	10	4%	10	3%
Taloyoak	190	20	13%	140	77%	10	5%	10	6%
Kugaaruk	150	30	22%	100	69%	0	2%	10	7%
Kitikmeot Region	1,450	330	23%	900	63%	120	9%	80[E]	5%[E]
Nunavut	**8,550**	**1,880**	**22%**	**4,400**	**52%**	**1,350**	**16%**	**830**	**10%**

[E] = number estimated.
n/a = number considered unreliable.
Source: Nunavut Bureau of Statistics (2011)

Table 2.5-4. Number of Applicants Waiting for Social Housing (2009/2010)

Community	Total Population 15+	Population 15+ on Waiting List for Public Housing	
		Number	% of Total
Cambridge Bay	1,330	150E	12%
Kugluktuk	1,030	170	19%
Gjoa Haven	720	160	25%
Taloyoak	540	170	33%
Kugaaruk	460	100	23%
Kitikmeot Region	4,090	760	20%
Nunavut	22,780	3,780	18%

E = estimated.
Source: Nunavut Bureau of Statistics (2011).

Table 2.5-5. Shelter Costs in the Kitikmeot Communities (2011)

	Average Monthly Shelter Cost for Owned Dwellings ($)	Median Monthly Shelter Cost for Owned Dwellings ($)	Average Monthly Shelter Cost for Rented Dwelling ($)	Median Monthly Shelter Cost for Rented Dwelling ($)
Cambridge Bay	$1,523	$1,383	$653	$269
Kugluktuk	$1,272	$1,201	$413	$110
Gjoa Haven	$1,049	$933	$457	$161
Taloyoak	$706	$692	$364	$122
Kugaaruk	$1,117	$918	$271	$120
Kitikmeot Region	$1,270	$1,075	$473	$133
Nunavut	$1,522	$1,343	$654	$311

Source: Statistics Canada (2011b)

2.6 CRIME

From 2001 to 2009 across the Kitikmeot Region, violent and non-violent crime rates increased (Tables 2.6-1 and 2.6-2). Notable are the 2008 and 2009 increases in violent crime and the persistence of a relatively high rate of non-violent crime in Cambridge Bay, the 2009 sharp increase in violent crime in Gjoa Haven, and the increase in the non-violent crime rate in Gjoa Haven and Taloyoak. Over time, Kugarruk stands out as persistently having the lowest rates of violent and non-violent crimes.

For other violations (i.e., mischief, bail violations, disturbing the peace, arson, and offensive weapons) and federal statute violations (including drug-related offenses) Cambridge Bay again stands out as having the highest crime rates from 2001 to 2009 (Tables 2.6-3 and 2.6-4). Kugluktuk, in particular, had relatively high rates of other violations from 2003 through 2006, which has since decreased substantially. In other communities, crime patterns are less evident and have, in many instances, shown substantial fluctuations.

Table 2.6-1. Rate of Police-reported Violent Crimes, 2001 to 2009

Community	2001	2006	2009
Cambridge Bay	143	146	169
Kugluktuk	109	169	128
Gjoa Haven	56	45	162
Taloyoak	56	125	66
Kugaaruk	16	31	23
Kitikmeot Region	88	113	123
Nunavut	88	85	94

Notes: rate is the number of offences per 1,000 people, based on 2009 population estimates of police jurisdictions. Violent crime involves the use or threatened use of violence against a person, including homicide, attempted murder, assault, sexual assault, robbery, and abduction
Source: Nunavut Bureau of Statistics (2010b).

Table 2.6-2. Rate of Police-reported Non-violent Crimes, 2001 to 2009

Community	2001	2006	2009
Cambridge Bay	283	398	382
Kugluktuk	141	339	213
Gjoa Haven	101	58	191
Taloyoak	40	75	101
Kugaaruk	20	19	23
Kitikmeot Region	141	217	214
Nunavut	117	138	168

Notes: rate is the number of offences per 1,000 people, based on 2009 population estimates of police jurisdictions. Non-violent crime includes unlawful acts against property such as breaking and entering, possession of stolen property, theft, and fraud.
Source: Nunavut Bureau of Statistics (2010b).

Table 2.6-3. Rate of Police-reported Other Violations, 2001 to 2009

Community	2001	2006	2009
Cambridge Bay	59	204	177
Kugluktuk	90	142	80
Gjoa Haven	23	22	57
Taloyoak	27	72	29
Kugaaruk	2	15	6
Kitikmeot Region	47	108	85
Nunavut	272	331	399

Notes: rate is the number of offences per 1,000 people, based on 2009 population estimates of police jurisdictions. Other violations include mischief, bail violations, disturbing the peace, arson, prostitution, and offensive weapons.
Source: Nunavut Bureau of Statistics (2010b).

