17. SOCIAL EFFECTS ASSESSMENT

17.1. INTRODUCTION

This chapter of the Application for an Environmental Assessment Certificate (the Application) assesses the potential social effects of the proposed Kemess Underground Project (the Project; Figure 17.1-1). The assessment is based on socio-economic baseline data collected for the Project presented in Appendix 16-A. The chapter has been prepared to fulfill the requirements of the Application Information Requirements (AIR; BC EAO 2016).

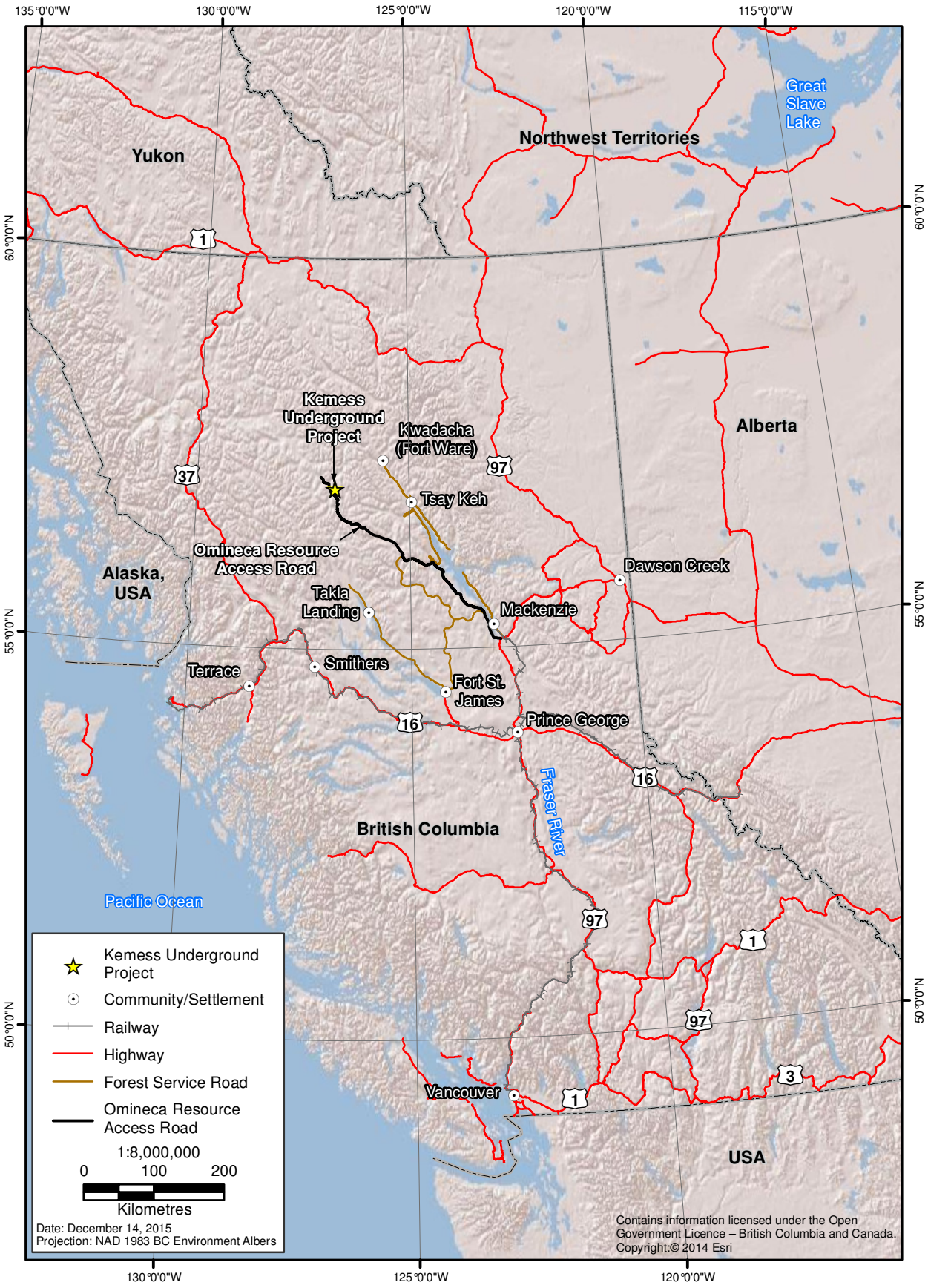
The Project is situated on provincial Crown land within the Peace River Regional District (PRRD) in the north-central interior of BC, and accessed via the existing Omineca Resource Access Road (ORAR) from the town of Mackenzie. Of the communities included in the baseline study, Prince George, Smithers, Terrace, and Mackenzie have developed Official Community Plans (OCPs) that recognize the regional importance of the mining industry to past, current, and future economic sustainability. The other study communities—Kwadacha, Tsay Keh, and Takla Landing—are managed in accordance with the *Indian Act* (1985a; last amended in 2013) which governs matters pertaining to Indian status, Indian bands, Indian settlements and Indian Reserves (IRs). The Act sets out rules for governing IRs, defines how bands can be created, and spells out the powers of band councils. Bands do not have to have reserves to operate under the Act.

Potential effects of the Project on the social environment are expected to be driven by Project employment—as assessed in Chapter 16—including direct employment with the Project, indirect employment resulting from the procurement of goods and services, and induced employment created by workers spending their incomes in local communities. Stemming from potential employment effects, social effects may relate to individual and family income, training and skills development, work rotation schedules, and family dynamics. Social effects may also relate to other types of effects, such as changes in land use.

This chapter is based on the assessment methodology provided in Chapter 8 and is organized as follows:

- Section 17.2 provides a description of the regulatory and policy framework relevant to the assessment of social effects;
- Section 17.3 presents the scoping exercise in which social Valued Components (VCs) and assessment boundaries are defined;
- Section 17.4 describes the social setting in which the Project is situated, based on the Socio-economic Baseline Report (Appendix 16-A), including the existing socio-economic characteristics of the study area;
- Section 17.5 identifies potential social effects of the proposed Project on the social VCs, and the mitigation measures that will be used to avoid or reduce adverse effects;

Figure 17.1-1
Project Location



- Section 17.6 assesses the potential residual social effects of the Project that remain after the implementation of mitigation measures;
- Section 17.7 assesses the potential cumulative social effects of the Project; and
- Section 17.8 describes the conclusions of the social effects assessment.

17.2. REGULATORY AND POLICY FRAMEWORK

This section identifies and describes provincial and federal legislation, policies, best management practices and guidance documents related to the social environment. The Project is subject to the BC *Environmental Assessment Act* (BC EAA; Bobbink and Lamers 2002) and the *Canadian Environmental Assessment Act, 2012* (CEAA 2012), both of which identify requirements related to social effects:

- The BC EAA requires an assessment of social effects.
- Section 5(1)(c) of the CEAA 2012 requires an assessment of how environmental effects caused by the Project could affect the socio-economic and health conditions of Aboriginal peoples. These effects are assessed in Chapter 20 (Effects of Environmental Changes on Aboriginal Peoples).
- The Project is located within the Mackenzie Land and Resource Management Plan (2000), which covers an area of 6.4 million hectares in north-central interior of British Columbia (BC). Section 1.2 of the Plan provides a social and economic description of the area covered by the Plan.

Provincial legislation relevant for communities and local governments include the Community Charter (2003) and the *Local Government Act* (1996c), both of which are administered by the Ministry of Community, Sport, and Cultural Development. The Community Charter came into effect in 2004, and establishes principles for municipal governance and provides the legal framework for municipal powers/duties (e.g., taxation, financial management and bylaw enforcement).

The *Local Government Act* (1996c) establishes the legal framework for regional districts and defines requirements for elections and land use planning (BC Ministry of Municipal Affairs n.d.). Regional Districts provide an administrative and political framework for:

- providing region-wide services such as regional park management and emergency telephone services such as 9-1-1;
- providing inter-municipal or sub-regional services such as recreation facilities where residents of a municipality and residents in areas outside the municipality benefit from the service; and
- acting as the general local government for the electoral areas (i.e., outside municipalities) and providing local services such as waterworks and fire protection to incorporated communities (Ministry of Community Sport and Cultural Development 2015).

Municipal governments are responsible for community services, including fire protection (under the *Fire Services Act* (1996a)); engineering services (including water supply, waste management, and transportation); parks and recreation; housing and property zoning; and the development and implementation of OCPs. Municipal governments are also empowered to form committees and task forces to address specific community issues. In the absence of a municipality, services may also be provided by a regional district.

Several community services are the responsibility of governance structures that may extend across municipalities and/or regional districts, including health care services (Health Authorities under the *Health Authorities Act* (1996b)) and education (School Districts under the *School Act* (1996a)).

17.3. SCOPE OF THE EFFECTS ASSESSMENT

Establishing the scope of the assessment involved a number of steps, including a review of the Project's components and activities (as defined in the Project Description in Chapter 5) and review of current and relevant EAs for comparable projects. Valued components (VCs) and the boundaries of the assessment were selected specifically for the Project, based on issues of concern and the likelihood of potential effects.

17.3.1. Valued Components

The BC Environmental Assessment Office (BC EAO) defines VCs as aspects of the natural and human environment "that are considered important by the proponent, public, First Nations, scientists, and government agencies involved in the assessment process" (BC EAO 2013). To be included in the Application, there must be a perceived likelihood that the VC will be affected by the proposed Project. VCs proposed for assessment were identified in the Application Information Requirements (AIR; BC EAO 2016) and in the VC Scoping Document (ERM 2014).

17.3.1.1. Consultation Feedback on Proposed Valued Components

A preliminary list of proposed VCs was drafted early in Project planning based on the preliminary Project description, understanding of the local area and regions where the proposed Project would be located, and consultation with government agencies, Aboriginal groups, the public and stakeholders. A summary of the social VCs that were considered, and how consultation feedback was incorporated into the selection of VCs for the assessment, is summarized in Table 17.3-1.

17.3.1.2. Selecting Valued Components

As described in Chapter 8, Assessment Methodology, the selection of VCs for inclusion in the assessment was guided by an issues scoping process which included a comprehensive and systematic review of issues raised during consultation, potential interactions between Project components and activities with aspects of the social environment, and professional expertise and past experience with other similar projects. A preliminary list of VCs was compiled early in the EA process. To be included in the assessment, VCs must be relevant, comprehensive, representative, responsive, and concise. The scoping process aimed to select fewer, well-defined VCs in order to focus the assessment on the most important and relevant effects.

Table 17.3-1. Summary of Consultation Feedback on Proposed Valued Component(s)

Topic	Feedback by*			Consultation Feedback	Response
	AG	G	P/S		
Community Well-being	x	x		• Important to recognize the relationship between income inequality and health. • Transportation can be a barrier to employment for Aboriginal people resident on reserve. • Mining jobs can be incompatible with the practice of traditional activities. • Work rotation schedules and high incomes can create pressures on workers and their families. • Socio-economic changes can have implications for health. • Aboriginal community baseline conditions are sufficiently different from non-Aboriginal communities, such that the groups should be considered separately. • The subsistence economy is important for many Aboriginal families. Aboriginal and non-Aboriginal people will experience changes in hunting (and other activities) differently from non-Aboriginal households.	These issues and concerns are typical of natural resource projects, and will be explored within the effects assessment. Potential effects related to traditional practices and the subsistence economy are addressed in Chapter 20.
Commercial Land Use	x			• Commercial guide outfitting and trapline tenures are present in the study area. Some of these tenures are held by Aboriginal persons.	AuRico has agreements in place with two commercial tenure holders in the area and intends to negotiate an agreement with a third commercial tenure holder. Effects related to commercial tenures are not expected. Potential effects on Aboriginal land use, including land-based businesses, are addressed in Chapter 20.
Education, Skills, and Training	x			• Interest in training programs, activities, and opportunities.	Project benefits, including (economics, workforce, other impacts, and local facilities) are described in Section 1.11.
Visual Quality	x			• Changes in views and visual quality may affect land users.	No recreational land use sites or viewpoints are identified in the vicinity of the Project. The Project's aboveground presence will also be limited due to use of the pre-existing Kemess South (KS) infrastructure. Effects related to visual quality are not expected.

(continued)

Table 17.3-1. Summary of Consultation Feedback on Proposed Valued Component(s) (completed)

Topic	Feedback by*			Consultation Feedback	Response
	AG	G	P/S		
Community Infrastructure, Services, and Housing	x	x		• Primary health care services in neighbouring communities may be strained by increased demand as a result of workers moving to, or transiting through, communities as a result of the Project and/or contribute to cumulative economic development. • Northern Health reports existing capacity challenges. • Impacts should be assessed based on the current state of communities. There will be increased pressure since KS (as it is now) has been in care and maintenance with a limited workforce.	Based on the Project's plans for employee transport and past experience with KS, in-migration to northern communities is not expected. Workers will have minimal time in transit through local communities, and the Project will provide on-site medical and first aid services for the workforce. Effects on community infrastructure, services and housing are not expected.
Recreational land uses	x			• Enjoyment of natural views and landscapes are important for recreational land users.	Baseline studies have not identified recreational land users or activities in the vicinity of the Project. Effects on recreation are not expected.
Traditional Aboriginal Land Use	x			• Effects to TKN's ability to harvest and use resources. • Identification of areas used for cultural activities.	Addressed in Chapter 21, Effects of Changes to the Environment on Aboriginal People.
Navigable Waters				• No comments received.	Excluded as the Project will not affect any listed navigable water bodies.

AG = Aboriginal group - Leadership or organization representing a First Nation or Métis organization.
G = Government – Local, provincial, and federal agencies.
P/S = Public/Stakeholder - Interest groups, landowners, tenure and license holders, members of the public.

Considering the above, the following candidate VCs were considered and excluded from the assessment:

- **Commercial Land Use**: Tenured land uses (including guide outfitting, trapping, grazing, and other land-based activities by non-Aboriginal individuals) is excluded from the assessment as AuRico has agreements in place with the holder of guide outfitter licence #700004 and the holder of trapline TR739T006 and intends to negotiate a new agreement with guide outfitter #600447. Baseline information is documented in Appendix 17-A (Non-traditional Land Use Baseline Report).
- **Traditional Land Use**: Traditional land use activities currently practised by Aboriginal peoples are assessed separately in Chapter 20 (Effects of Changes to the Environment on Aboriginal People). Baseline information is documented in Appendix 20-A (Traditional Knowledge and Land Use Study).

- **Education, Skills, and Training**: The Project will require skilled labour for Construction and Operations, and skills training may be required to help recruit some of the Project's workforce. AuRico has an Interim Measures Agreement (IMA) with the Takla Lake First Nation (TLFN), Tsay Keh Dene Nation (TKDN), and Kwadacha Nation (KwN) which provide for education and skills development. Baseline information is documented in Appendix 16-A (Socio-economic Baseline Report).
- **Visual Quality**: The Project is not visible from any community or public area, and there will be limited new surface disturbance created by the Project. Potential changes to visual quality and related effects on the current use of land and resources for traditional use purposes are considered in Chapter 20.
- **Community Infrastructure, Services, and Housing**: The Project's workforce will operate on a fly-in fly-out roster. AuRico expects that approximately 40% of the Project's workforce will be residents of the Fraser-Fort George, Peace River, Kitimat-Stikine, and Bulkley-Nechako Regional Districts. While on shift, workers will be housed in the camp at the mine site. Basic health care will also be provided on site. Based on past experience with the KS Mine, the Project's demand on community infrastructure and services (e.g., emergency services, housing) is expected to be negligible. Baseline information is documented in Appendix 16-A (Socio-economic Baseline Report).
- **Recreational Land Use**: Potential effects on public recreation are not expected as access to the KS Mine site area is presently restricted to the public for safety reasons and to comply with the BC *Mines Act* (1996d), and no recreation areas or activities have been identified in the vicinity of the Project. Public access to the Kemess Underground Project will also be restricted. Baseline information is documented in Appendix 17-A (Non-traditional Land Use Baseline Report).
- **Navigable Waters**: The Project does not propose any works within a waterbody listed under the *Navigation Protection Act* (1985).

The assessment of potential social effects of the Project will therefore focus on the Community Well-being VC. In recognition of the differences between Aboriginal and non-Aboriginal (or mixed) communities—in terms of both socio-economic characteristics and the cultural understanding of "well-being"—two VCs are included in the assessment:

- **Community Well-being**, focusing on issues and concerns relevant to the broader population including non-Aboriginal (i.e., mixed) communities, such as the larger, municipal potentially affected communities (PACs); and
- **Aboriginal Community Well-being**, focusing on issues and concerns specific to Aboriginal peoples and the Aboriginal PACs.

These VCs are described further in Section 17.5.

The proposed VCs that were selected for assessment for the Project, for all subject areas, are summarized in Chapter 8. The VCs selected for inclusion in the social effects assessment are presented in Table 17.3-2, along with the indicators that will be considered in the assessment.