Table 2.6-4. Rate of Police-reported Federal Statute Violations, 2001 to 2009

Community	2001	2006	2009
Cambridge Bay	7	10	22
Kugluktuk	1	0	0
Gjoa Haven	16	3	6
Taloyoak	4	8	5
Kugaaruk	2	0	0
Kitikmeot Region	8	9	13
Nunavut	12	8	10

Notes: rate is the number of offences per 1,000 people, based on 2009 population estimates of police jurisdictions. Federal statues include drug-related offences.
Source: Nunavut Bureau of Statistics (2010b).

The number of calls for service (Table 2.6-5) is also an important indicator of the level of demand on policing services in each community, as a call for service may not necessarily result in a police-reported incidence of crime. For each community in the Kitikmeot Region, the number of calls for service has increased between 2010 and 2012, most notably in Kugaaruk where the increase was approximately 186% over the two years. Prisoner counts (number of admissions or arrests) have also increased in each community (Table 2.6-5). However, the increase has been small in Taloyoak (3%) and Cambridge Bay (6%), despite relatively larger increases in calls for service in those communities. The increase in prisoner counts has been much more substantial in Kugluktuk (43%), Gjoa Haven (51%), and Kugaaruk (71%), and is more reflective of the increase in calls for service.

Table 2.6-5. Police Calls for Service and Prisoner Count, 2010 to 2012

	Calls for Service (Number of Calls)			Prisoner Count (Number of Admissions)		
Community	2010	2011	2012	2010	2011	2012
Cambridge Bay	1,408	1,541	1,718	842	892	894
Kugluktuk	804	1,010	1,180	289	378	414
Gjoa Haven	426	444	576	166	146	251
Taloyoak	394	540	450	146	147	151
Kugaaruk	76	192	217	17	30	29

More recently, the total numbers of police-reported incidences of crime have been highest in Cambridge Bay (Table 2.6-6). Non-violent crimes (e.g., breaking and entering, possession of stolen property, theft, and fraud) had the highest rate among all types of crime, with Cambridge Bay again having the highest rate, followed by Kugluktuk and Gjoa Haven. The rate of violent crime (e.g., homicide, attempted murder, assault, sexual assault, and robbery) is also greatest in Cambridge Bay and Kugluktuk, followed closely by Gjoa Haven. Comparatively, crime rates were substantially lower in Kugaaruk and, to a lesser extent, Taloyoak (Nunavut Bureau of Statistics 2010b).

Table 2.6-6. Police-reported Incidents by Type of Offence, 2011

Community	Criminal Code Offences								Federal Statues		Total Violations	
	Violent Crime		Non-violent Crime		Other Violations		Traffic					
	Number	Rate	Number	Rate	Number	Rate	Number	Rate	Number	Rate	Number	Rate
Cambridge Bay	228	0.13	461	0.27	235	0.14	23	0.01	20	0.01	947	0.56
Kugluktuk	189	0.13	268	0.18	121	0.08	8	0.006	13	0.009	586	0.4
Gjoa Haven	78	0.07	118	0.1	74	0.06	4	0.003	6	0.005	274	0.24
Taloyoak	146	0.17	77	0.09	80	0.09	6	0.007	12	0.01	309	0.35
Kugaaruk	20	0.03	28	0.04	8	0.01	0	0.0	9	0.01	56	0.08
Kitikmeot Region	661	0.11	952	0.16	518	0.09	41	0.007	60	0.01	2,172	0.37
Nunavut	**3,328**	**0.1**	**5,604**	**0.17**	**4,017**	**0.12**	**238**	**0.007**	**469**	**0.01**	**13,229**	**0.4**

Notes: rate is the number of offences per 1,000 people, based on 2009 population estimates in police jurisdictions. Violent crime involves the use or threatened use of violence against a person, and includes homicide, attempted murder, assault, sexual assault, and robbery. Non-violent crime includes unlawful acts against property, such as breaking and entering, possession of stolen property, theft, and fraud. Other violations include mischief, bail violations, disturbing the peace, arson, prostitution, and offensive weapons. Traffic offences include the dangerous or impaired operation of a motor vehicle and driving a motor vehicle while prohibited to do so. Federal statues include drug-related offences.
Source: Nunavut Bureau of Statistics (2012).

Crime in the Kitikmeot communities was described as primarily consisting of family violence or domestic assaults, sexual assaults, thefts (mainly of ATVs and snowmobiles), break and enters, liquor and drug violations, and mischief (i.e., disturbing the peace, property damage; J. Atkinson, pers. comm.; P. Bouchard, pers. comm.; C. Gauthier, pers. comm.; D. Malakhov, pers. comm.; L. Sharbell, pers. comm.). Bullying, as well as physical and sexual abuse, are issues faced by youth, while drug and alcohol abuse and family violence cross all age groups (L. Sharbell, pers. comm.). Women can be the target of abuse by men (C. Gauthier, pers. comm.). Abuse of the elderly was also reported as being an issue in some communities (D. Malakhov, pers. comm.).