Table 17.3-2. Social Valued Components Selected for Assessment

Assessment Pillar	Subject Area	Valued Component	Indicator
Social	Social	Community well-being	Changes in: • number of people hired from PACs; • number of people/families using social support services; and • current capacity of health and social service providers.
		Aboriginal community well-being	

The indicator "number of people hired from PACs" was included because employment characteristics, including income, work schedule, and work environment may drive effects on well-being, including stress, substance abuse, domestic violence, family break-up, and income inequality.

Socio-economic baseline research indicated an existing challenge related to the capacity of health and social services, and effects on well-being may increase demand for these services. Therefore, the indicator "number of people/families using social support services" was included as an indicator of the potential change in demand.

The indicator "current capacity of health and social service providers" was included to contextualize (qualitatively and/or quantitatively) the ability of service providers to adequately meet the demands of the population, in terms of both the number of users and the types of services required, and manage potential changes related to well-being.

17.3.2. Defining Assessment Boundaries

Assessment boundaries define the maximum limit within which the effects assessment and supporting studies (e.g., predictive models) are conducted. Boundaries encompass where and when the Project is expected to interact with the VCs; any political, social, and economic constraints; and limitations in predicting or measuring changes. Boundaries relevant to the assessment of the potential social effects of the Project are described below and are the same boundaries described in the Socio-economic Baseline Report (Appendix 16-A).

17.3.2.1. Spatial Boundaries

Local Study Area

For the assessment of the potential effects of the Project on the social environment, the local study area (LSA) is represented by communities, as they are the most relevant to the social environment. PACs are those communities that are proximate to the Project, and/or likely to provide a portion of the Project workforce and associated goods and services. These communities may be affected by, or otherwise interact with, the Project.

Seven PACs are identified for the Project, including three Aboriginal communities (Kwadacha, Tsay Keh, and Takla Landing) and four municipalities (Mackenzie, Prince George, Smithers and Terrace). Figure 17.1-1 shows the location of the PACs in relation to the Project, as well as the RSA.

Regional Study Area

The regional study area (RSA) has been defined to characterize wider social and economic trends in the vicinity of the Project. This regional focus enables discussion of broad trends to inform the analysis of the potential social impacts of the Project. The RSA includes four administrative districts in north-central BC: the PRRD, Regional District of Fraser-Fort George (RDFFG), Regional District of Bulkley-Nechako (RDBN), and Regional District of Kitimat-Stikine (RDKS). Due to their proximity to the Project and the location of the major service centres of north-central BC, the Project expects to source labour, goods and services from communities within these regional districts.

17.3.2.2. Temporal Boundaries

Temporal boundaries, provided in Table 17.3-3, are the time periods considered in the assessment for various Project phases and activities. Temporal boundaries reflect those periods during which planned Project activities are reasonably expected to potentially affect a VC. Potential effects will be considered for each phase of the Project as described in Table 17.3-3.

Table 17.3-3. Temporal Boundaries for the Social Effects Assessment

Phase	Project Year	Length of Phase	Description of Activities
Construction	-5 to -1	5 years	Pre-construction activities and construction of surface access road and conveyor, access tunnel, declines, power supply to the underground, water lines, water treatment plants; underground lateral development and initial undercutting, and underground dewatering; ore stockpiling and ore processing start-up; and receiving environment monitoring.
Operations	1 to 13	13 years	Ramp up to commercial ore production and steady state production, TSF dam construction, underground dewatering, tailings storage, water treatment, concentrate shipping, receiving environment monitoring, and progressive reclamation.
Closure	14 to 19	6 years	Underground decommissioning and flooding; decommissioning of infrastructure at portals, process plant, admin complex, and camp facilities; reclamation, water treatment; and receiving environment monitoring.
Post-Closure	20 to 59	40 years	Removal of water treatment plant(s), underground flooding, and limited receiving environment monitoring.

17.3.2.3. Administrative and Technical Boundaries

Administrative boundaries that are relevant to the social effects assessment are based on the availability of baseline data. Socio-economic data collected for the Project, including census statistics, is generally characterized for geographical units such as a regional district, municipality, or health service delivery area. For Aboriginal communities, some data is collected for individual Indian Reserves (IRs) or distinct communities, whereas other data is characterized for the Band or First Nation (including both on- and off-reserve members). Where applicable, distinctions between these administrative boundaries are provided.

- **Regional Districts**: Four regional districts comprise the RSA (the PRRD, RDFFG, RDBN, and RDKS).
- **Municipalities**: Four of the PACs are municipalities (the District of Mackenzie, City of Prince George, Town of Smithers, and City of Terrace).
- **Indian Reserves and Aboriginal Communities:** Three of the PACs are Aboriginal communities.
  - Kwadacha is based on Fort Ware IR 1; some socio-economic data is collected for this on-reserve community, while other data is provided for the broader KwN.
  - Census data for Tsay Keh is collected for the "Indian settlement" of Ingenika Point, while other data is provided for the broader TKDN.
  - For Takla Landing, census data is collected for the North Tacla Lake IR, while other data is provided for the broader TLFN.

For the purposes of the Project (and the previously proposed Kemess North project), these three First Nations are collectively represented as the Tse Keh Nay (TKN).

These administrative boundaries are also relevant for the management of socio-economic conditions, and government service providers (e.g., Northern Health) and other agencies that operate within these boundaries.

There are also technical boundaries related to the prediction of employment and other effects. Employment predictions are based on AuRico's projections, the predictions of the BC Input-Output Model (BCIOM), as well as the past experiences of the KS Mine. The predictions of the BCIOM provide estimates of employment and expenditures for regional, provincial and national levels. These predictions are extrapolated to provide estimates for local communities based on the past experience of KS, but will ultimately depend on individual choices and decisions made by residents of these communities regarding the pursuit of employment, education, training, and business opportunities. Likewise, many potential social effects are also dependent on personal choices and preferences which cannot be accurately predicted. In these situations, the assessment has taken a conservative-but-realistic view, based on the available baseline data, input from community and Aboriginal consultation, and the experience of past projects including the KS Mine.

17.4. PROJECT SETTING

17.4.1. Regional Overview and Historical Activities

The social environment, including social development and community services, is directly and indirectly linked to the economy. BC's economy has historically relied on natural resources, which remain important economic drivers in the province, although direct employment in forestry, fishing, mining, and oil and gas declined from 3.3% in 1990 to 1.8% in 2011 (BC Stats 2012a). This has affected many communities, particularly in northern BC, whose economies depend on the natural resource sector.

Historically, resource towns were established to support mining and forestry operations. Whereas private industry was traditionally responsible for the development of supporting infrastructure and

services in resource towns, in the 1960s the provincial government financed infrastructure, roads, and railways to encourage economic development in the northern regions. Through the joint efforts of government and industry, a number of "instant towns"—including Mackenzie—were established between 1965 and 1972. The introduction of the *Instant Towns Act* (1965) provided municipal status to these towns, shifting the responsibility for urban development from the resource company to the province.

In more recent decades, mining and other projects no longer seek to establish communities to support their operations. Improved transportation options support "fly-in, fly-out" operations in remote locations, so that employees can return home between rotations. Single-industry towns still exist, and in recent years have been affected by changes to global economic conditions and fluctuating commodity prices. With less economic diversification, these communities have been less able to adapt to the changing economy, leading to population decline and changes to local employment and social conditions.

Since the mid-2000s, strong international commodity prices—especially for minerals and energy, and driven by strong growth in China and elsewhere—have rejuvenated parts of BC's resource sector industries (Statistics Canada 2013a).

17.4.2. Baseline Study Data Sources and Methods

This chapter draws on the Socio-economic Baseline Report (Appendix 16-A) which provides information about the past and present social and economic conditions and local and regional community dynamics and trends. Topics of focus include governance, population and demographics, education facilities and services, educational attainment, labour force and economy, business activity, income, housing, community health and well-being, health and social services, emergency services, and crime. The following sections provide information relevant to the social impact assessment based on the scoping exercise conducted in Section 17.3.

17.4.2.1. Data Sources

The Socio-economic Baseline Report (Appendix 16-A) is based on the review and analysis of multiple secondary sources of data including official government statistics and other provincial, regional, and local data and reports (Table 17.4-1). Mining industry reports, social science literature, public and unpublished reports, and media analyses were reviewed and considered. The results of public consultation conducted for the Project were also considered. The study was informed by reports produced for the KS Mine (1995), the previously proposed Kemess North mine (2010), and a report focusing on the Aboriginal PACs entitled "The Proposed Kemess Underground Mine: A Socio-economic Review of the Impacted Tse Keh Nay Communities" (SNC Lavalin 2013).

17.4.2.2. Methods

The socio-economic baseline data was compiled through a desk-based study and supplemented by interviews to fill data gaps. The collection of baseline information focused on generating a profile of key social characteristics for the socio-economic RSA and PACs, and included a review of existing information and statistics as well as interviews and information provided directly by the TKN First Nations.

Existing information (i.e., secondary data from publicly available sources) was compiled and analyzed, including a review of relevant published material. Information was reviewed to identify data gaps that required further study or confirmation.

The gap analysis indicated that publicly available information regarding community health and well-being was limited, particularly for the Aboriginal PACs (i.e., Takla Landing, Tsay Keh, and Kwadacha). To obtain additional information and verify available information about these communities, AuRico shared a preliminary draft version of the socio-economic baseline report with the TKN, along with a list of questions identifying topic areas for which information was limited. Written responses were received from community representatives to inform the report, including locally available statistics and reports such as the Kwadacha Human Resources Baseline Report (McCook & Case 2012).

Following a review of information provided by the TKN, interviews with health and social service providers in the Aboriginal PACs were requested in order to obtain information related to community well-being conditions, and programs and challenges at the community level. In March 2015, telephone interviews were conducted with the Directors of Health and Wellness for the KwN and TKDN. The information provided during the interviews was incorporated in the Socio-economic Baseline Report. The draft report was provided to the TKN for review and comment. The TKN provided further comments, and these comments were addressed in the final report (found in Appendix 16-A). A table identifying TKN comments and AuRico's responses was provided to the TKN in August 2015.

Sources of publicly available information used in the socio-economic baseline study are listed in Table 17.4-1.

17.4.3. Limitations

Data limitations pertinent to the content of the Socio-economic Baseline Report and social effects assessment include changes to the collection of census data and inaccuracies in the characterization of Aboriginal data.

The Census of Canada underwent substantial changes prior to the most recent round of data collection in 2011. While earlier census surveys required mandatory participation of all Canadians, many census topics (e.g., employment, education, income, housing, etc.) now rely on voluntary participation in a supplementary process called the National Household Survey (NHS), while the mandatory Census of Canada has been reduced in scope. In general, response rates for the voluntary NHS in 2011 were lower in comparison to the past Canadian censuses.

Data from the 2011 National Household Survey (Statistics Canada 2013d) should be considered with caution, particularly in making comparisons with 2006 or earlier census years. The limitations of census and NHS data are particularly noted for the Aboriginal communities of Kwadacha, Tsay Keh, and Takla Landing; due to small population size, low response rates, and local characteristics such as seasonal employment and subsistence economies, these statistics often poorly represent the actual socio-economic characteristics of these communities. Further information describing changes to the collection of census information and related implications and data limitations is provided in the Socio-economic Baseline Report (Appendix 16-A).

Table 17.4-1. Publicly Available Information and Data Sources

Topic	Indicators*	Sources
Population and Demographics	• Aboriginal identity population • Age • Gender	• Statistics Canada Census Profile (2007, 2012) • Statistics Canada National Household Survey (2013d) • Statistics Canada NHS Aboriginal Population Profiles (2013e) • Aboriginal Affairs and Northern Development Canada (AANDC): First Nation Profiles (2015b) • Regional District websites • Local government websites (e.g., municipalities, Aboriginal communities) • SNC Lavalin Report (2013)
Education, Skills Development, and Training	• Educational attainment, skill level and training • Access to education facilities and programs	• Statistics Canada Census Profile (2007, 2012) • Statistics Canada National Household Survey (2013d) • Statistics Canada NHS Aboriginal Population Profiles (2013e) • Community Research Reports (McCook & Case 2012) • School websites • Local government websites (e.g., municipalities, Aboriginal communities) • Post-secondary school websites (e.g., NWCC, CNC, UNBC) • School District 57 and 54 websites • BC Ministry of Education (2015) • SNC Lavalin Report (2013)
Labour Force & Economy, Business Activity, and Income	• Labour force characteristics • Work weeks • Occupation and industry • Seasonal employment • Local business activities • Median and average individual and household income • Sources of income	• Statistics Canada Census Profile (2007, 2012) • Statistics Canada National Household Survey (2013d) • Statistics Canada NHS Aboriginal Population Profiles (2013e) • BC Stats (BC Stats 2012b) • Regional District websites • Community Research Reports (McCook & Case 2012) • Local government websites (e.g., municipalities, Aboriginal communities) • Local business websites • SNC Lavalin Report (2013)
Housing	• Housing availability and conditions • Household tenure • Dwelling characteristics • Persons per household	• Statistics Canada Census Profile (2007, 2012) • Statistics Canada National Household Survey (2013d) • Statistics Canada NHS Aboriginal Population Profiles (2013e) • BC Stats (2014b) • BC Health Services Authority (2015) • Local government websites • SNC Lavalin Report (2013)
Emergency, Health and Social Services	• Availability of emergency services • Availability of health care facilities and services • Availability of social services	• BC Stats (2014b) Indicators of Crime, Socio-Economic Profiles • HealthLink BC (2015) • Northern Health (2011, 2012, 2014a, 2014b, 2015b) • Rural Coordination Centre of BC (2014e) • BC Ministry of Justice (BC Ministry of Justice 2012a, 2013) • SNC Lavalin Report (2013)

(continued)

Table 17.4-1. Publicly Available Information and Data Sources (completed)

Topic	Indicators*	Sources
Community Well-being	• Community well-being index • Indicators of populations' general health and well-being • Health behaviors, hospitalizations, and injury rate • Aboriginal perceptions of health and well-being • Perceptions of health • Crime rates and types • Prevalence of substance misuse	• Aboriginal Affairs and Northern Development Canada (AANDC): Community Well-Being Index (AANDC 2015a) • Community Research Reports (Littlefield 2007; McCook & Case 2012); • BC First Nations Health Authority (2015) • National Aboriginal Health Organization (NAHO 2007, 2008) • National Collaborating Centre for Aboriginal Health (NCCAH 2009, 2010) • Canadian Institute for Health Research (2011) • BC Stats (BC Stats 2012a, 2012b, 2013, 2014a, 2014b) • BC Ministry of Justice (BC Ministry of Justice 2012a, 2012b, 2013) • SNC Lavalin Report (2013)

** The availability of information varies and may not be available for all PACs.*

Statistical data describing the Aboriginal communities should be interpreted with caution and with an understanding of the limitations of this data. For these communities, census statistics and other data are limited or skewed by small populations and low response rates and are misaligned with actual socio-economic conditions. Data limitations are described in more detail in the Socio-economic Baseline Report (Appendix 16-A).

Characterization of Aboriginal PACs

The overlapping sources of baseline socio-economic information pertaining to the Aboriginal PACs are described in the Socio-economic Baseline Report (Appendix 16-A). Provided below are key points with respect to the statistical data for the Aboriginal PACs:

- KwN is based in the settlement of Kwadacha, which is alternately known as Fort Ware. Statistics Canada collects information for the "Fort Ware 1" IR (a geographic place), whereas AANDC collects data for the KwN, which is a registered Indian Band with both on- and off-reserve members.
- TKDN is based in the settlement of Tsay Keh, which is alternately known as Ingenika Point. Statistics Canada collects data for the "Ingenika Point" Indian Settlement (a geographic place) whereas AANDC collects data for the Tsay Keh Dene Nation, which is a registered Indian Band with both on- and off-reserve members.
- TLFN is based in the settlement of Takla Landing. Statistics Canada collects data for "North Tacla Lake" IR, whereas AANDC collects data for the Takla Lake First Nation, which is a registered Indian Band with both on- and off-reserve members.

As a result of the differences between Statistics Canada's geographic/settlement focus, and AANDC's focus on the broader band/cultural group, these sources of data are not directly comparable. Data sources and applicability are identified throughout this chapter.

17.4.4. Current Social Conditions

The following summary is based on the Socio-economic Baseline Report, provided in Appendix 16-A. Section 17.4.4.1 highlights socio-economic characteristics of each PAC. Further details, by subject area, are described in Sections 17.4.4.2 to 17.4.4.12 and summarized in Section 17.4.4.13.

17.4.4.1. Overview and Context

Regional Study Area

The Project is located within the PRRD, which is the largest regional district by area in the province (119,000 km^2), located south of the 58th parallel and east of the Rocky Mountains. The PRRD has a population of approximately 58,000 people including those in seven municipalities and four electoral areas[1,2]. The PRRD's economy is focused on primary industry including oil and gas, mineral exploration and mining, hydro-electric and wind power generation, forestry, and agriculture; as well as tourism and manufacturing to a lesser extent (HD Mining 2013).

The regional districts of Fraser-Fort George, Bulkley-Nechako, and Kitimat-Stikine are also within the socio-economic RSA:

- Regional District of Fraser-Fort George (RDFFG) includes approximately 100,000 people within four municipalities and seven electoral areas (Statistics Canada 2013d).[3]
- Regional District of Bulkley-Nechako (RDBN) includes approximately 39,000 residents within eight municipalities and seven electoral areas (Statistics Canada 2013d).[4] The RDBN economy is focused on forestry, mining, agriculture, and tourism industries (RDBN 2014).
- Regional District of Kitimat-Stikine (RDKS) includes approximately 37,000 residents within five municipalities and seven electoral areas[5] (Statistics Canada 2013d) within an area of 100,000 km^2 in northwestern BC. The RDKS economy is focused on mining, forestry, fishing, and transportation industries (RDKS 2014).

Potentially Affected Communities (PACs)

Seven PACs have been identified for the assessment based on their proximity to the Project, likely sources of workers, goods and services, and the extent of Aboriginal traditional territories; these communities are Kwadacha, Tsay Keh, Takla Landing, Mackenzie, Prince George, Smithers, and

[1] "Electoral areas" are rural areas outside of municipal boundaries, and can cover vast areas with low population density. Regional districts are typically subdivided into municipalities and electoral areas.

[2] The PRRD includes the cities of Fort St. John and Dawson Creek, the district municipalities of Tumbler Ridge, Chetwynd, Taylor, and Hudson's Hope, and the village of Pouce Coupe. The regional district electoral areas are B, C, D, and E.

[3] The RDFFG includes the city of Prince George, the district municipality of Mackenzie, and the villages of McBride and Valemount. The regional district electoral areas are A, C, D, E, F, G, and H.

[4] The RDBN includes the town of Smithers, the district municipalities of Houston, Vanderhoof, and Fort St. James, and the villages of Burns Lake, Fraser Lake, Telkwa, and Granisle. The regional district electoral areas are A, B, C, D, E, F, and G.

[5] The RDKS includes the city of Terrace, the district municipalities of Kitimat, Stewart, and New Hazelton, and the village of Hazelton. The regional district electoral areas are A, B, C (Part 1), C (Part 2), D, E, and F.

Terrace. Kwadacha, Tsay Keh, and Takla Landing are remote and predominately Aboriginal communities. There is a high proportion of Aboriginal persons throughout the RSA. Approximately one fifth of residents of Terrace, and one tenth of the population residing in Mackenzie, Prince George, and Smithers, self-identified as Aboriginal in 2011. Members of the KwN, TKDN, and TLFN are known to reside in other communities including Prince George, Mackenzie, Smithers, and Terrace, and often relocate to larger communities in pursuit of employment, education, training, and business opportunities.

A brief overview of each PAC is provided in Table 17.4-2. The nearest community to the Project is Kwadacha (79 km, straight-line distance). A map of the study areas including PACs is provided in Figure 17.1-1.

Table 17.4-2. Overview of Potentially Affected Communities

Community	Located in	Notes
Aboriginal PACs		
Kwadacha	Peace River Regional District	KwN's main reserve community is Fort Ware IR 1, commonly referred to as Kwadacha, which is located 459 km from the Project by road. The KwN had on-reserve population of 296 in September 2015 (AANDC 2015b). The community is accessible by air or by the Finlay Forest Service Road (FSR) from Mackenzie/Highway 97. The KwN is a part of the Kaska Dene cultural group represented by the Kaska Dene Council.
Tsay Keh	Peace River Regional District	The main reserve community of the TKDN is Tsay Keh (alternately known as Ingenika Point Indian Settlement). Tsay Keh had a population of 218 in September 2015 (AANDC 2015b) and is 386 km from the Project by road. The community is accessible by air or by the Finlay FSR from Mackenzie/Highway 97.
Takla Landing	Bulkley-Nechako Regional District	The main reserve community of the TLFN is Takla Landing (alternately known as North Tacla Lake IR 7/7A). TLFN is member nation of the Carrier Sekani Tribal Council. Takla Landing had an on-reserve population of 397 in September 2015 (AANDC 2015b) and is 473 km from the Project by road. The community is accessible by air (water or ice landing) or by several FSRs from Fort St James.
Municipal PACs		
Mackenzie	Fraser-Fort George Regional District	The District of Mackenzie is a municipality comprising the township of Mackenzie and surrounding area of 155 ha. It is 414 km from the Project by road. Mackenzie had a population of approximately 3,500 in 2011 (Statistics Canada 2012).
Prince George	Fraser-Fort George Regional District	The City of Prince George is the largest city and service centre in northern BC. Prince George had a population of approximately 72,000 in 2011 (Statistics Canada 2012) and is 538 km from the Project by road.
Smithers	Bulkley-Nechako Regional District	The Town of Smithers is a service centre for the mining industry and other regional services (e.g., health, education, retail). It is the closest community to the Project by air, although the distance by road is longer. Smithers is located 907 km from the Project by road and had a population of approximately 5,400 in 2011 (Statistics Canada 2012).

(continued)

Table 17.4-2. Overview of Potentially Affected Communities (completed)

Community	Located in	Notes
Municipal PACs *(cont'd)*		
Terrace	Kitimat-Stikine Regional District	The City of Terrace is a service centre for the mining industry and other regional services (e.g., health, education, retail). Terrace had a population of approximately 11,500 in 2011 (Statistics Canada 2012) and is 1,112 km from the Project by road.

Note: Population estimates are based on the 2011 Census of Canada (Statistics Canada 2013d), and AANDC First Nations Profiles (AANDC 2015b).

Kwadacha

Kwadacha is located approximately 450 km northwest of Mackenzie and 580 km northwest of Prince George by road. Land travel between Kwadacha and Mackenzie is via the unpaved Finlay FSR; 4x4 or heavy duty vehicles are recommended for the 410-km journey along the FSR (BC Curios 2014). Travel time from Kwadacha to Prince George by road is 10 to 12 hours, depending on road and weather conditions. The Finlay FSR also connects Kwadacha to Tsay Key, approximately 80 km to the southeast. Kwadacha may also be reached by a one-hour flight from Prince George, and scheduled charter flights are arranged by the KwN three times per week. Telephone and internet service relies on satellite connection; household internet connections are noted to be low speed (i.e. below 1.5 Mb/s; AANDC 2013a).

Located 79 km (straight-line distance) from the Project, Kwadacha is the nearest of the PACs. It is home to the KwN. Local employment is often seasonal and typically based on the resource industry, and some community members continue to participate in and rely on subsistence harvesting (Littlefield 2007). The community is located at the confluence of the Fox, Kwadacha, and Finlay rivers in the Rocky Mountain Trench.

The Kwadacha community has a community-owned store, a café, a nine-bedroom motel (Motel 9), eight rooms of accommodation at The Whitehouse, and a church (Kwadacha Nation 2015). The local school provides education to students from kindergarten to grade 12. A new health centre opened in 2013. It provides basic services; urgent or more complex medical needs require transfer to hospitals in Mackenzie or Prince George. There are no ambulance or firefighting resources in the community.

Tsay Keh

The community of Tsay Keh is located at the north end of the Williston Reservoir approximately 350 km northwest of Mackenzie and 520 km northwest of Prince George (Littlefield 2007), and 111 km (straight-line distance) from the Project. Land travel between Tsay Keh and Mackenzie is via the unpaved Finlay FSR; 4x4 or heavy duty vehicles are recommended for the 330 -m journey along the FSR. The Finlay FSR also connects the community to Kwadacha (80 km to the northwest). Tsay Keh is accessible by air from Prince George, with a flight time of approximately one hour; the TKDN arranges scheduled charter flights three times per week. Flights are organized through Ootsa Air, of which TKD is part owner through TKD's Economic Development Corporation. Travel time by road from Prince George to Tsay Keh is 8 to 10 hours depending on road and weather conditions. Telephone and internet service relies on satellite connection; household internet connections are noted to be low speed (below 1.5 Mb/s).

Tsay Keh is the main community for TKDN. Approximately half of TKDN members reside in Tsay Keh. Residents primarily live on settlement lands rather than reserve lands, as the original reserve communities (and part of the Tsay Keh Dene traditional territory) were flooded and relocated in the 1960s as a result of the development of the W.A.C. Bennett Dam and the creation of the Williston Reservoir (TKD 2006). The affected area included homes at Fort Grahame, Finlay Forks, Pine Creek, and Ingenika. In 2010, Tsay Keh Dene reached a final settlement with the province and BC Hydro regarding claims related to the dam and reservoir (BC Hydro Power Authority & Fasken Martineau 2012). Despite the community's proximity to the dam, the hydroelectric facility does not supply power to Kwadacha (TKD 2006). However, Tsay Keh was recently included in BC Hydro's initiative to implement modular diesel generating stations in the community as part of the *Remote Community Electricity (RCE) Program* (Canadian Electricity Association 2014).

The Tsay Keh community includes a local school providing education for students from kindergarten up to grade twelve. Adults can pursue an adult curriculum to receive a high school certificate at Tsay Keh's Learning Centre, which provides teachers through an agreement with the TKD-funded College of New Caledonia. The local health centre provides basic health services and a broad spectrum of programming related to community health and well-being. Patients with more serious health needs are transferred to hospitals in Mackenzie or Prince George. Tsay Keh has a local ambulance and a volunteer fire department. Groceries and other supplies are available locally through the Ingenika Trading Post, which also coordinates postal deliveries. The TKDN has a number of initiatives supporting employment and training opportunities for its members, including those in the mining and forestry sectors.

Takla Landing

On the eastern shore of Takla Lake, Takla Landing is located approximately 315 km northwest of Mackenzie and 440 km northwest of Prince George; the community is 182 km south of the Project (straight-line distance). Takla Landing is accessible from Fort St. James via a combination of Tachie Road (paved, approximately 50 km) and the Leo Creek and Driftwood FSRs (unpaved, approximately 150 km). The route is not always well maintained and can be impassible during winter snows. Travel time from Prince George to Takla Landing is approximately seven hours by road.

Takla Landing is home to the TLFN, which comprises members of the former Fort Connelly First Nation and North Takla Lake Band. Takla Landing includes North Tacla Lake Indian Reserves Nos. 7 and 7A, as well as the Takla ferry landing on the south end of the community. Electricity is provided through the provincial electricity grid operated by BC Hydro (NovaTec Consultants Inc. 1989); however, service can be unreliable and result in power outages (SNC Lavalin 2013). Telephone and internet service in the community relies on satellite connection (AANDC 2013b).

Local supplies are available at the Takla Trading Post, which also includes a motel, gas station and restaurant. The local school provides education up to grade 9, and students typically pursue grades 10 to 12 in Fort St James or Prince George. The community's health centre provides basic services and receives monthly visits from a doctor; the health centre has also been the subject of a successful tele-health pilot project which provides continuing physician services via video conferences. Patients requiring urgent and more complex medical treatment are transferred to hospitals in Prince George or Fort St James. There are no ambulance or firefighting resources in the community. Local residents

are primarily employed by the First Nation, the Takla Trading Post, Takla Development Corporation, and resource development companies operating in the area.

Mackenzie

Mackenzie was originally settled in the 1960s alongside the construction of the W.A.C. Bennett Dam and in conjunction with two sawmills that supported the development of the area's vast forest resources (Mackenzie 2014). However, settlement in the area dates back to some of the earliest trading posts in the province: the Northwest Company and Aboriginal people and trappers were active in the area in the early 1800s, and the Hudson's Bay Company arrived in the 1820s and established many successful trading posts (Mackenzie 2014).

Located on Highway 39, the town is 184 km northwest of Prince George, 552 km northeast of Smithers (by road), and 297 km southeast of the Project (straight-line distance). The District of Mackenzie includes the main township and surrounding 155 ha area.

Major industries in the Mackenzie area include forestry and forest products, and mining. Mackenzie was, in many ways, founded as single-industry town dependent on forestry and has subsequently had a turbulent economic history that can be characterized as "boom-and-bust"; the last notable "bust" in 2008 resulted in the loss of 1,800 jobs (Crosby. B. 2010).

Prince George

Prince George was incorporated in 1914 (City of Prince George 2014a) and is situated at the crossroads of highways 16 (east-west) and 97 (north-south) and at the confluence of the Fraser and Nechako rivers. The largest city in northern BC and known as BC's northern capital, Prince George is 538 km from the Project by road (434 km straight-line distance).

Prince George's economy is centered on forestry and forest product manufacturing, and the community has 12 sawmills and three pulp mills. Other industry in the area includes two chemical plants, an oil refinery, brewery, dairy, machine shops, aluminum boat building, log-home construction, value-added forestry products, and speciality equipment manufacturing (City of Prince George 2014a).

As the largest city and primary service centre for northern BC, Prince George offers a diverse array of facilities and services that are used by the broader region. The University of Northern BC provides a wide range of degree programs, including graduate studies, medical school, and diplomas and certificates specific to the needs of rural and Aboriginal communities. The University Hospital serves patients throughout northern BC, and includes extensive acute care and specialized health services. Prince George is also a hub for transportation, including air travel through the regional airport.

Smithers

Smithers is located on Highway 16. It is 369 km northwest of Prince George and 205 km northeast of Terrace by road. The town is located 255 km from the Project (straight-line distance), and over 900 km by road. Established in 1916 along the Grand Trunk Pacific Railway, Smithers' economy has

benefitted from primary industry, specifically mining, agriculture, and forestry; this is a trend that has continued today (Town of Smithers 2014).

The Smithers airport is a hub for regional travel and is often used for industry charter flights to mining properties throughout northwest BC. Smithers is also home to the School of Exploration & Mining at the Northwest Community College (NWCC); this program offers industry-specific training designed to support the needs of the mining industry and prepare students for work at regional operations and exploration sites. Program areas include drilling, prospecting, environmental monitoring, forestry, mineral processing, and camp operations. More than 70% of the school's graduates to date have been Aboriginal (NWCC 2015).

Terrace

Terrace is situated on a key freight corridor at the junction of three highways: Highway 16 (the Yellowhead Highway), Highway 37 (the Stewart-Cassiar Highway), and Highway 113 (the Nisga'a Highway). The city is located 307 km from the Project (straight-line distance) and over 1,100 km by road.

A sawmill community incorporated in 1927, Terrace is now a regional service hub and business centre. The community began to grow in the 1950s as it became an important wood-processing centre and served as a distribution centre for the neighbouring town of Kitimat (City of Terrace 2014). The population of Terrace has grown from 350 in 1951 to approximately 11,500 in 2011 (Statistics Canada 2012, 2013d; City of Terrace 2014).

As a regional service centre, Terrace is the base for the NWCC, which has campuses throughout northwestern BC. Next to the University Hospital in Prince George, Terrace's Mills Memorial Hospital provides the largest number of physician and specialist services in northern BC (RCCBC 2015).

17.4.4.2. Population and Demographics

The population of British Columbia was approximately 4.4 million people in 2011, a 7.0% increase from 2006. Approximately 5% of the provincial population identifies as Aboriginal (Statistics Canada 2013d).

Regional Study Area

The PRRD is the second most populous regional district in the socio-economic RSA with 60,082 residents in 2011 (26% of the RSA population), of which 14% were people of Aboriginal identity. This represented an increase in total population of 3.4% from 2006 – the largest growth in the RSA during that period (Statistics Canada 2013d).

The RDFFG is the most populous regional district in the RSA, with over 40% of the RSA population; 12% of people identified as Aboriginal. RDFFG's population decreased by 0.4% between 2006 and 2011, settling at 91,897 in 2011 (Statistics Canada 2013d).

The RDBN had a population of 39,208 in 2011 (2.5% increase from 2006) with 19% of people reporting Aboriginal identity (Statistics Canada 2013d). The population was stable during the period

1986 to 2013. The RDKS is the least populous in the RSA and had the highest proportion of Aboriginal people (33%; Statistics Canada 2013d).

In 2011, residents in the RSA were younger, on average, compared to the province. The population of the PRRD was the youngest in the RSA with a median age of 34.3, whereas the population of the RDKS had the highest median age in the RSA at 40.3 (Statistics Canada 2013d).

Potentially Affected Communities

Kwadacha, Tsay Keh, and Takla Landing

Populations of the Aboriginal PACs ranged from approximately 240 in Tsay Keh to approximately 430 in Takla Landing (AANDC 2015b). Takla Landing had the highest population growth rate (40%) between 2006 and 2011; however, the census boundaries changed during this time so this estimate may be inaccurate. Tsay Keh and Kwadacha also grew, but their growth rates were below the provincial rate of 7%. In these communities, nearly 100% of residents self-identified as Aboriginal (Table 17.4-3).