There are a number of underlying issues that are believed to attribute to crime in the Kitikmeot communities. The overcrowding of houses places stress on individuals and families, leading to family violence and substance abuse issues (L. Sharbell, pers. comm.). Much of the crime has been related to the abuse of alcohol and drugs (J. Atkinson, pers. comm.; P. Bouchard, pers. comm.; C. Gauthier, pers. comm.; D. Malakhov, pers. comm.; L. Sharbell, pers. comm.). Marijuana is the main drug that is available within Kitikmeot communities, but there are indications that this may be changing, particularly for the larger communities such as Cambridge Bay where cocaine and crack cocaine are appearing (C. Gauthier, pers. comm.). In terms of crimes committed by youth, boredom is believed to be the main reason there is a prevalence of ATV and snowmobile thefts, damage of property, break and enters, and mischief calls (J. Atkinson, pers. comm.; P. Bouchard, pers. comm.; L. Sharbell, pers. comm.). There is typically an increase in crime during the winter months when individuals are confined within the community and within homes, particularly during the holiday season (L. Sharbell, pers. comm.).

2.7 DEMOGRAPHIC CHANGE

2.7.1 Population

The population of the Kitikmeot Region is estimated to have grown to 6,010 persons in 2011, up 12% from 5,361 persons in 2006 (and up 11.3% from 4,816 persons in 2001; Statistics Canada 2011, 2006, 2001). Despite rapid population growth, the region has the lowest population in Nunavut, representing approximately 18% of the Nunavut Territory's population (NBS 2013b).

The 2011 NHS reported the population of Cambridge Bay to be 1,610, an increase of 9% from 1,477 in 2006. Cambridge Bay is the largest community in the Kitikmeot Region, followed by Kugluktuk and Gjoa Haven, with estimated populations of 1,450 and 1,280, respectively. Kugaaruk is the smallest community, with 770 inhabitants, followed by Taloyoak, which has a reported population of 900.

Population increase between 2006 and 2011 was notable high in Gjoa Haven and Kugaaruk (20% and 21%, respectively), followed by Taloyoak (11%) and Kugluktuk (11%) which are more reflective of the territorial average (12%). Cambridge Bay (9%), though notably lower in comparison to the other Kitikmeot communities, experienced population growth at a rate approximately 1.5 times higher compared to the national rate for the Aboriginal population in 2011 (Statistics Canada 2011b). As for the whole of Nunavut, strong natural increases (birth rate minus death rate) and a net in-migration from other areas of Canada are the main factors that contributed to the population growth in the communities (Statistics Canada 2010b).

For all communities, a high proportion of the population is Aboriginal, primarily Inuit. For the Kitikmeot Region as a whole, in 2011, the population was reported to be 90% Aborginal, totalling

approximately 5,445 individuals, of who 5,410 were Inuit (Statistics Canada 2011b; NBS 2013a). For Cambridge Bay, 77% of residents are Inuit. This proportion was higher in all the other Kitikmeot communities, with more than 90% of residents identifying as Aboriginal. The Nunavut average is 85% (NBS 2013b), much higher than the national average of 0.2% (Statistics Canada 2007). The breakdown of each community's 2011 demographic characteristics is shown in Table 2.7-1.

Table 2.7-1. Kitikmeot Community Populations (2011)

	2011 Population			
Community[1]	Total Population 2011	Inuit Population (%)	Median Age (years)	2006 to 2011 Change (%)
Cambridge Bay	1,610	77%	27	9%
Kugluktuk	1,450	91%	24	11%
Gjoa Haven	1,280	96%	21	20%
Taloyoak	900	97%	21	11%
Kugaaruk	770	98%	18	21%
Kitikmeot	6,010	90%	23	12%

[1]*Because of the seasonal and/or low number of permanent residents in the communities of Omingmaktok and Bathurst Inlet, reliable statistics for these communities are not available and thus omitted from the table.*
Source: Statistics Canada (2011b); NBS (2013b).

2.7.2 Age Distribution

All communities have a young population, with a median age ranging from 27 years in Cambridge Bay to only 18 years in Kugaaruk (Table 2.7-1). The entire Kitikmeot Region was reported to have a median age of 23 years, making it slightly younger than Nunavut's median of 24 years and much younger than the Canadian median of 41 years (Statistics Canada 2011b).

With the exception of Cambridge Bay, approximately one third (31 to 42%) of the population within Kitikmeot communities is under the age of 15 (Table 2.7-2). These proportions were substantially higher than the 17% for Canada overall. Kugaaruk had the youngest population among the Kitikmeot communities (Statistics Canada 2011b). Government projections predict that the population will age slightly by 2036, although it is still expected to remain substantially younger than the Canadian average (Nunavut Bureau of Statistics 2010a).

Table 2.7-2. Age Distribution by Community

	2011 Population			2011 Population (%)		
Community or Region	Under 15	15-64	65+	Under 15	15-64	65+
Cambridge Bay	460	1,105	65	29%	69%	4%
Kugluktuk	455	920	70	31%	63%	5%
Gjoa Haven	470	755	60	37%	59%	5%
Taloyoak	335	530	30	37%	59%	3%
Kugaaruk	320	430	20	42%	56%	3%
Kitikmeot Region	2,005	3,740	230	33%	62%	4%
Nunavut Territory	10,430	20,425	1,060	32%	65%	3%

Source: Statistics Canada (Statistics Canada 2011b)

2.8 OTHER MAJOR RESOURCE PROJECTS

2.8.1 Mine Development and Mineral Exploration

The potential for mine development in the west Kitikmeot Region is recognized to be high, and recent mining and mineral exploration activities have contributed substantially to local and regional economies and employment (NPC 2004).

In 2012, there were 65 exploration projects in Nunavut, including 22 in the Kitikmeot Region and 18 near the communities of Bathurst Inlet, Cambridge Bay, and Kugluktuk. This is a reduction from 95 active exploration projects in the Kitikmeot in 2011, including 35 near southern Bathurst Inlet. Currently, there are no active mines in the Kitikmeot Region. In 2012, there were 22 active mineral exploration projects, including 17 in the western Kitikmeot (Table 2.8-1) and an additional five in the eastern Kitikmeot at Committee Bay. Western Kitikmeot projects included base metals (five), gold (15), and diamonds (2; Nunavut Geoscience 2012).

Table 2.8-1. Exploration Projects in the Kitikmeot Region, 2012

Closest Community	Project Name	Commodity	Operator
Bathurst Inlet	Hackett River	Base Metals	Xstrata Zinc Canada
	Chicago	Gold	North Country Gold Corp.
	George (Back River Project)	Gold	Sabina Gold & Silver Corp.
	Goose (Back River Project)	Gold	Sabina Gold & Silver Corp.
	High Lake	Base Metals	MMG Resources Inc. (Minmetals)
	Izok Lake	Base Metals	MMG Resources Inc. (Minmetals)
	Jericho Mine	Diamonds	Shear Diamonds Ltd.
	Lupin Mine	Gold	Elgin Mining Inc.
	Ulu	Gold	Elgin Mining Inc.
	Wishbone	Base Metals	Xstrata Zinc Canada
	Wishbone Gold	Gold	Sabina Gold & Silver Corp.
Cambridge Bay	Doris (Hope Bay Project)	Gold	TMAC Resources Inc.
	Madrid (Hope Bay Project)	Gold	TMAC Resources Inc.
	Boston (Hope Bay Project)	Gold	TMAC Resources Inc.
	Chicago (Hope Bay Project	Gold	TMAC Resources Inc.
	Oro	Gold	North Arrow Minerals Inc.
Kugluktuk	Hammer	Diamonds	Stornoway Diamond Corporation
	Hood	Base Metals	MMG Resources Inc. (Minmetals)

Source: Nunavut Geoscience (2012).

Natural Resources Canada's initial 2012 estimate of annual spending on exploration and deposit appraisal by all companies active in Nunavut was $569 million, which was later revised downward to $427 million (a 25% decrease), likely linked to the cessation of activities associated with Hope Bay Project in that year. The revised estimate represents a 20% decrease as compared to spending in 2011.

Exploration and deposit appraisal expenditures in Nunavut totalled an estimated $263.8 million in 2010, up from $187.6 million in 2009 (NRCan 2012). As shown in Table 2.8-2, mineral exploration in the territories has varied over the past seven years. Together the territories accounted for 20.8% of Canadian mineral exploration spending in 2012, down from 22.7% in 2011 (Up Here Business 2012).

Table 2.8-2. Mineral Exploration in the Canadian Territories, 2006 to 2012

	Mineral Exploration Spending (millions)						
	2006	2007	2008	2009	2010	2011	2012
Nunavut	$210.6	$338	$432.6	$187.6	$256.7	$536	$427
Northwest Territories	$176.2	$193.7	$147.7	$44.1	$81.7	$94	$136
Yukon	$106.4	$144.7	$134	$90.9	$156.9	$332	$292

Source: Natural Resources Canada (2013).

There are currently three advanced exploration projects on Inuit Owned Land (IOL) parcels in the Kitikmeot; namely Contwoyto (Shear Diamonds Ltd.), High Lake (MMG), and Hope Bay. Recently, MMG notified NIRB of their intention to further delay updates to the High Lake project description while attempting to identify additional mineral resources (Nunatsiaq 2014b) and also recently, Shear Diamonds has undergone substantial changes to its corporate status and structure (Herman 2013).

Early in 2014, Sabina Gold and Silver submitted their draft Environmental Impact Statement (EIS) for the Back River Project; however, currently Nunavut's only operational mine is Agnico-Eagle's Meadowbank Gold Mine near Baker Lake (in the Kivalliq Region). Other projects that have advanced in the environmental review process include Areva Resources Canada's Kiggavik Uranium Project and Agnico-Eagle's Meliadine Gold Mine Project. NIRB expects submission of Meliadine's final EIS in April 2014 (Nunatsiaq 2013a) and Kiggavik's Final Environmental Impact Statement by September 2014 (Nunatsiaq 2013b). Baffinland Iron Mines Corporation's Mary River Iron Project was originally approved by the NIRB in December 2012 but is now back the environmental review process following an announcement to scale the project and to include an early revenue phase (Nunatsiaq 2014c).