Table 17.4-3. Summary of Aboriginal PAC Demographics

	Kwadacha	Tsay Keh	Takla Landing
Population 2015[1]	296	218	397
Population 2011	250	n/a[2]	183
Population Growth (2006 to 2011)	4.6%	n/a[2]	40%
Aboriginal Identity	100%	95%	97%
Median Age	27 years	26 years	30 years
Population under 15	32%	33%	27%
Population over 65	6%	5%	8%

Source: Statistics Canada (2012) unless otherwise identified
Notes:
[1] Source: AANDC (2015) – population reported as of Sept 2015.
[2] Tsay Keh representatives have indicated that Statistics Canada population data does not accurately reflect the population. The TKDN reported 239 community residents in December 2014 (L. Gleeson, pers. comm.)

The median ages in these communities range from 26 to 30 years (compared to the provincial median of 42 years) and nearly one-third of the population is under the age of 15. Five to eight percent of residents were over 65 years of age, compared to 15% of the province; this may indicate that elders relocate to larger centres for health care or other reasons.

Mackenzie, Prince George, Smithers, and Terrace

The other PACs range in size from relatively small (Mackenzie and Smithers) to the largest city in northern BC (Prince George). All communities experienced minor growth between 2006 and 2011, with the exception of Mackenzie which declined by more than 20%.

Although these municipal communities are described, in this chapter, separately from the "Aboriginal" PACs, it is important to note that they all have Aboriginal populations ranging from 11% in Smithers to 21% in Terrace, compared to the provincial average of approximately 5% (Table 17.4-4).

Table 17.4-4. Summary of Municipal PAC Demographics

	Mackenzie	Prince George	Smithers	Terrace
Population 2011	3,507	71,974	5,404	11,486
Population Growth (2006 to 2011)	-23%	1%	4%	2%
Aboriginal Identity	12%	13%	11%	21%
Median Age	43 years	38 years	37 years	39 years
Population under 15	17%	18%	21%	20%
Population over 65	9%	12%	13%	13%

Source: Statistics Canada (2012)

In the municipal PACs, population structure and median ages more closely resembled provincial averages. The population of the Mackenzie had a median age of approximately 43 compared to the provincial average of 42, making it the oldest community among PACs. In these communities, Youth (under the age of 15) represented 17 to 21% of the population, slightly above the provincial rate of 15% (Statistics Canada 2012).

17.4.4.3. Education Facilities and Programs

Primary education is available in all of the Aboriginal PACs, although students may need to travel to neighbouring communities to finish high school. Kwadacha offers on-reserve education from kindergarten to grade 12. In Tsay Keh, the local school provides kindergarten to grade 12 classes. Takla Landing also offers up to grade 9, and students typically transfer to Fort St James or Prince George for grades 10 to 12. In all of the Aboriginal PACs, the local schools provide language and cultural education as well as the standard provincial curriculum. Adult education opportunities (e.g. high school equivalency) are also available. Primary and secondary education is available in Mackenzie, Prince George, Smithers, and Terrace (Table 17.4-5).

Table 17.4-5. Education and Training Facilities

	Primary	High School	Post-Secondary	Training, Other
Kwadacha	Yes	Yes	No	Yes
Tsay Keh	Yes	Online/Other	No	Yes
Takla Landing	Yes	Online/Other	No	Yes
Mackenzie	Yes	Yes	Yes	Yes
Prince George	Yes	Yes	Yes	Yes
Smithers	Yes	Yes	Yes	Yes
Terrace	Yes	Yes	Yes	Yes

There is a range of adult education, post-secondary programs, and skills training opportunities throughout the RSA, although distribution and access is uneven due to challenges of geography and distance. The most abundant resources are concentrated in Prince George, Smithers, and Terrace. For example, the College of New Caledonia (CNC) has campuses in Prince George and Mackenzie; the Northwest Community College (NWCC) has campuses in Smithers and Terrace; the University

of Northern BC (UNBC) in Prince George also has a campus in Terrace. In addition, several independent and/or First Nations-run training or post-secondary institutions offer high school equivalency, industrial/technical and other specialty programs.

Each of the Aboriginal PACs provides funding to students attending post-secondary schools outside of the community and offer adult education or employment training programs. For example, short courses offered in Kwadacha include First Aid, FoodSafe, driver's education, and safety courses (Kwadacha Nation 2014). Educational programming in Tsay Keh includes high school equivalency, adult education, first aid, swiftwater rescue, environmental monitoring certification, and driver's education (L. Gleeson, pers. comm. 2014), and TLFN employs an employment and training network coordinator for members (PGNAETA 2014).

The CNC offers post-secondary education in Mackenzie, as well as online and distance education, including applied business technology, college and career preparation, and trades and technical programs (CNC 2014a). The CNC campus at Mackenzie works with Aboriginal groups (including the KwN and the TKDN) to offer courses such as college and career preparation, computer training, entrepreneur training, first aid, child care, driver training, safety training, and forestry courses (CNC 2014c).

Several institutions in Prince George offer post-secondary education including two campuses of the CNC and the UNBC (LearnLiveBC 2014). The CNC offers programs in business, health sciences, and trades (CNC 2014b) and works closely with the natural resources sector (CNC 2013). Also in Prince George, the UNBC offers undergraduate and graduate degree programs (UNBC 2014b). The university has a dedicated First Nations Centre, which supports First Nations students from small rural communities (UNBC 2014a).

The NWCC was first established in Terrace and now operates campuses in communities across the northwest (NWCC 2014a). The NWCC has a strong vocational, trades, and technical focus. Regular NWCC programming includes special education assistant training, workplace skills training, career and college preparation, continuing education, university credit, and nursing. The campus provides both on-line and in-class courses (NWCC 2014a). UNBC also has a campus in Terrace (UNBC 2010).

The NWCC also operates a campus in Smithers (NWCC 2014b) and partners with School District 54 for training and post-secondary initiatives. In recent years, related initiatives have been more focused on providing access to trades training (School District No. 54 (Bulkley Valley) 2014). Smithers is also home to the NWCC School of Exploration & Mining, which offers courses designed to meet the training needs of the mining industry (NWCC 2014b).

17.4.4.4. Educational Attainment

Educational attainment levels vary between the PACs, with a notable difference in educational attainment between residents of the smaller and more rural Aboriginal communities, compared with the larger centres (Statistics Canada 2013d).

Kwadacha, Tsay Keh, and Takla Landing

Lower-than-average high-school completion rates in many northern communities are often correlated with a past (and current) lack of access to formal education. Within the Aboriginal PACs

in 2011, approximately three-quarters of the population over 15 years of age had not completed a high school education (65% in Takla Landing, 75% in Kwadacha, and 79% in Tsay Keh) and less than one fifth had a post-secondary education (19% in Takla Landing, 14% in Tsay Keh, and 9% in Kwadacha). Of those with post-secondary education, trades-related studies were common; of the 19% of Takla Landing residents with post-secondary education, 60% (or around 15 people) hold apprenticeship or trades certificates or diplomas. Additionally, a 2012 survey indicated that approximately 5% of KwN members hold technical certificates (McCook & Case 2012).

Limited information regarding fields of post-secondary studies is available for the Aboriginal PACs. A recent report of the KwN (McCook & Case 2012) indicated that three community members completed a heavy equipment operator course in 2014, while census data for Takla Landing indicates that studies related to health and engineering are the main areas of study amongst local residents (Statistics Canada 2013d).

Mackenzie, Prince George, Smithers, Terrace

Educational attainment in Mackenzie, Prince George, Smithers, and Terrace in 2011 differed from the Aboriginal PACs. Approximately one quarter of the population aged 15 and over did not have a high school education (23%, 21%, 23%, and 24%, respectively); although nearly half had some form of post-secondary studies (47%, 48%, and 44% and 50%). Of those with post-secondary training, the portion with apprenticeship or trades certifications range from approximately one quarter in Smithers, Terrace, and Prince George (26%, 25%, and 28%, respectively) to 37% in Mackenzie.

Major fields of study in Mackenzie, Prince George, Smithers, and Terrace in 2011 included architecture, engineering, and related technologies as well as business management and public administration.

17.4.4.5. Economy, Labour Force, and Income

In 2012, BC's economy contributed 12.1% of Canada's GDP (BC Stats 2013). In 2013, the dominant employment industries in BC included trade (16.0%); health care and social assistance (11.4%); professional and technical services (8.0%); education services (7.6%); and accommodation and food services (7.5%; BC Stats 2014a). In 2013, the goods sector provided one in five jobs (19.3%; BC Stats 2014b) and mining, quarrying, and oil and gas extraction accounted for 4.1% of BCs GDP (Statistics Canada 2014).

The 2011 annual median and average incomes in BC were $28,765 and $39,415, respectively, with men earning higher incomes than women. The median and average household incomes were $60,333 and $77,378, respectively. Median and average individual employment incomes in BC were $49,143 and $58,016, respectively (Statistics Canada 2013d).

Regional Study Area

Participation rates in the socio-economic RSA ranged from 69 to 75% in 2011. The PRRD has the highest participation rate (75%) and the RDKS had the lowest (62%). Unemployment rates in the RSA were higher (10 to 12%) in comparison to the provincial average of 7.8% with the exception of the PRRD (6.4%). The total labour force in the RSA was approximately 125,490 people in 2011; 9.5% were unemployed (Statistics Canada 2013d).

The main occupations in the RSA included sales and services, and trades, transport and equipment operators. However, occupations in the natural resource industries, manufacturing, and trades and transportation were more common in the RSA compared to the provincial averages. Within the RSA, most employed people worked full time (71 to 80%) in 2010, similar to the provincial average (73%).

The PRRD had the highest median and average employment incomes for individual ($36,538 and $46,218) as well as the highest median and average incomes for households ($76,982 and $88,313). Incomes were lowest in the RDKS. On average, the median and average income for females was lower as compared to males, with discrepancies as high as 50% in some jurisdictions (e.g., RDBN).

Potentially Affected Communities

The total labour force within the PACs represented 2.2% of the provincial labour force in 2011. Of that, Takla Landing, Tsay Keh, and Kwadacha had a combined labour force of approximately 200 people (Statistics Canada 2013d). Combined, there were approximately 4,870 individuals unemployed in the PACs in 2011.

Kwadacha, Tsay Keh, and Takla Landing

Labour force participation rates in Kwadacha (46%), Tsay Keh (60%), and Takla Landing (58%) were below the provincial rate (65%). Unemployment rates were higher than average (approximately 22% to 27%) relative to both provincial (7.8%) and regional averages (i.e., 6.4% in the PRRD, 10.0% in the RDFFG, 10.5% in RDNB, and 12.9% in RDKS).

Seasonal and short-term employment is reported to be common in the Aboriginal PACs, and likely related to seasonal cycles of natural resource industries (S. Case 2014; L. Gleeson 2014, and SNC Lavalin 2013). Notably, the proportion of workers employed for one to 13 weeks, and 14 to 26 weeks, was higher in the Aboriginal communities in comparison to the larger PACs and the provincial averages.

Of those employed in 2011, the dominating occupations in Kwadacha, Tsay Keh and Takla Landing were in natural resources, agriculture and related production (27.8%); sales and services (22.2%); education, law and social, community and government services (16.7%); and, trades, transport and equipment operators and related occupations (13.9%).

Income data was unavailable for Tsay Keh and Takla Landing. Incomes in Kwadacha were lower than provincial averages overall. In 2010, the average annual income of individuals in Kwadacha was $24,902 (provincial average $39,415), and the average household income was $52,403 (provincial average $77,378). The median annual income in Kwadacha was $11,394, and the discrepancy between the median and the higher average ($24,902) indicates an income disparity within the community, where there are a number of households with lower incomes at the lower end of the income spectrum, and fewer households with notably higher income.

Mackenzie, Prince George, Smithers, Terrace

Labour force participation rates in Mackenzie, Prince George, Smithers and Terrace in 2011 were equal to or higher than the provincial rate (65%) at 69%, 72%, 65% and 65%, respectively. Unemployment rates were in line with the provincial average and varied from a low of 7.8% in Smithers and Terrace to a high of 9.9% in Prince George.

In Mackenzie, Prince George, Smithers, and Terrace most occupations were in sales and service (24.2%); trades, transport and equipment operators and related occupations (18.7%); and, business, finance and administration (14.4%).

Median and average individual incomes were fairly similar among the municipal PACs. The median ranged from approximately $30,000 to $32,000 and the average ranged from $37,000 to $40,000 annually. Median and average household incomes were highest in Terrace ($75,844 and $84,322) and lowest in Mackenzie ($57,094 and $67,519).

17.4.4.6. Industry and Business

Regional Study Area

Economic activity in the socio-economic RSA is centered on natural resources, including mining, forestry agriculture and tourism. Mining and forestry are common economic drivers within the RSA. Other economic drivers include agriculture in the PRRD and RDBN; tourism in the RDFFG and RDBN; and energy in the RDKS, PRRD and RDFFG, among others (Invest in North Central BC 2014; Invest in Northeast BC 2014; Invest in Northwest BC 2014).

As the home of both the W.A.C. Bennett and Peace Canyon dams, the PRRD produces 38% of BC's hydroelectric power and also has some of the largest gas fields in North America, with rapidly expanding oil and gas exploration and production (NPEDC 2014). The region also produces the majority of BC's canola and grain harvests, and has experienced increased tourism in the past few years (Invest in Northeast BC 2014).

Manufacturing, wholesale, and retail industries accounted for almost one quarter of employment in the RSA in 2011 (PRRD, 19%; RDFFG, 24%; RDBN, 26%; and RDKS, 23%). The construction industry was also a notable employer in 2011, accounting for approximately 9% of employment within the RSA. Mining, quarrying, and oil and gas extraction accounted for 1% of employment in the PRRD, the regional district in which the Project is located, and 5% of employment in the RSA overall.

Potentially Affected Communities

Kwadacha, Tsay Keh, and Takla Landing

The "agriculture, forestry, fishing and hunting" sector is particularly important for employment in the Aboriginal communities, especially for Kwadacha (13% of total employment) and Tsay Keh (22%) with rates of employment in this sector notably above the provincial average (3%). Public administration and health care work also provide employment (Statistics Canada 2013d). Although no residents reported work in the mining industry in the 2011 census, AuRico notes there were 40 TKN members[6] employed in relation to the Kemess site in 2013/14, and approximately 34 in 2014/15. Additional TKN members were employed in relation to the site on a contract basis in 2015.

[6] AuRico reports that in 2013, 17 TKN members were employed during mineral exploration at the Project site, and two were employed as seasonal environmental monitors at KS. In 2014, there were 21 TKN members employed during exploration

Kwadacha, Tsay Keh, and Takla Landing also employ people through band-operated businesses. In Kwadacha, this includes a number of businesses such as Kwadacha Natural Resources LP (contracting to support primary industry) and Kwadacha Outfitters (outdoors and tourism services). The KwN has also established a business harvesting traditional herbal teas for sale online. Similarly, TKDN owns and operates the Ingenika Trading Post, and the TLFN operates the Takla Trading Post (TTP or Takla Lodge) which consists of a small general store, a restaurant and accommodation (13 rooms).

The Tsay Keh Economic Development Corporation houses a number of TKDN-based businesses, including Chu Cho Industries LP (an earthworks and transportation contractor), Chu Cho Environmental, Chu Cho Forestry, Tsay Keh Dene Outfitters, and others. In 2014, Chu Cho Industries LP received the "community-owned business of the year" award as part of the BC Aboriginal Business Awards (BC Achievement Foundation 2014).

Mackenzie, Prince George, Smithers, Terrace

Industrial and business activities within Mackenzie, Prince George, Smithers, and Terrace are varied and diverse. In Mackenzie, forestry remains the primary economic driver, though tourism and outdoor recreation are also of importance (RCCBC 2014e). There are several pellet mills, sawmills, and pulp and paper mills in the region as well as existing and developing mining projects (IPGED 2014). Transportation services in Mackenzie include Northern Thunderbird Air, Pacific Western Helicopters and Yellowhead Helicopters.

Prince George, Smithers and Terrace are relatively diversified communities with a range of businesses including shopping malls, grocery stores, retail stores, gas stations, restaurants, health services, and wholesale trade. Several businesses in Terrace and Smithers supply the mining industry with a wide range of support services and materials (Invest in Northwest BC 2011).

17.4.4.7. Housing

Housing demand in northern BC is historically linked to resource development activities (e.g., mining, hydroelectric development, and forestry). The increased economic activity and employment prospects associated with the development of large projects may influence other economic sectors and increase demand for local housing. At times, the perception of upcoming development has been linked to real changes in housing demand, which can also lead to increases in housing costs.

Regional Study Area

As indicated by the 2011 Census, nearly all (84 to 91%) housing in the RSA was in good repair, requiring only regular maintenance or minor repair and the average number of persons per household (2.5) indicated housing conditions were not overcrowded (Statistics Canada 2013d). The proportion of homes requiring major repair was slightly higher in comparison to the provincial average of 7% (ranging from a low of 9% in RDFFG to a high of 16% in RDKS). Approximately three quarters of RSA residents owned their own homes.