Also in the Kitikmeot, the Lupin gold deposit was in production from 1982 to 1998 and again from 2000 to 2005. At the time of closure, 400,000 ounces of gold were estimated to remain. As of 2013, Lupin was owned by Elgin Mining Inc. The Lupin mine project was closed indefinitely in mid-2013 following corporate financial losses and falling gold prices (Nunatsiaq 2013c).

2.8.2 Oil and Gas Exploration and Development

Oil and gas related exploration and licenses in Nunavut are concentrated in the Eastern Arctic (northern Hudson Bay and around Baffin Island), the Arctic Islands, and Sverdrup Basin (INAC 2011c, 2011d). Current exploration and development are concentrated in the eastern Arctic (northern Hudson Bay and around Baffin Island), the Arctic Islands, and Sverdrup Basin (INAC 2011b, 2011a). A number of exploratory and delineation wells are concentrated in the northwest of Qikiqtani Region (NPC 2008). Two of the largest undeveloped gas fields in Canada are in the Arctic Islands (INAC 2000).

As of 2008, the only oil and gas infrastructure in the Kitikmeot region was an exploratory well in northern Kitikmeot, on Prince of Wales Island. The majority of the southern Kitikmeot region is not recognized as having oil and gas potential (NPC 2008). Discovered oil and gas supplies in Nunavut and offshore in the Arctic are described in Table 2.8-3. The discovered gas supplies in the Arctic Islands are comparable to those in the Beaufort Sea-Mackenzie Delta Region; however, industry has not shown a strong interest in the exploration and development of reserves in the Arctic Islands (INAC 2009).

Table 2.8-3. Oil and Gas Resources in Nunavut and Arctic Offshore

Resources	Discovered Resources		Undiscovered Resources		Ultimate Potential	
	$10^6 m^3$	MMbbls	$10^6 m^3$	MMbbls	$10^6 m^3$	MMbbls
Oil Resources	51.3	322.9	371.8	2339.4	423.1	2662.3
Gas Resources	449.7	16.0	1191.9	42.3	1641.6	58.3

Source: INAC (2009).

3. EMPLOYMENT AND EXPENDITURES BY THE PROJECT

As part of the proposed Project changes, TMAC would like to access the Doris subdeposits via the Doris North Portal. This would result in a two to four year extension of the Doris North Project mine life. Associated with this is an initial mining rate of 1,000 tonnes per day (tpd; yearly average ore mining rate) with ore from these deposits processed by the existing mill at a rate of 800 tpd (yearly average). These rates may ultimately grade up to a mining rate of up to 2,000 tpd yearly average and a 1,800 tpd yearly milling average. This will result in a change in the direct employment and expenditures by the Project compared to the information presented in the 2005 Doris North Final EIS submission (Miramar 2005). An examination of how employment and expenditures are predicted to change with the proposed Project amendment serves as a basis from which to screen potential changes in the predicted socio-economic effects.

3.1 PROJECT EMPLOYMENT

Following the acquisition of the Project by TMAC, the percentage of person-days worked in 2013 that consisted of Inuit from Kitikmeot communities was approximately 16% (Table 3.1-1). This includes both TMAC employees and contractors. TMAC has been successful in engaging Inuit as part of the Project workforce, and has been able to retain a core number of skilled and experienced workers. In 2013, the Project hired approximately six employees from Cambridge Bay, seven from Kugluktuk, two from Taloyoak and three from other communities (A. Buchan, pers. comm.). A total of approximately 7,688 person-days of work were generated by the Project in 2013; out of this, approximately 976 person-days of work experience accrued to Inuit workers.

Employment attributed directly to the Project is summarized in terms of person-days worked and full-time equivalent (FTE). The former is typically based on a 12-hr work day and the latter is standardized to a 2,080-hour year. The number of person-days worked by employees and contractors of the Doris North project are summarized in Table 3.1-1.

Table 3.1-1. Doris North Employment (Estimated Person Days for Employees and Contractors), 2011-2013

	2009	2010	2011	2012[1]	2013[2]
Person-days Worked	30,453	67,687	102,819	35,202	7,688
Full-time Equivalent (FTE)	175.7	390.5	593.2	203.1	44.4
Inuit Person-days Worked (% of total person-days worked)	11%	13%	15%	20%	16%
Monthly Average Number of Employees[1]	83	82	282	130	41

Notes:
[1] Estimate for Q1 to Q3
[2] Estimate for Q2 to Q3
Source: A. Buchan, pers. comm.