In 2011, an estimated 79% of owner-occupied households in the socio-economic RSA were affordable[7]; this is approximately 10% above the provincial average, indicating a relatively high level of affordability compared to the province (Statistics Canada 2013d). Amongst tenant households, 65% reported affordable housing costs, and 11% of all tenants lived in subsidised housing (Statistics Canada 2013d).

Potentially Affected Communities

Within the Aboriginal PACs, there are more persons per household relative to Mackenzie, Prince George, Smithers and Terrace. Overall, housing in the PACs is generally affordable, but less so for those who rent. Approximately half of the dwellings in Kwadacha and 40% in Takla Landing were reported to require major repair in 2011 (Table 17.4-6). In Takla Landing, poor housing conditions and overcrowding, as reported for approximately half of local dwellings, require some community members to reside elsewhere during the winter (SNC Lavalin 2013). Approximately 5 to 10% of homes in the municipal PACs require major repair (Statistics Canada 2013d). Table 17.4-6 characterizes certain aspects of housing in the PACs as reported in May 2011, and does not provide context as to seasonal variations in residence.

Table 17.4-6. Housing in the PACs, 2011[1]

Community[2]	Total Occupied Dwellings[2]	Total Number of Persons in Private Households	Dwelling Characteristics		Two-or-More Family Households	Average Number of Persons per Household
			Regular Maintenance or Minor Repair	Major Repairs Needed		
Kwadacha	75	250	47%	53%	0%	3.3
Tsay Keh[3]	100	247	-	-	-	2.5
Takla Landing	55	180	42%	50%	0%	3.1
Mackenzie	1,565	3,290	89%	11%	1%	2.3
Prince George	29,260	70,790	92%	8%	2%	2.4
Smithers	2,190	5,335	95%	5%	1%	2.4
Terrace	4,535	11,305	90%	10%	2%	2.5

Sources: Statistics Canada (2013d); Gleeson (pers. comm., 2014)
Notes:
[1] Percentages may not equal 100% due to random rounding techniques employed by Statistics Canada.
[2] Statistics Canada defines Occupied Dwellings as those in which people reside at the time of data collection.
[3] Housing data for Tsay Keh has been provided by the TKDN (L. Gleeson, pers. comm., 2014).

17.4.4.8. Health Status

Data describing health status is collected for Local Health Areas (LHAs) which often include more than one community. Health status data indicate the average of a group within this larger area and is not necessarily representative of each community within an LHA. As a result, the health status

[7] Statistics Canada considers housing to be "affordable" when less than 30% of household income is spent on housing costs.

data of LHA may not accurately reflect health in the smaller Aboriginal PACs, although it may be more representative of the larger population centres.

The Prince George LHA includes Prince George, Mackenzie, McBride, Valemount, and surrounding areas. Life expectancy in Prince George LHA is 79.8 years, slightly below the provincial average of 82.3 years. In the Prince George LHA, the potential years of life lost (PYLL) from natural causes was above the provincial rate. Overall, PYLL due to natural causes, accidental causes, and suicides/ homicides in Prince George LHA is similar to the province (BC Stats 2012c). The infant mortality rates and rates of hospitalization for respiratory disease as well as for injury and poisoning were slightly higher in the Prince George LHA in comparison to provincial averages (BC Stats 2012c).

The Smithers LHA includes Smithers, Telkwa, Houston, and surrounding areas. Life expectancy in the Smithers LHA is lower than the provincial average. In the Smithers LHA, the PYLL from natural causes, accidental causes, and from suicide/homicide were slightly higher than the provincial averages (BC Stats 2012d). The infant mortality rate was below the provincial rate, while youth (up to 14 years of age) hospitalization rates for respiratory disease almost equal to the provincial average. Hospitalization due to injury and poisoning in the Smithers LHA were three times the provincial average (BC Stats 2012d).

The Terrace LHA includes Terrace and surrounding areas. Health indicators in Terrace fall below the provincial averages for life expectancy at birth and PYLL from natural and accidental causes, suicides, and homicide. PYLL due to natural causes in the Terrace LHA is almost double the provincial average, PYLL due to accidental causes is more than double, and the PYLL due to suicides and homicides is slightly more than double, as compared to the provincial figures for each (BC Stats 2012e). Similarly, the infant mortality rate in the Terrace LHA was higher than the provincial rate. Hospitalization rates in the Terrace LHA for respiratory disease, injury, and poisoning were more than double the provincial rates (BC Stats 2012e).

Northern Health provides community profiles that further characterize health status in districts, cities and towns including Mackenzie, Prince George, Smithers, and Terrace. The profiles provide a more focused account of health status and characterization of these communities. Table 17.4-7 indicates the proportion of seniors and children/youth compared to the total population, as well as the number of mental health and addictions clients and the number of unscheduled visits to the local hospital's emergency department in each PAC. Of the four PACs, Smithers has the highest proportion of youth and seniors as well as the highest portion of mental health and addictions clients. The high number of emergency department visits likely reflects the catchment area and rural population utilizing hospitals in each of these PAC, as each are hub locations for a variety of smaller communities.

Table 17.4-8 provides a summary of estimated chronic disease in the non-Aboriginal PACs. The data below are estimates provided by Northern Health and represent what "might be expected" at the community level based on community representation within their larger LHA and therefore should be interpreted with caution. Overall, the chronic diseases listed below affect less than 1.5% of the population in all cases. Interestingly, the chronic diseases estimates in Mackenzie mirror that of Prince George, despite the lower proportion of seniors and youth. Hypertension and depression affect more than 1% of the population in each of the PACs, and osteoarthritis affects more than 1% of the Smithers population, perhaps indicative of the higher proportion of seniors.

Table 17.4-7. Northern Health Characteristics in the non-Aboriginal PACs

	Population under 19 Years (%; 2011)	Population Aged 65+ Years (%, 2011)	Mental Health & Addictions Clients (FY 2013-14)	Local Emergency Department Unscheduled Visits (FY 2013-14)
Mackenzie	23%	8%	160	4,887
Prince George	25%	12%	4,798	43,562
Smithers	29%	13%	388	10,622
Terrace	28%	13%	747	19,071

Source: Northern Health (2016)

Table 17.4-8. Chronic Disease Estimates in the non-Aboriginal PACs (2010/11)

	Mackenzie		Prince George		Smithers		Terrace	
	#	% of the 2011 Population	#	% of the 2011 Population	#	% of the 2011 Population	#	% of the 2011 Population
Cardiovascular Disease	17	0.5%	343	0.5%	22	0.4%	57	0.5%
Dementia	7	0.2%	132	0.2%	7	0.1%	21	0.2%
Ischemic Heart Disease	11	0.3%	222	0.3%	15	0.3%	22	0.2%
Osteoarthritis	23	0.6%	464	0.6%	66	1.2%	95	0.8%
Rheumatoid Arthritis	2	0.1%	40	0.1%	2	0.0%	22	0.2%
Asthma	15	0.4%	299	0.4%	24	0.4%	46	0.4%
Congestive Heart Failure	11	0.3%	212	0.3%	16	0.3%	53	0.4%
Chronic Kidney Disease	10	0.3%	203	0.3%	26	0.5%	32	0.3%
COPD	14	0.4%	280	0.4%	11	0.2%	64	0.5%
Stroke	2	0.1%	46	0.1%	6	0.1%	11	0.1%
Depression	40	1.2%	789	1.1%	67	1.2%	157	1.4%
Diabetes	20	0.6%	393	0.5%	23	0.4%	60	0.5%
Hypertension	43	1.2%	858	1.2%	59	1.1%	164	1.4%

Source: Northern Health (2016)
Note:
[1] Community level estimates are based on upon each communities relative share of the total LHA population and reflect what "might be expected" at the community level.

17.4.4.9. Health and Social Services

Regional Study Area

The delivery of health and social services varies across the socio-economic RSA and between regional districts and communities. Many services are provincial responsibilities that are delivered through ministry-specific, agency, or affiliate organization offices depending on the size and location of the community. Federal agencies, especially AANDC, tend to have a larger role, at least in funding if not delivery, of such services in First Nations communities.

Northern Health is the principal health-service provider within the RSA, covering the Northwest, the Northeast, and the Northern Interior health regions (BC MOH 2014). Northern Health reports that health services in the RSA are currently operating "at capacity" and that ongoing challenges include great distances between communities and healthcare facilities.

Hospitals and acute-care services in the RSA include the Mackenzie & District Hospital in Mackenzie, the Prince George Regional Hospital and the University Hospital of Northern BC in Prince George, the Bulkley Valley District Hospital in Smithers, and the Mills Memorial Hospital in Terrace. Assisted living, residential care, and other health facilities are available in Prince George, Smithers and Terrace.

Potentially Affected Communities

The Aboriginal PACs of Kwadacha, Tsay Keh and Takla Landing do not have local hospitals, and have limited on-site medical staff (SNC Lavalin 2013). When needed, residents of these communities are transferred to hospitals and other health care facilities in larger centres, such as Prince George, which is approximately 15 hours travel by road from Kwadacha and Tsay Keh. An ongoing challenge for many other First Nations is the link between present-day social and wellness issues associated with historical actions of colonization, resettlement and residential schools.

The BC First Nations Health Authority (FNHA) provides services, programs, and initiatives to BC First Nations and Aboriginal individuals, families, and communities (FNHA 2015).

Kwadacha

The Kwadacha Nation Health Center is equipped with a physician (one day per month) and two full-time nurses who split their week between Kwadacha and Tsay Keh (E. Ruth, pers. comm. 2015). Additionally, health services are provided by a community health representative (CHR), a mental health counsellor, an addictions and wellness counsellor, a social worker, and youth care worker (Northern Health 2012). Medical specialists visit annually (E. Ruth, pers. comm. 2015) and pre- and post-natal care is available in Prince George or when a doctor is in the community (S. Case, pers. comm., 2014).

Family services in Kwadacha are coordinated through the Ministry of Children and Family Development. The community is also working to establish a safe house for youth and families in the community (S. Case, pers. comm., 2014; E. Ruth, pers. comm. 2015). Health-services providers would like to increase the number of health services staff and availability of health-promotion programs (E. Ruth, pers. comm. 2015). The main challenges in Kwadacha are the limited access to health care professionals and emergency services. In the event of a medical emergency, patients are usually transferred by med-evac (helicopter) to Prince George other regional hospitals.

Recreation facilities in Kwadacha include a new recreation center and the school gym (S. Case, pers. comm., 2014) and a new youth center, which is under construction (March 2015) and will have a gym and a computer lab (E. Ruth, pers. comm. 2015).

Tsay Keh

The health clinic at Tsay Keh is staffed by one physician (one day per month), two nurses who split their week between Tsay Keh and Kwadacha, and a CHR (L. Gleeson, pers. comm., 2014). Other health staff include a social worker, a family support worker, an alcohol and drug/mental health worker, and a youth care worker (Northern Health 2012). Specialists visit the community an annual or semi-annual basis (L. Gleeson, pers. comm., 2014). The TKDN has been advocating for a new health facility and is working to realize this goal (L. Gleeson, pers. comm., 2014; D. Izony, pers. comm. 2015).

The TKDN Health and Wellness Department runs programs for adults, children, infants and families (D. Izony, pers. comm. 2015). The Ministry of Children and Family Development provides child and family services (L. Gleeson, pers. comm., 2014) and emergency housing is available in the community.

Health programs available through TKDN include the Fishing Lakes Healing Camp (2014) which focuses on traditional health and wellness (L. Gleeson, pers. comm., 2014). Other health programs focus on healthy lifestyles, fitness and nutrition (CPHA 2013; D. Izony, pers. comm. 2015). Key community health and wellness challenges in Tsay Keh include the remoteness of the community, the difficulty of finding practitioners, and the lack of capacity available locally (L. Gleeson, pers. comm., 2014; D. Izony, pers. comm., 2015).

The TKDN reports that existing resources are not adequate to address the health and wellness needs of the community; particular needs include full-time nursing and enhanced physician services in the community (L. Gleeson, pers. comm., 2014). Recreation facilities in Tsay Keh include a gym and fitness centre, football field, baseball diamond, and skating rink (L. Gleeson, pers. comm., 2014; D. Izony, pers. comm. 2014).

Takla Landing

Takla Landing's health centre provides face-to-face physician's services for one week each month, supplemented by tele-health videoconference for the rest of the month (RCCBC 2013). The health centre also has a full-time nurse, an alcohol and drug worker, a mental health worker and a youth worker (Northern Health 2012). Nurses lead most of the local health care, and the tele-health capabilities enable consultation with an off-site physician (RCCBC 2013). Takla Landing residents travel to Prince George, Fort St. James, or Vanderhoof for emergency or specialist treatment (S. Teegee, pers. comm., 2014).

Mental health services are available through Carrier Sekani Family Services, and child protection and family services are available in Vanderhoof. Emergency housing is not available in the community. Health and wellness programs have included a Family Camp as part of the Addictions Recovery Program. The existing health and wellness resources in Takla Landing are not sufficient to meet to the needs of the community. Particular gaps include home care, women's health services, and the management of communicable diseases including tuberculosis, Hepatitis (A/B) and HIV/AIDS (S. Teegee. pers. comm., 2014).

The school gym is used for community recreation. The TLFN identified a need for further local recreation facilities and services.

Mackenzie

Health services in Mackenzie are provided through the Mackenzie District Hospital & Health Centre, a five-bed acute care facility that provides medical and emergency services. Health services at the hospital include medical imagining, laboratory services, nursing, home care, public health, mental health and addictions (Northern Health 2014a). The nearest major medical centre is located in Prince George approximately 185 kilometres away (RCCBC 2014c).

Recreation facilities in Mackenzie include an ice area, curling rink, aquatic facility, weight room, and swimming pool. Outdoor recreation opportunities include biking, hiking, camping, boating, and fishing. Sites of interest for recreationists include Morfee Mountain, Williston Lake, and Alexander Mackenzie's Landing (Disctrict of Mackenzie 2011).

Prince George

There a number of facilities providing health services in Prince George. The main hospital is the University Hospital of Northern British Columbia (UHNBC); this 193-bed facility is the largest acute care facility in northern BC, and includes a 19 bed full-service emergency room and cardiac and thoracic surgery services. There are numerous mental health, addictions, family health, reintegration facilities, native healing, youth and family services, social work and outreach services available in Prince George (RCCBC 2014d).

The City of Prince George provides a variety of recreation programs and services to the public and community groups. There are leisure access programs for individuals receiving income assistance that provide, for example, complementary swimming or public skating passes. There are 21 community outdoor skating rinks and 6 recreation centres in Prince George. A number of community programs are available (e.g., arts, aquatics, culture, dance, sports/fitness, music, and others; (City of Prince George 2014b).

Smithers

Smithers and the surrounding area are serviced by the Bulkley Valley District Hospital. The 24-bed hospital provides a full range of services including emergency, medical, surgical, maternity, and palliative services (Smithers Social Planning Council 2011a). Ambulance and air ambulance services are available and major medical care transfer is to Prince George (RCCBC 2014b). Other services available in the community include home care, physiotherapy, occupational therapy, mental health and addiction services, and youth and family support services (RCCBC 2014b). The Aboriginal Health Improvement Committee in Smithers is a forum for Aboriginal people to voice their health concerns and provide information about events or opportunities (Northern Health 2011).

Recreation facilities and infrastructure in the Town of Smithers support a number of activities including golf, skiing, camping and watersports (NDIT 2010). The Bulkley Valley Regional Pool and Recreation Centre provides swimming and fitness facilities, a gym, a climbing wall, skating, and a curling club (Smithers Social Planning Council 2011b).

Terrace

The primary health care facility in northwest BC is the 44-bed Mills Memorial Hospital that serves Terrace and the surrounding areas. The hospital provides surgical and outpatient services as well as

intensive care and mental health services (RCCBC 2014f). Emergency care and ambulance services are also available, including air ambulance (Northern Health 2014b; RCCBC 2014a). Other health services available include extended care, home care, physiotherapy and occupational therapy, addictions counselling, social work, assisted living, and outreach centres (RCCBC 2014f). Terrace has the largest concentration of physicians and services north of Prince George.

Recreational facilities include the Terrace Aquatic Centre, the Shames Mountain ski hill, and the Sportsplex multi-purpose arena (City of Terrace 2010). There are also a number of active community sports, hobby, and service organizations (RCCBC 2014g).

17.4.4.10. Emergency Services

Regional Study Area

The RCMP provides policing services throughout northern BC, including municipal services and rural services. All of the PACs are part of the RCMP North District (BC Ministry of Justice 2012a). Prince George, Smithers and Terrace are serviced by municipal RCMP branches, whereas Kwadacha, Tsay Keh, Takla Landing, and Mackenzie are serviced by corresponding RCMP rural services.

Provincial health services (including Northern Health and the BC Ambulance Service) provide emergency medical support such as transport by ambulance or air ambulance. Fire-fighting services are provided to varying degrees at the community level.

Potentially Affected Communities

Kwadacha, Tsay Keh, and Takla Landing

Medical emergencies are transported by med-evac flights as needed. Patients from Kwadacha and Tsay Keh are transported to the Mackenzie District Hospital, while patients from Takla are transported to Fort St. James. More serious cases may be transported directly to Prince George.

Tsay Keh has an ambulance and two TKND members have completed training to become Emergency Medical Responders. Tsay Keh also has a volunteer fire department with a fire truck (L. Gleeson, pers. comm., 2014). At present, those requiring emergency transport by road from Kwadacha are met by an ambulance from Mackenzie along the Finlay FSR (S. Case, pers. comm., 2014).

Ambulance and fire-fighting services and related equipment (e.g., a fire truck) are not available in Kwadacha (E. Ruth, pers. comm. 2015) or Takla Landing (L. Krebs, pers. comm., 2014).

The local RCMP detachment in Tsay Keh has four officers who provide services to both Tsay Keh and Kwadacha (BC Ministry of Justice 2012a). Law enforcement in Takla Landing is provided by a local RCMP detachment with three officers (L. Krebs, pers. comm., 2014) that serve the on- and off-reserve areas at Takla Landing, as well as Middle River (SNC Lavalin 2013).

Mackenzie, Prince George, Smithers, Terrace

BC Ambulance services are available in each of the municipal PACs (RCCBC 2014f). This hospital in Prince George receives much of the emergency air transport from surrounding areas and is a hub for

many of the surrounding communities, in terms of health care and other services (RCCBC 2014d). The Mackenzie District Hospital & Health Centre has a limited-service emergency room that operates 24 hours a day, and BC ambulance services (RCCBC 2014c) and transports patients to Prince George as needed. Smithers and Terrace also have ambulance and emergency room services, and patients needing additional care are transported to Prince George.

Fire rescue and related services (e.g., highway accident) services are available in Mackenzie, Prince George, Smithers and Terrace (City of Prince George 2014b; CivicInfoBC 2015).

Law enforcement is provided by RCMP detachments in Mackenzie (10 officers in 2013), Prince George (128 officers in 2013), Smithers (9 municipal and 6 rural officers in 2013), and Terrace (25 municipal and 7 rural officers in 2013).

17.4.4.11. Crime

Regional Study Area

According to the BC Ministry of Justice, BC's 2012 crime rate was the lowest rate that has been experienced by the province since 1972 (BC Ministry of Justice 2013). Across the province in 2012, 18% of recorded crime were violent offences and 61% were property offences (BC Ministry of Justice 2013). The total number of criminal offenses within the RSA decreased between 2010 and 2011. Property crimes were most common (ranging from 38% to 50%) while violent crime accounted for approximately 20 to 25% of all crimes (BC Ministry of Justice 2012b).

Potentially Affected Communities

Kwadacha, Tsay Keh, Takla Landing

As the RCMP detachment in Tsay Keh also serves Kwadacha, crime statistics are provided jointly for these communities. Official statistics indicate there was one officer per every 230 community members. The Ministry of Justice reports that crime rates and the number of total offences for this detachment decreased overall between 2006 and 2011, although there was a spike in both indicators in 2008 and 2009. In 2011, violent crime represented approximately one-third of total incidents, and approximately one quarter of crimes were property crimes (BC Ministry of Justice 2012b).

The annual number of criminal code offences in Takla Landing increased between 2006 and 2011, although there is no clear trend over time. In 2011, approximately one fifth of offences in Takla Landing were violent crime (21%) and almost one third (29%) were property crimes (BC Ministry of Justice 2012b). Recent community-based research indicates an increase in crime rates after 2008 was associated with the economic downtown and decline in the local forestry industry (SNC Lavalin 2013).

Mackenzie, Prince George, Smithers, Terrace

The Mackenzie RCMP had approximately one officer per 387 people in 2011. The crime rate was 121 offences per 1,000 people in 2011, which represented an increase from 2010 (BC Ministry of Justice 2012b). Approximately one-third of crimes were violent crimes (31%) and another third were property crimes (24%). The crime rate in Mackenzie has been consistently lower than in Prince George, Smithers, and Terrace (Appendix 17-1, Section 4.14.2).

The police force in Prince George included 128 police officers in 2011; approximately one officer per 592 people. The total number of criminal offences decreased between 2010 and 2011. Of those, the majority were property crimes (BC Ministry of Justice 2012b). The crime rate in 2011 was at 158 offences per 1,000, below the 2010 rate of 169 per 1,000. Crime rates in Prince George have typically been lower than Terrace and Smithers.

Smithers had a police force of six officers or one officer per every 1,279 people in 2010/2011. The majority of criminal offenses were property crimes (53%; BC Ministry of Justice 2012b). Crime rates increased between 2010 and 2011 (from 157 to 169 offences per 1,000 people), but remained low in comparison to previous years. For example, the crime rate in Smithers peaked at 308 offences per 1,000 people in 2005 (BC Ministry of Justice 2012b).

There were 25 RCMP officers in Terrace, for the period of 2010 to 2011; with one officer for every 482 community members in 2011. The total number of crimes was 2,150 with a crime rate of 179 per 1,000 people. Of those, 19% were violent crimes and 38% were property crimes (BC Ministry of Justice 2012b).

17.4.4.12. Community Health and Well-being

Well-being is a term used to characterize social indicators relevant to individuals, families, and communities. Indicators include physical health, access to services, family mobility, crime rates and public safety, economic hardship, and housing. The term "well-being" groups these indicators to facilitate a more holistic discussion and analysis of how these issues relate to and/or perpetuate one another and together enable a better understanding of social circumstances within a particular area or community.

Well-being

The federal government defines specific indicators as relevant to the well-being of Canadians including work, housing, family life, social participation, leisure, health, security, environment, financial security, and learning (Employment and Social Development Canada 2015). For BC, data is available for some of these indicators by Health Service Delivery Areas (HSDAs) via the Canadian Community Health Survey (2011/2012; Statistics Canada 2013c). Most of the PACs (Kwadacha, Tsay Keh, Takla Landing, Mackenzie, and Prince George) are located within the Northern Interior HSDA, while Smithers and Terrace are located within the Northwest HSDA. Although HSDAs represent much larger areas, relative to communities and regional districts, the overall health and well-being trends may provide context as to the health and well-being environments in which the PACs are located.

Physical Health, Stress, and the Well-being Connection

The Canadian Community Health Survey reports on the overall health and well-being trends by HSDA. Common measures of well-being are perceived health, perceived mental health, and perceived life stress. Slightly fewer people in the Northern and Northern Interior HSDAs perceived their health as very good or excellent in comparison to the province. Within the Northern Interior, there was a low reporting of "very good or excellent" health for men, while conversely, more women reported "very good or excellent health" in comparison to provincial averages. Perceived mental health in the HSDAs was similar to provincial averages as was perceived life stress (which

can influence other aspects of physical and mental health), with the exception of females resident in the Northwest HSDA who perceived most days in their lives were quite a bit or extremely stressful (Statistics Canada 2013b, 2013f).

A sense of community belonging also contributes to well-being. Helliwell & Putnam (2004) note that more frequent interaction within a community setting tends to increase or enhance subjective well-being. The sense of community belonging was reported to be higher in Northern Interior and Northwest HSDAs in comparison to provincial and national averages (Statistics Canada 2013b, 2013f). Research indicates higher levels of community belonging equate to more resilient communities that are able to deal with change or adversity (CIHR 2011). Life satisfaction in the Northern Interior and Northwest HSDAs were similar to provincial and national averages (Statistics Canada 2013b, 2013f).

Life expectancy at birth and potential years of life lost (PYLL) from natural and accidental causes, suicides, and homicide are used as indicators of community health. Hospitalization and injury rates as well as rates of smoking in the Northern Interior and Northwest HSDAs were comparably higher in comparison to provincial and national rates.

Within the socio-economic RSA, the average life expectancy at birth is approximately two to three years lower in comparison to the provincial average. On average, the regional districts in the RSA had higher rates of PYLL due to natural or accidental causes, or suicide/homicide (BC Stats 2012b). This indicates that not only the general health of the population in the RSA is at a lower level, but also that residents of the RSA are more likely to be in an accident or to commit a suicide; these factors can point to a number of social problems, often related to low income and isolation (Wilkinson & Marmot 2003; Singh-Manoux A., Marmot M., and Adler N. 2005). Infant mortality rates were higher within the RSA, ranging from a low of 4.1 per 1,000 live births in the RDFFG to a high of 5.3 in the RDKS; the provincial average was 3.7. Rates of hospitalization for respiratory disease and injury and poisoning were also higher within the RSA in comparison to the provincial averages (Appendix 17-1, Section 4.11.4).

Aboriginal Health and Well-being

Definitions and attempts to measure health and well-being are often tied to, or informed by, the values of the specific population to which they are applied. Likewise, the components of health and well-being vary by culture, geography, socio-economic status, community or group, and other variables. Aboriginal or indigenous health and well-being may be influenced by different or additional factors compared to non-Aboriginal populations (Reading J. and Halseth R. 2013; Kenny 2014).

Aboriginal conceptions and definitions of well-being vary but often center around the inclusion of physical, spiritual, emotional, and mental dimensions (NCCAH 2009, 2010). Other similar definitions of health and well-being have included social dimensions in addition to the physical, spiritual, emotional, and mental (NAHO 2007).

The FNHA defines a First Nations perspective on wellness to include "*healthy, self-determining and vibrant BC First Nations children, families, and communities*" (FNHA 2015). A core aspect of Aboriginal wellness is the role of the land—and related traditional activities—as an integral part of individual and community well-being. Other factors contributing to the health and wellness of Aboriginal

communities are reported to include tradition, territories, language, and culture, many of which are also tied to the land.

A recent survey of KwN members indicated that opportunities to improve and maintain community well-being are related to abilities to pursue traditional lifestyles, and to access training, business and employment opportunities (including those within natural resource industries). The survey also identified challenges, which included lack of access to health care, prevalence of addictions, and loss or diminishment of culture (McCook & Case 2012). Although the survey pertained specifically to the membership of the KwN, the outcomes reflect concerns and challenges that have also been raised by members of the TKDN and TLFN.

Community well-being for the Aboriginal PACs has also been influenced by the migration of band members from their home communities to larger centers. Factors that may contribute to these movements include, for example, the quantity and quality of housing and health and social services available, and the pursuit of employment, education and training opportunities. A recent survey of KwN members indicates that 80% of members residing off-reserve would move to Kwadacha if employment opportunities became available. Further, many KwN members who are working or attending school are doing so outside of the community (McCook & Case 2012), and the community has identified a need to prepare young people to enter the workforce, attend post-secondary education, and adjust to urban lifestyles (McCook & Case 2012).

Northern Health and the Social Determinants of Health

The Northern Health Authority oversees health services provision and health and social services programming in the much of the northern region of the province, including provision of services to the non-Aboriginal PACs. Northern Health's approach to the delivery of health and social services is based within "determinants of health" perspective. This approach focuses on prevention and looks beyond the immediate cause of the social and medical condition to understand the potential contributing factors (Northern Health 2009).

17.4.4.13. Summary

The current socio-economic conditions of the socio-economic RSA and PACs described above are a summary of the Socio-economic Baseline Report (Appendix 16-A) which relied largely on secondary data (including statistics from the Census of Canada, the National Household Survey, and First Nations profiles by AANDC). For the Aboriginal PACs, the use of official government statistics is challenged by small populations and low census participation rates, and data for these communities was supplemented, where available, by information provided by the First Nations.

As is typical of rural economies tied to natural resource industries, populations of the study communities have fluctuated over the past two census periods. A relatively high proportion of all PAC populations identified as Aboriginal in comparison to the provincial average, and the regional population was relatively young (Statistics Canada 2013d).

Kwadacha, Tsay Keh, and Takla Landing are accessible by air or, alternatively, via FSRs and have small populations (in the range of 200 to 300 people). Mackenzie is also a relatively small community (3,500 residents in 2011) that has been historically dependent on forestry. There was a 23% decrease

in the Mackenzie population between 2006 and 2011 which showcases the labour mobility associated with resource development industries (Bell 2013). The other PACs—Prince George, Smithers, and Terrace—have larger populations and more diverse economies, although they also maintain strong links to forestry and mining.

Educational attainment levels vary between the PACs. There is a difference in educational attainment between residents of the smaller and remote Aboriginal communities, compared with the larger centres (Statistics Canada 2013d). A high proportion of PAC residents had occupational experience in trades and apprenticeship and trades certificates were also more common (30 to 35%) in comparison to provincial averages (19%). Correspondingly, employment in trades, transport and equipment operations as well as the natural resources and agriculture sectors were higher than average in the PACs. Residents of the larger service centres of Prince George, Smithers, and Terrace had median household incomes above provincial averages. Median incomes were lower than average incomes, pointing to a comparatively larger proportion of lower income earners.

Economic activity in the RSA was based on natural resource industries, including mining and forestry. The "agriculture, forestry, fishing and hunting" sector is particularly important in Aboriginal communities, while mining, quarrying, and oil-and-gas extraction industries are an important source of employment in Smithers and Mackenzie.

Community access to health, social, and emergency services varies by community. The Aboriginal communities rely in part on scheduled visits from health care professionals and transport (as needed) to larger service centres such as Prince George. Local health and social wellness programs have been established within each of the Aboriginal communities. Health, social, and emergency services are more readily accessible and diverse in the larger PACs, although the Northern Health reports that regional services facilities are operating at or beyond maximum capacity. The level of health and social services available often reflects the size of the local population. For example, there are fewer health services in Mackenzie than in larger centers such as Prince George.

Health conditions in the Northern Interior Region, which includes much of the RSA, are below provincial averages for indicators such as life expectancy and self-reported health (BC Stats 2012b). There is also a well-documented discrepancy in health outcomes between Aboriginal and non-Aboriginal populations in BC and across Canada (Mikkonen 2010). Housing conditions also varied between the Aboriginal and municipal PACs. The average number of persons per household and the proportion of homes requiring major repairs were both higher within the Aboriginal PACs for which data were available.

All of the PACs are part of the RCMP North District (BC Ministry of Justice 2012a). Prince George, Smithers and Terrace are serviced by municipal RCMP branches, whereas Kwadacha, Tsay Keh, Takla Landing, and Mackenzie are serviced by corresponding RCMP rural services. Provincial health services are responsible for emergency medical support include transport by ambulance or air ambulance.

While the PACs are described side-by-side within this chapter, the social and economic realities that characterize Aboriginal communities are quite distinct from those of larger, mixed population, more economically diverse, and less remote communities. On average, the remote Aboriginal

communities face greater challenges related to education, employment, and health and social services, although the First Nations are actively working to address these challenges in each community. Health and social wellness are complex and multidimensional, and Aboriginal conceptions of community health and well-being are noted to be particularly holistic and inclusive, incorporating issues related to culture, language, and land use, in addition to practical matters such as work and life skills, education, employment, and family and community support networks.

17.5. POTENTIAL PROJECT EFFECTS AND MITIGATION

As noted in Section 17.3, this assessment focuses on the potential effects of the Project on community well-being. The VCs ("community well-being" and "Aboriginal community well-being") were selected based on an understanding of the logistics of the proposed Project (e.g., employment, income, work shifts, transportation hubs) as well as Project activities and components, input from consultation, the requirements of the AIR (2016), and professional experience. Having separate VCs for Aboriginal and non-Aboriginal PACs acknowledges that there are differences among Aboriginal and non-Aboriginal communities and interpretations of "well-being." Many of the potential influences on community well-being are similar across all PACs. Therefore an initial discussion regarding potential effects on community well-being is provided below for the Aboriginal and non-Aboriginal PACs, with specific reference to items relevant to Aboriginal communities.

17.5.1. Potential Project Effects

Potential effects on community well-being associated with large-scale resource development projects stem from employment and income, population in-migration or influx, and—particularly for Aboriginal communities—changes in the natural environmental and land use practices:

- If poorly managed, **in-migration** (or population influx**)** can have implications for housing, infrastructure, health and education services, and crime, each of which contributes to community well-being. The proposed Project will accommodate employees in an on-site work camp, and utilize a fly-in/fly-out (FIFO) work rotation, thereby avoiding population influx into the PACs and virtually eliminating the potential for social impacts driven by population influx. Past experience with the KS mine indicates Project workers will be sourced from various locations across the province and beyond, as enabled by the use of multiple pick-up locations. An analysis of the past operation suggests that Project workers represented less than 1% of local populations. Based on the same rationale, "community infrastructure, services, and housing" was scoped out as a potential VC for the Project. The expected avoidance of these impacts is supported by the past experiences of the KS Mine. Effects related to population influx are not considered further in this chapter.
- Effects to Aboriginal community well-being may be related to **traditional land use** activities including hunting, fishing, gathering, and other harvesting. These activities are a well-documented component of the Aboriginal perspective of well-being[8]. Changes to the

[8] As noted in Section 17.4.4, a core aspect of Aboriginal wellness is the role of the land—and related traditional activities—as an integral part of individual and community well-being.

environment could affect the ability of Aboriginal peoples to practice traditional land use and harvesting activities. Potential effects on socio-economic conditions (including well-being) and the current use of lands and resources for traditional purposes, stemming from changes to the environment, are assessed in Chapter 20 (Effects of Changes to the Environment on Aboriginal People). Effects related to land and resource use are not considered further in this chapter.