The amount of work provided by the Project increased substantially from approximately 176 FTEs (30,450 person-days) in 2009 to 593 FTEs (102,820 person-days) in 2011. In 2012, employment fell significantly due to the Project entering Care and Maintenance and the following change of ownership. Total employment was approximately 44 FTEs in 2013, while the Project remained in Care and Maintenance.

There was a monthly average of 41 workers on the Project in 2013, consisting of both TMAC employees and contractors (Table 3.1-1). Personnel at the site were predominantly contractors, with a daily average of 13 in the month of April, increasing to 54 in September as activity associated with the Project increased. Throughout 2013, a total of 19 individuals were directly employed by TMAC from Kitikmeot communities (at one time or another).

In 2013, TMAC employees consisted of 73% male and 27% female by person-days worked (A. Buchan, pers. comm.). In 2010 and 2011, female and male employment by person-days averaged approximately 20% and 80%, respectively (A. Buchan, pers. comm.). Also in 2013, TMAC hired one student to work at the Project. Comparatively, in 2010, there were 16, and in 2011, 20 individuals, primarily students, hired as Environmental Field Assistants to work on the Project (A. Buchan, pers. comm.).

During operation, Doris North employment opportunities are predicted to be longer-term, with an increasing Inuit share. Based on the previous mine design (Miramar 2005), employment was estimated to average approximately 165 persons and total about 370 person-years during the 27 months of operation. It was also estimated approximately 155 person-years of this would consist of Nunavummiut, representing about 42% of the total mine workforce.

With accessing the Doris subdeposits via the Doris North Portal, total employment during operation is predicted to increase to an average of approximately 230 persons over seven years, or approximately 1,610 person-years.[4] If 42% of the workforce was comprised of Nunavummiut, this would correspond to a total of about 97 workers (compared to 69 in the original FEIS prediction). While TMAC is not prepared to commit to an Nunavummiut hiring target (in absolute or percentage basis), it is reasonable to anticipate this level of employment being possible during operations based on the experience to date during the construction phase coupled with the mitigating measures planned to support Nunavummiut employment.

3.2 PROJECT EXPENDITURES

A summary of Project expenditures for 2008, 2009 and 2010 is shown in Table 3.2-1. The share of contracts to the Kitikmeot Corporation and affiliated businesses increased from approximately 27% of annual Canadian spending on Doris North in 2008 to approximately 51% in 2010; from 2008 to 2010, this spending totaled approximately $150 million.

[4] Employment estimates are a rough approximation. Detailed workforce requirements have yet to be defined for the Project. Furthermore, with respect to Nunavummiut hires there are a large number of variables that ultimately determine the level of hiring achieved, including the decisions of individual workers. This means that inherently there is uncertainty in the predictions made.

Table 3.2-1. Doris North Direct Expenditures, 2008 to 2010

Contractor	2008		2009		2010	
	Value (million $)	Share of Total (%)	Value (million $)	Share of Total (%)	Value (million $)	Share of Total (%)
Kitikmeot Corporation and Affiliated	$14.2	26.7%	$31.0	39.3%	$104.6	50.6%
Other Kitikmeot-based Businesses	$0.2	0.3%	$6.8	8.6%	$10.6	5.1%
Non-Inuit Businesses	$38.8	73.0%	$41.2	52.1%	$91.6	44.3%
Total	***$53.2***	***100.0%***	***$79.0***	***100.0%***	***$206.8***	***100.0%***

In 2013, over $5.6 million or 33% of Project contract spending went to Kitikmeot-based or Inuit owned businesses. In 2012, the total value of contracts was $39.0 million, with 1.4% ($0.5 million) awarded to Kitikmeot-based contractors and 72.1% ($28.1 million) to Kitikmeot Corporation affiliates.

The Project's use of Kitikmeot-based or Inuit owned businesses will continue. This includes business opportunities for the provision of air transportation, logistical services, camp supplies, medical and safety supplies, and catering, as well as other goods and services.

Updated, detailed annual operational expenditure (Opex) information is not yet available for the Project. Therefore, it is not possible at this time to provide an updated forecast of annual expenditures for the operations phase. As with employment, the proposed amendment to the Project will result in the prolonging of contract and business opportunities. This will be directly associated with extension of mine life. The total annual value of contracts is also expected to increase in magnitude with an increase in the mining rate.

4. MITIGATION AND SCREENING OF SOCIO-ECONOMIC EFFECTS

This section provides a review of the 2005 Doris North Final EIS mitigation and effects assessment conclusions, and a screening of the effects of the proposed changes in the Project in relation to the identified mitigation and effects assessment conclusions.

4.1 2005 SOCIO-ECONOMIC MITIGATION AND EFFECTS ASSESSMENT CONCLUSIONS

A summary of the identified potential socio-economic effects of the Project, as well as described mitigation, as specified in Miramar (2005) is provided in Table 4.1-1.

Table 4.1-1. 2005 Socio-economic Effects and Mitigation Summary

Valued Socio-economic Component (VSEC)	Potential Effects	Mitigation
Employment and Economy		
Employment Opportunities and the Economy	• Increased employment opportunities and income • Loss of employees from other industries to the Project • Increased demands on community services • Cost of living increases • Amplified social problems related to increased income • Unemployment following mine closure	• Adhering to the principles of IQ as much as possible • Hire Inuit to facilitate work force transition • Build cultural awareness and enforce harassment policies • Inuit will be given preferential treatment for employment • Promote awareness of employment and service procurement opportunities within Kitikmeot communities • Collaborate with training institutions • Develop and implement a Recruitment Strategy • Provide annual business opportunities forecasts • Host annual Summer Camp for students to get exposure to trades and technology options • Facilitate workshops for family financial management
Education and Training	• Increased training opportunities • Increased educational attainment within the region • Increased skill-base within the region	• Collaborate and partner with relevant agencies and contractors to ensure skill requirements are being met • Education and training providers develop training programs geared toward the long-term employment of women in non-traditional occupations

(continued)

Table 4.1-1. 2005 Socio-economic Effects and Mitigation Summary (completed)

Valued Socio-economic Component (VSEC)	Potential Effects	Mitigation
Employment and Economy *(cont'd)*		
Contracting and Business Opportunities	• Increased contract and business opportunities • Increased capacity for business within the region	• Provide assistance, feedback, information and lead time to contractors from the Kitikmeot communities on bids and bidding policies • Require and monitor local content plans on major bids • Waive bond provisions at tender for Inuit-owned businesses
Community Services and Infrastructure		
Health Services	• Project-induced/related exposures to disease causing contagion conditions • Project-related unsafe working practices causing injury • Project-induced or related changes in income levels and associated spending patterns, causing stress or substance and/or family abuse • Physical risk levels • Job-related stress levels, which might increase emotional or mental health disorders	• Provision of qualified medical personnel and pre-employment medicals • Develop emergency response and contingency plans • Provision of alcohol and drug education and enforcement of alcohol and drug free site policies • Collaboration with regional health services • Enforcement of safety policies
Social Services	• Job-related issues, such as worksite harassment, safety, undervalued work • Mental or emotional disorders induced by various conditions, including family separation, costs and inaccessibility of child care, substance abuse, stress associated with work, and spousal stress associated with lone household management	• Orientation programs • Facilitating and promoting fairness in the workplace • Provide formal processes for issue resolution • Keeping family groups or community groups of workers together for support while away from home • Provision of free and confidential Employee and Family Assistance Program (EFAP) for support on a wide range of issues
Safety and Protection Services	• Increased alcohol abuse, or deliberate acts or incidents might increase the number of occasions requiring response from the RCMP • Reduced level of service due to increased turnover of RCMP officers in response to elevated on-the-job demands	• Enforcement of alcohol and drug free site • Liaise and collaboration with local protective services • Conduct pre-employment criminal record checks

After mitigation, the residual socio-economic effects identified in the Doris North Final EIS (Miramar 2005) can be summarized as follows:

- Increased expense to the hamlets for recruitment and retraining of workers providing services in the community because workers decide to work at the mine site;
- Increased personal income with the increase in employment and business opportunities;
- Increased cost of living in the communities;
- Increased demands on community services by the individual or family members due to time away from the community and increased personal income;
- Increased demands on housing and other community infrastructure due to immigration of workers; and
- Benefits to quality of life due to increased individual and family income.

The Doris North Final EIS (Miramar 2005) concluded that all residual adverse environmental effects on community services and infrastructure were negligible to minor, and not significant. The Project was predicted to result in benefits in terms of employment, skills development, and the economy.

4.2 SCREENING OF CHANGES TO SOCIO-ECONOMIC EFFECTS

The proposed amendments to the Project as they potentially affect Valued Socio-economic Components (VSECs) are not anticipated to result in any new effects. Thus, the potential effects as identified in Miramar (2005) remain valid. The VSECs were selected based on both western scientific data and *Inuit Qaujimajatuqangit*.

The following sections revisit the potential socio-economic effects in light of the proposed amendments, including an evaluation of the identified mitigation, monitoring, and management procedures.

4.2.1 Mitigation

With respect to employment and business opportunities, TMAC will continue with mitigation initiatives as outlined in Table 4.1-1. This includes continuing to work with stakeholders and suppliers from the communities to facilitate the direct and indirect hiring of Nunavummiut throughout operation. The TMAC employment strategy includes entry-level employment skills training, employee development, and an employee retention strategy, among others.

Education and training initiatives in the Kitikmeot Region will be continued so that a greater proportion of Nunavummiut meet the requirements for employment with the Project. Initiatives around the partnerships for training, such as with the Arctic College, will continue to be pursued and developed. It is predicted that with the longer duration of mine operation a greater number of Inuit will be able to take advantage of education and training opportunities. This will result in an increase in the human capital available within Kitikmeot communities, thus supporting continued economic development across the region.

With respect to health services, social services, and safety and protection services, current and planned mitigation will be developed to accommodate the Project changes associated with the proposed amendment. Key mitigation will be as described in Table 4.1-1 (Miramar 2005).