Therefore, this assessment focuses on the potential for social effects stemming from Project employment, including those related to income, work rotation, and other aspects of employment. Employment and other economic effects are also described in Section 1.11 (Project Benefits) and Chapter 16 (Economic Effects Assessment).

Effects will be linked to the number of people from each PAC who are employed with the Project. Specific considerations related to Project employment and community well-being for all PACs, including Aboriginal communities are:

- **High Income**: Incomes in the mining industry are relatively high compared to other industries, and higher incomes may alter lifestyle choices, as increased levels of disposable income may lead to high-risk social behaviours, potentially affecting families and placing pressure on community services. The loss of employment and income (e.g., associated with the eventual closure of the Project) could also affect well-being.
- **Fly-In, Fly-Out (FIFO) Rotation**: Individuals who obtain employment with the Project will work on a FIFO work rotation schedule (i.e., two weeks on, two weeks off, although this may vary for some management positions). Therefore workers will regularly be away from family and home communities for a period of time, which could affect the well-being of both workers and their spouses and families.
- **Work Environment**: Some individuals who obtain employment with the Project may find the work environment to be stressful. Worker well-being may be influenced by the FIFO rotation (described above) camp life (e.g., living with co-workers and intercultural interactions), and expectations for employment behaviours. As working in a camp environment is typical for a number of mines in Canada, people who are new to mining employment or who have limited full-time, paid work experience (e.g., young and/or Aboriginal workers) may be more affected by the work environment.

Employment-related changes could affect community well-being for both Aboriginal and non-Aboriginal PACs. Table 17.5-1 identifies the ways in which these factors could contribute to potential effects on community well-being. They are described in further detail—and with reference to relevant studies and the experiences of other mining projects—in Section 17.5.2.

Based on the above, two potential effects on community well-being are identified.

1. **Changes to worker stress and lifestyle choices**: Stress on workers may be influenced by the nature of the work environment, travel to and from the Project, and time away from families while on FIFO rotation. Higher incomes (as well as increased stress) may also lead some individuals to engage in high-risk behaviours and make poor lifestyle choices. These stresses may be further exacerbated by reduced coping and support resources.

2. **Changes to family dynamics and family/community stress**: Increased stress on workers may affect their families and the quality of time spent at home. Workers' absence from their families while on FIFO rotation may lead to family stress. Higher family incomes may also lead to increased participation in high-risk behaviours and different lifestyle choices. At the community level, the cumulative effects on a number of individuals and families could strain local health and social services.

Table 17.5-1. Factors Contributing to Potential Effects on Community Well-being and Aboriginal Community Well-being

Effect Pathway	Description	Influenced by		
		High Income	FIFO Rotation	Work Enviro.
Absence from home	The FIFO rotation removes workers from their families, and may alter family dynamics and cause stress within the family. The absence of a family member from the home similarly requires adjustment and may result in an increased burden on family members remaining in the home (e.g., housework and parenting).		x	
High-risk behaviours	For some individuals (including workers and their families), high incomes may lead to high-risk social behaviors or lifestyle choices such as drinking, drug use, gambling, violence, reckless activities, etc. Participation in these activities could also be influenced by extended periods (e.g., 2 weeks) of "off-shift" time	x	x	
Job-related stress	Some individuals may find the nature of the work environment to be stressful due to the rotational schedule, intercultural interactions, the camp environment, or the expectations for working in an industrial environment. Job-related stress may also affect families when workers are at home. Job-related stress may be more common among people who are new to mining employment or with limited full-time, paid work experience (e.g., young and/or Aboriginal workers).		x	x
Reduced coping and support resources	An individual's ability to cope with stress is dependent upon their personal coping mechanisms, and the support resources available to them through friends, family, and community. FIFO rotation reduces the ability of workers to access social supports (e.g., friends, family, and community resources) that would typically be used to help cope with stress.		x	x
Community services	Higher stress levels at the level of the worker and the family, as well as high-risk behaviours, may become cumulative at the community level, and could place a strain on community services (e.g., health and social services). Additional consideration is given to Aboriginal communities where most health and well-being services are currently used at or over capacity.	x	x	x
Project closure	For most workers, Project employment will come to an end at the end of the Operations phase or during the Closure phase. Individuals and families will need to transition to new employment. Depending on the economic conditions at the time, finding new employment may be more or less difficult. Regardless this will be a period of transition for Project employees and their families and may result in increased stress and reduced income.	x		

17.5.2. Screening Potential Effects

Table 17.5-2 screens potential interactions between the community well-being VCs and the Project, and identifies the potential effects of these interactions. The Project workforce is the only component considered for the screening of Project effects during the Construction, Operations, Closure and Post-Closure phases. Only effects ranked as possible and/or expected interactions are carried forward to effects assessment.

Table 17.5-2. Screening of Project Effects on Social Valued Components[1]

Project Component/ Activity	Interaction with VCs: Community Well-being	Interaction with VCs: Aboriginal Community Well-being	Potential Effect
Construction			
Workforce (including employment of staff and contractors)	◒	◒	Changes to worker stress and lifestyle choices. • Project employment may increase income due to higher salaries. • FIFO rotation will require time away from family and community. • Some workers (particularly those new to mining employment) may find the work environment to be stressful.
	◒	◒	Changes to family dynamics and family/community stress. • Project employment may increase income due to higher salaries. • FIFO rotation will require time away from family and community.
Procurement	○	○	*Activities related to working at the mine site – including work rotation and the nature of work for different Project components – are addressed in the context of the workforce, above.*
Mine site - aboveground facilities	○	○	
Site roads and linear features	○	○	
Mine site – underground facilities	○	○	
Tailings storage facility (TSF)	○	○	
Management and Monitoring	○	○	
Operations			
Workforce (including employment of staff and contractors)	◒	◒	Changes to worker stress and lifestyle choices. • Project employment may increase income due to higher salaries. • FIFO rotation will require time away from family and community. • Some workers (particularly those new to mining employment) may find the work environment to be stressful.
	◒	◒	Changes to family dynamics and family/community stress. • Project employment may increase income due to higher salaries. • FIFO rotation will require time away from family and community.

(continued)

Table 17.5-2. Screening of Project Effects on Social Valued Components[1] (completed)

Project Component/ Activity	Interaction with VCs: Community Well-being	Interaction with VCs: Aboriginal Community Well-being	Potential Effect
Operations *(cont'd)*			
Procurement	○	○	*Activities related to working at the mine site – including work rotation and the nature of work for different Project components – are addressed in the context of the workforce, above.*
Mine site - aboveground facilities	○	○	
Site roads and linear features	○	○	
Mine site – underground facilities	○	○	
Tailings storage facility (TSF)	○	○	
Management and Monitoring	○	○	
Closure			
Workforce (including employment of staff and contractors)	◒	◒	Changes to worker stress and lifestyle choices. • Some employment will continue during Closure but the number of workers will progressively decrease. • Termination of employment may increase stress for workers and their families.
	◒	◒	Changes to family dynamics and family/community stress. • Termination of employment may increase stress for workers and their families.
Mine site - aboveground facilities	○	○	*Activities related to working at the mine site – including work rotation and the nature of work for different Project components – are addressed in the context of the workforce, above.*
Site roads and linear features	○	○	
Mine site – underground facilities	○	○	
Tailings storage facility (TSF)	○	○	
Management and Monitoring	○	○	
Post-Closure			
Workforce (including employment of staff and contractors)	○	○	No potential effects are identified. • Employment during post-closure will be minimal.
Mine site - aboveground facilities	○	○	*Activities related to working at the mine site – including work rotation and the nature of work for different Project components – are addressed in the context of the workforce, above.*
Site roads and linear features	○	○	
Mine site – underground facilities	○	○	
Tailings storage facility (TSF)	○	○	
Management and Monitoring	○	○	

Notes:

○ = *an interaction is not expected, no adverse effect anticipated and no further assessment is warranted.*

◒ = *an interaction is possible, and may result in an adverse effect requiring active management, mitigation and/or monitoring, warrants further consideration.*

● = *an interaction is expected, and may result in an adverse effect requiring active management, mitigation and/or monitoring; warrants further consideration.*

[1] *This table identifies Project components and activities that may interact with the Social VCs based on the information in Appendix 8-A.*

Project effects on community health and well-being are expected to stem from Project employment, specifically employment with AuRico and/or with the construction contractor as these jobs are likely to involve higher incomes, FIFO work rotation, and stresses associated with the work environment. The Project will also contribute to indirect employment in industries providing goods

and services to the Project, and induced employment driven by workers spending their income in their home communities. However, these jobs are unlikely to contribute to adverse effects on community well-being as they likely involve lower wages, no FIFO work rotation, and lack many of the potential stresses associated with the work environment.

Community well-being may be affected at the individual, family, and community level. As noted above, there are three aspects of Project employment that may affect community health and well-being, including 1) higher incomes, 2) FIFO work rotation shifts, and 3) work environment. The influence of each of these factors is described further below.

17.5.2.1. Community Well-being

The following discussion of the potential effects of the Project by phase is applicable to Aboriginal and non-Aboriginal PACs. An additional discussion of the Aboriginal PACs is provided in Section 17.5.2.2. It considers how and why Aboriginal workers and their families may experience different or additional changes to well-being (e.g., as a result of existing circumstances, limited resources and capacity constraints). It is important to recognize that the Project could provide benefits that support community well-being, as described in Section 17.5.2.3.

While the number of employees required by the Project differs slightly between the Construction and Operations phases, the effect of Project employment on community health and well-being are not expected to differ substantially between these two phases. As such, the potential effects of Project Construction and Operations are considered together below, followed by discussion of potential effects related to the loss of employment during the Closure phase.

Construction & Operations Phases

Potential effects on community well-being during the Construction and Operations phases of the Project include:

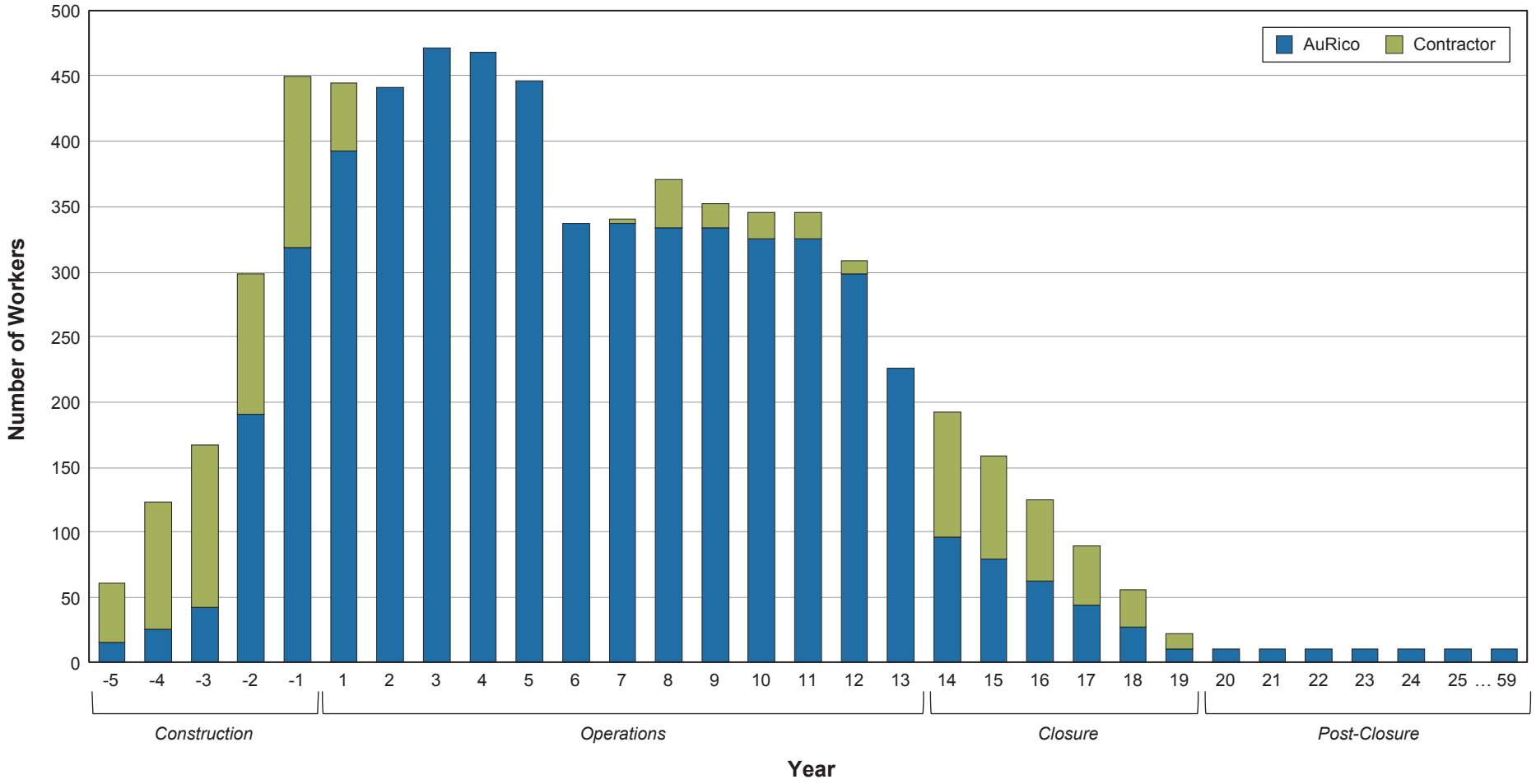
- changes to worker stress and lifestyle choices; and
- changes to family dynamics and family/community stress.

As described in Section 17.5.1, there are a number of factors that may lead to or influence these effects; these factors are discussed below, beginning with a review of employment estimates during these phases, including estimates related to Aboriginal employment and employment from the broader RSA. The potential ways which income, FIFO work schedule, and job-related stress could affect well-being are then described.

Project Employment Estimates

The Project workforce (including direct employees and employees of the construction contractor) will peak at around 440 to 470 people in the last two years of Construction and the first four years of Operations (i.e., Year -1 to Year 5). In later years, the Operations workforce will generally be around 340 to 370 people. Figure 17.5-1 illustrates the Project workforce during the Construction and Operations phases. Additional detail about the number and types of jobs is provided in Chapter 16 (Economic Effects Assessment). Employment by phase is summarized as follows:

Figure 17.5-1
Kemess Underground Project Employment



- The Project workforce during the Construction phase will peak in Year -1 at around 450 people (Figure 17.5-1). In the early years, the workforce will be mostly contractors, shifting to a predominantly AuRico workforce near the end of Construction and start of Operations. Not all workers will be on-site at the same time. During Construction, AuRico plans to undertake preferential hiring and will seek qualified candidates with first priority for the Tsay Keh Nay, second to BC Aboriginal persons, third to other residents of northern BC, residents of other parts of BC, and finally to non-BC residents.
- During the Operations phase, the Project workforce will peak in Years 3 and 4 at around 470 workers. Workers will operate on a rotation and not all workers will be on-site at the same time. Additional contractor jobs will be created in the later years of the Operations phase (Years 8 to 12) to support the construction of the East Dam of the TSF. Similar to the Construction phase, AuRico's hiring preferences will seek qualified candidates from the TKN, followed by other BC Aboriginal persons, other residents of northern BC, residents of other parts of BC, and finally to non-BC residents. The workforce will decrease in the later years, and approximately 225 people will be employed at the end of the Operations phase (Year 13).
- Closure of the Project will result in the end of employment for many Operations phase workers, although some workers may continue (or may be re-hired) to support activities during the Closure phase. Expectations of the Closure workforce will be further refined closer to the time, but for the purposes of the assessment the workforce is expected to comprise both AuRico employees and contractors, and the number of workers is expected to progressively decrease over the six-year Closure phase.
- The forty-year Post-Closure phase is expected to employ approximately 10 people in total, responsible for ongoing care, maintenance and monitoring activities.