4.2.2 Residual Socio-economic Effects

Extension of the mine life and increase in the mining rate will result in a change on employment and the economy due to additional economic production, value-added (Gross Domestic Product, or GDP) employment, personal income, and government revenue. The economic benefits of a mine life extension are predicted to occur across Canada, Nunavut and, more specifically, within the Kitikmeot Region. The effects of the additional business activity, employment, and income on communities are expected to change from that assessed in the 2005 Final EIS. Specifically, there is expected to be an increase in the total economic benefits of the Project to Nunavut with the increase in the mining rate and mine life, and the increase in the number of workers on-site.

The increase in the size of the workforce and the extension of the mine life will increase the employment benefits to Kitikmeot residents. With achievement of existing objectives, Inuit employment is expected to increase to an average of approximately 95 persons (as an approximate conservative estimate).

With respect to community services and infrastructure, minimal adverse effects are predicted on health care services, community well-being and delivery of social services, and public safety and protection services. As reported in the Doris North Final EIS (Miramar 2005), the Project is predicted to have a negligible effect on in-migration. This is primarily because of the adoption of a fly-in/fly-out arrangement with well-equipped camp facilities, as well as the high unemployment rates within Kitikmeot communities, that will discourage people from moving to the Kitikmeot Region for mine-related employment. In-migration that does occur will be primarily associated with indirect and induced business growth, mainly in Cambridge Bay, when qualified local workers are not available. This will minimize any additional demand on community services and infrastructure because of an increase in the local population due to the Project.

The expected increase in personal incomes, business incomes, and government revenues that are realized over the extended life of the mine is predicted to result in an increase in the benefits to community services and infrastructure. This is because of the overall positive effects of increases in employment and income on human health and well-being. There may be some increases in socially-damaging behaviour (e.g., gambling, substance abuse), as well as family stress and dysfunction, associated with increases in disposable incomes within communities. Levels of participation in traditional land-based activities may also decline with mine-related employment. However, positive effects on personal financial resources will increase the options available for individuals and increase government revenues to allow for an enhancement of supporting public infrastructure and services.

4.2.3 Cumulative Effects

The likely development of other mine projects in the Kitikmeot region and elsewhere in Nunavut was anticipated and included as part of the cumulative effects assessment presented in the Doris North Final EIS. The updated list of likely projects as described in Section 2.8 of this memo is

consistent in size and type with the project list that served as the basis for the earlier cumulative effects assessment, although the specific mix of projects has changed somewhat (Miramar 2005). It is predicted that the proposed amendments to the Project will not substantially change the characteristics of the potential interactions with other projects that may act cumulatively on either employment and economy or community services and infrastructure. Thus, the cumulative effects assessment conclusions as described in Miramar (2005) are predicted to remain valid.

4.2.4 Monitoring and Management

The Project has an existing Socio-economic Monitoring Program that will accommodate the proposed amendment activities.

The Socio-economic Monitoring Program for Doris North defines a number of indicators that have been selected based on the impact predictions and mitigation measures in the FEIS. For each social and economic indicator, specific measures, data requirements, and data sources have been identified, and data collection and reporting is on-going. The Socio-economic Monitoring Program allows for both early detection of adverse effects on valued socio-economic components (VSECs) and reporting of impact and benefit objectives for the Project. Extension of the Doris North mine life is not expected to result in the need to change the monitoring program given that there are no material differences in the nature of the predicted residual effects. The Socio-economic Monitoring Committee (SEMC), which includes members from key government and stakeholder agencies, provides additional oversight to help ensure that on an on-going basis the monitoring program meets its objectives.

5. CONCLUSIONS

For employment and economy, the proposed amendment to extend the mine life does change the predicted environmental impacts of the undertaking in that the total benefits are predicted to increase. There does remain the potential for there to be an adverse effect on other community employers, such as local government, if the labour demands of the Project result in a shortage of skilled workers resulting in an inability to fill certain positions; however, the effect is predicted to remain minor and be increasingly alleviated over the longer term. The mitigation measures in place for the Project remain appropriate to address adverse effects and enhance the positive effects on employment and income, education and training, and business opportunities. The residual effects assessment conclusions remain valid.

With respect to community services and infrastructure, minimal adverse effects are predicted on health care services, community well-being and delivery of social services, and public safety and protection services. The mitigation measures in place for the Project are appropriate to address the predicted adverse effects on health services, social services, and safety and protection services. The residual effects assessment conclusions remain valid.

In sum, it is predicted that the adverse socio-economic effects based on the revised Project plan, as addressed in the amendment package, will be able to be managed with the mitigation and monitoring as previously identified (Miramar 2005). The extension of the mine life and mining rate are predicted to increase the socio-economic benefits of the Project because of the increase in employment, income, and business activity.

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Definitions of the acronyms and abbreviations used in this reference list can be found in the Glossary and Abbreviations section.

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