Based on the KS Mine experience, approximately 10 to 18% of the workers were Aboriginal. Aboriginal employment for the KS Mine was not influenced by an impact-benefit agreement (IBA) or other form of agreement with the TKN or any other Aboriginal group. However, AuRico plans to establish an agreement with the TKN for the Kemess Underground Project, which will likely include provisions for employment and training. Therefore, AuRico assumes that a minimum of 10% of the Project workforce will be Aboriginal (including members of the TKN and other Aboriginal groups), although it is possible that the actual proportion of Aboriginal employment will exceed this estimate. This would include members of the TKN and other Aboriginal groups. It is possible that the actual proportion of Aboriginal employment will exceed this estimate, at least for some periods of the mine life. Additional provisions and considerations for Aboriginal hiring are described in Section 17.5.3.

Based on the assumption that at least 10% of the Project workforce will be Aboriginal, Aboriginal employment is expected to represent at least 110 jobs (or an average of 22 jobs per year) for the Construction phase and around or greater than 490 jobs (or an average of 38 jobs per year) during the Operations phase. Employment estimates are discussed in more detail in Chapter 16.

Workforce patterns from KS can also be applied to estimate the number of workers hired from the broader RSA. AuRico reports that for the KS Mine, around half (40 to 53%) of the KS workforce were from Northern BC (including Terrace, Smithers, Prince George, and areas further north). For the Project workforce, AuRico assumes that northern BC residents (including the Project PACs) will

make up a minimum of 50% of the workforce. This represents at least 990 jobs for regional residents over the Construction phase (or an average of 198 jobs per year), and at least 2,450 jobs over the 13 years of the Operations phase (or an average of 188 jobs per year). As above, further discussion of employment estimates is provided in Chapter 16.

The Project currently plans to establish workforce flights from Prince George and Smithers and possibly other communities in BC depending on the location of workers.

Increased Income

Socio-economic status is a known social determinant of health, which includes education, employment, and income components. Individuals with higher incomes also typically have better health outcomes (Glymour 2014). BC's Centre of Training in Excellence in Mining (CTEM) indicates that the average income within the mining industry, including office- and site-based jobs, is $115,700 annually (BC CTEM 2015), which is nearly double the average employment income in BC ($58,016 in 2011; (Statistics Canada 2012). However, recent retrospective evaluations of the impacts of mining projects on social conditions found that the higher-than-average incomes associated with mining employment have also resulted in negative health and well-being outcomes for some people (Trepanier 2010).

A number of research initiatives have linked the higher-than-average incomes associated with mining employment to increased substance abuse, domestic violence, and family break-up (Lanari 1999; InterGroup 2005; Buell 2006; NAHO 2008; Brubacher Development Strategies Inc. 2009; Krekshi 2009; Shandro J, Ostry A, and Scoble M 2012; Shandro J et al. 2014). Disposable income and long periods of down time can lead workers to increased use of drugs and alcohol which has been linked to domestic violence and family break-up. Further, higher disposable incomes without financial management skills can lead to poor spending choices (Shandro J et al. 2014). The portion of the workforce affected in these ways is not known, but there are consistent findings linking these issues to high incomes in the mining industry (Lanari 1999; InterGroup 2005; Buell 2006; NAHO 2008; Brubacher Development Strategies Inc. 2009; Krekshi 2009; Shandro J et al. 2014). At the community level, increased incidence of substance abuse and domestic violence can negatively affect well-being and may strain health and social services (e.g., social workers, and mental health councillors); this may be an issue in the Aboriginal PACs (Takla Landing, Kwadacha, and Tsay Keh) where health and social services are already limited and reported to be operating at or above their capacity.

Recent research indicates that income equality within a community is strongly correlated with community health and well-being outcomes, with links to intra-community trust, social support, and happiness (Sachs 2015). Other research supports these findings, reporting that real or perceived income inequalities are better predictors of health outcomes than actual income (Singh-Manoux A., Marmot M., and Adler N. 2005). In other words, communities with the greatest differences between the lowest and highest incomes, and hence largest disparity in incomes, statistically have poorer ratings for community well-being in comparison to communities with small disparities in income. In all PACs and throughout the socio-economic RSA in 2010, median incomes were lower than average incomes, pointing to a comparatively larger proportion of low income earners (Statistics Canada 2013d).

As such, relatively high incomes in the mining industry could have a greater effect in communities with below-average incomes, as well as those with an existing income disparity. More affluent and larger communities in which average and median incomes are higher, and income disparity is less notable, are expected to be less susceptible to the introduction of higher than average mining incomes. Smaller communities also have comparatively limited access to the health and social services and report that existing services are operating at or above their capacity.

Considering the above, it is also important to recognize that increased incomes can also bring benefits in terms of community well-being, in terms of improved access to goods and services, education, housing, and other resources for workers and their families. These and other potential benefits to well-being are discussed below in Section 17.5.2.3.

FIFO Work Schedule

Another aspect of Project employment that could affect worker and family well-being is the FIFO work rotation schedule. FIFO employment inherently requires regular travel and time away from family, which can be stressful for workers and their families. The FIFO operation of the Project will likely be based on a 2-week-on, 2-week-off rotation. Therefore, workers will travel every two weeks, and will work ten- to twelve-hour shifts while on site. On the other side of the rotation, they will return home and will have two weeks off to recuperate.

Frequent travel and long work days are considered stressful working conditions (Chuang 2010). Work rotation shifts based on a FIFO schedule also remove the worker from the home environment in which their social support resources and coping tools are present; these are the same resources that would typically be used to buffer the effects of stress (Pearlin 1981; House 1988; Kawachi 2010; Thoits 2011). Higher stress levels, coupled with decreased access to social support resources while at site, may result in adversely affect worker health and well-being.

Effects of FIFO rotation on workers' families are well documented. Recent studies have identified a number of challenges for families related to financial management, substance abuse, the division of household labour, and health. Families reported feeling disconnected due to the lengthy shift rotations and workers reported feeling too exhausted to participate in family life or other activities outside of work (Shandro J et al. 2011; Shandro J, Ostry A, and Scoble M 2012). Other outcomes reported by families with one member participating in FIFO mining employment include increased stress, changing family roles and dynamics, challenges to martial and parental relationships, the feeling of being a single parent, increased propensity for substance abuse, domestic violence, and others (Brubacher Development Strategies Inc. 2009).

The FIFO rotation can also affect workers' spouses and families who remain in the home. Research indicates there is a notable burden on the spouse and children of employees engaged in FIFO work rotation (InterGroup 2005). The spouses of mining employees describe taking on extra household responsibilities and essentially living like a single parent while their partner is on site. The partners who were engaged in mining employment who expressed feelings of guilt about the increased responsibilities and demands placed on their partners (InterGroup 2005). Each of these factors can detract from individual and family well-being.

There are other studies and reports examining the connection between FIFO mining employment and increased stress within family and spousal relationships. A recent study (Ryser et al. 2012) conducted with residents of Mackenzie, BC who were engaged in long-distance commuting for work found a wide range of reported benefits (e.g., financial, education and training, work experience) and concerns (e.g., costs, impacts on family, and safety). The lack of concentration of benefits and concerns of long distance commuting suggests the experience may be highly individual and dependant on individual factors. Some studies have highlighted that effects of FIFO rotation are not universal and many individuals and families do not experience the challenges described above, and that a minority (3 to 21%) of workers are particularly vulnerable in this respect (Clifford 2009). Personal factors contributing to higher stress levels were noted to included poor quality relationships with others, and low levels of support. The study recommended tailoring assistance to those identified as being most vulnerable and ensuring that employees (and their families) are informed about potential FIFO-related stress before beginning employment.

Work Environment

The Project will operate in a similar manner to other remote Canadian mining projects, and therefore veteran employees of the mining industry are expected to be well adjusted to the challenges and opportunities presented by mining employment. However, some workers may find aspects of the work environment to be stressful for various reasons. This is expected to be most relevant for individuals who have not previously worked in the mining industry, as well as people with limited experience working full-year, full-time (or with less experience in the wage economy in general).

Expectations for workplace performance may be challenging for some new workers, including requirements for compliance with site policies, work schedules, and basic employment behaviours (e.g., communication, accountability, teamwork). As described above, Project employment will involve FIFO travel and—for many workers—relatively long work days, and physical activities requiring a high level of alertness and adherence to site protocols; these factors have been associated with strenuous or stressful working conditions (Chuang 2010; AccessEAP 2015). Although health and safety risks are well managed in the Canadian mining industry, the nature of the work could be fatiguing to some individuals, particularly if they are new to the industry. These factors, coupled with the remoteness of the mine site, time away from family and community, and reduced access to coping mechanisms could affect worker stress and well-being.

A 2015 report by a corporate psychology organization working with a number of Australian mines identified triggers of job-related stress in the mining industry (AccessEAP 2015). Job insecurity was a leading cause of stress, associated with volatility in the mining industry and uncertainty about job continuation in an economic downturn. High expectations for production and performance were also identified as sources of potential stress (AccessEAP 2015). A BC-based mining study showed a similar link between job uncertainty, stress in the workplace, working hours and shift schedules (Shandro J. et al. 2014), and related effects on individual and family stress and well-being. These challenges were experienced by both Aboriginal and non-Aboriginal workers (Shandro J., Ostry A., and Scoble M. 2012).

Studies of the mining industry (Garrido 2013; AccessEAP 2015) have also found that stress in the mining workplace can be driven or exacerbated by conflict between different groups of workers,

which can lead to bullying, harassment, anxiety, and depression. Conflict between workers could affect the ability of workers to appreciate their non-working hours at camp. On the other hand, respectful and friendly relationships among workers were the most important factor in mitigating these effects within the mining workforce (Garrido 2013). The isolation of remote mine sites, and life at the on-site camp, can compound these influences. One study of workers engaged in long distance commuting from Mackenzie, BC revealed that social isolation was the leading factor in the decision to stop long-distance commuting and return to employment in their home community (Ryser et al. 2012).

Overall, many of the Project's workforce are expected to have had previous experience in the mining industry and are therefore less likely to be affected by the work environment and work expectations. Efforts will be made to identify and assist workers who may be vulnerable to these stressors, including Aboriginal workers (discussed further in Section 17.5.2.2, Aboriginal Community Well-being) and people new to the mining industry.

Closure Phase

For most workers, Project employment will come to an end at the end of the Operations phase or during the Closure phase. Individuals and families who have relied on employment will need to transition to new employment. Depending on the economic conditions at the time, finding new employment may be more or less difficult. Regardless, this will be a period of transition for Project employees and their families and may result in increased stress and reduced income.

The loss of employment as jobs come to an end could have an adverse effect on community well-being. Potential effects related to the Closure phase of the Project, including termination of employment and income, include:

- changes to worker stress and lifestyle choices; and
- changes to family dynamics and family/community stress.

Although regular reductions to the workforce are planned over the course of the Operations phase, approximately 225 people will be employed in the last year of mine operations. Some of these workers may continue to be employed to support mine decommissioning and closure activities, but over the course of the Closure phase most employment will be terminated. The loss of employment, particularly if a number of workers (and families) from the same community are affected at the same time, could have an adverse effect on individual, family, and community well-being (Shandro J et al. 2011). However, it is important to also recognize that the end of employment is a standard part of the mining lifecycle, and does not negate the employment benefits that were realized over the preceding years.

During the Post-Closure phase, employment will be minimal (i.e., an estimated ten workers for care and maintenance activities over 40 years); no potential effects related to job losses are identified during this phase.

Loss of Employment

As employment ends during the Closure phase, worker and family well-being could be affected by the transition to new employment; prolonged unemployment and potential challenges finding a

new job; decreased income; and new changes in household responsibilities (e.g., if the worker is now spending more time at home). While the drivers of change are slightly different than those discussed previously for the Construction and Operations phases, the outcomes could be similar; for example, each of these stressors may potentially contribute to high-risk behaviours such as alcohol and drug use, changes in family dynamics caused by changing roles and income, and pressures on family and community support services:

- As noted earlier, substance abuse has been linked to domestic violence and family break-up in the context of mining employment (Lanari 1999; InterGroup 2005; Buell 2006; NAHO 2008; Brubacher Development Strategies Inc. 2009; Krekshi 2009; Shandro J. et al. 2014) and particularly in the context of economic downturn associated with project closures (Shandro J. et al. 2011). While the portion of the workforce that may be affected in this way is unknown, changes to family dynamics and lifestyles choices (e.g., substance abuse, domestic violence, and family break-up) are considered to detract from community health and well-being.
- Unemployment within the family (and potentially at the community level) can be a notable source of stress. As related to community well-being, recent research indicates that unemployment associated with economic downturn occurring at the closure of a mine project can results in increased poor physical and mental health outcomes at the community level (Shandro J. et al. 2011).
- The effects of closure are not limited to the direct loss of mining employment but can also extend to the economies supported by indirect and induced employment and expenditures. For example, research indicates that for every job created by the construction phase of the Mount Milligan project (a recent mining project in northern BC), two indirect or induced (i.e., spin-off) jobs were created within communities near the Project (Shandro J. et al. 2014). As described in Chapter 16, the Project is expected to create an average of 192 indirect and induced jobs per year in the RSA during the Operations phase. The resultant effect of the loss of mining employment as well as the indirect and induced employment could negatively affect community health and well-being, particularly if alternative projects are not available to engage the workforce.
- The effects of job losses on workers and their families could also affect support resources within families or communities. Those who experience increased stress related to unemployment are expected to draw on social support resources to buffer these effects. However, social support resources are expected to be lowest where levels of unemployment are highest.

A recent study of a northern BC mine noted that job insecurity around the end of employment is a key factor in the connection between the working environment and health outcomes. Low job security has been linked to adverse physical and mental health outcomes. However, although the study reported that a number of locally hired mine construction workers worried about their impending unemployment following the end of construction, the majority of local residents regarded project employment as having a positive impact on local workers, their families, and surrounding community (Shandro J. et al. 2014).

It is important to note that potential effects related to job losses at Closure are dependent on two factors, both of which beyond the scope of what can reasonably be controlled or predicted. First, the

nature of effects will vary with the individual, based on their personal preferences and coping abilities. Second, the effect of job losses at closure will be strongly influenced by the economic conditions at that time (i.e., nearly 20 years in the future), including the activities of other mines, as well as other industries. If the resource economy is strong and alternative projects are underway, it is likely that Project workers will be able to gain alternative employment; their options will also be enhanced by the skills and experience that they have gained through employment with the Kemess Project. Conversely, if the mining economy is in a downturn and few employment opportunities are available, the effect of Project job losses on individual, family, or community well-being will likely be more pronounced.

The end of employment is an inevitable part of the mining lifecycle, and does not negate the employment benefits that were realized over the preceding years. Benefits are further discussed in Section 17.5.2.3.

17.5.2.2. Aboriginal Community Well-being

Overview

The general factors influencing worker, family, and community well-being in relation to mining projects are similar to those described in Section 17.5.2.1: the above-average incomes associated with mining employment have been linked to increased substance abuse, domestic violence, and family break-up; FIFO rotation can be a hardship for both workers and their families; various aspects of the working environment could lead to job-related stress; and the loss of employment at closure could affect worker and family well-being. The drivers of effects to community well-being (e.g., high income, FIFO, the work environment) are the same for both Aboriginal and municipal (non-Aboriginal) PACs; however, the outcome or effect on individuals and families may be influenced by factors including the social and community support available. This section describes some of the considerations specific to Aboriginal community well-being.

Numerous international organizations (including the International Finance Corporation, United Nations, and International Council on Mining & Metals) recognize that Aboriginal and other indigenous populations have different interests and impacts in the context of mining and other industrial development, and may be particularly vulnerable to change. This may limit the ability of Aboriginal people and groups to benefit from resource development opportunities (e.g., project employment and contract work). As a result, Aboriginal groups may be more vulnerable to the adverse impacts associated with project development in comparison to non-Aboriginal populations, and also less able to access benefits.

The Aboriginal PACs included in the assessment—namely the communities of Tsay Keh, Takla Landing, and Kwadacha—exhibit markedly different socio-economic characteristics compared to the non-Aboriginal PACs. The Aboriginal PACs are small and remote, and there are limited opportunities for employment, business, or education in the communities. These factors have led to high levels of unemployment, and many people leave the communities to take jobs in larger centres. Social and health services are typically operating at or above their capacity and constrained by limited staff, infrastructure, training and financing; the First Nations are all working to improve the services and programs offered in these communities, including programs aligned with cultural

values and traditions. For some Aboriginal individuals, participation in Project employment may represent a notable shift in lifestyle, particularly for people who are currently unemployed (or under-employed), with limited work experience in mining or other industries, and/or a lack of experience with FIFO work rotations.

Access to services, transportation, employment, education, and other opportunities are more readily accessible in the non-Aboriginal PACs (Mackenzie, Prince George, Smithers and Terrace), resulting in socio-economic characteristics more aligned with the regional and provincial averages.

The following factors could affect the Aboriginal PACs differently or additionally to the effects described above.

Income Disparity

Communities with the greatest differences between the lowest and highest incomes, and hence the largest disparity in incomes, are statistically expected to have poorer ratings for community well-being in comparison to communities with small disparities in income. In the small Aboriginal communities, where existing incomes are below provincial and regional averages, high-paying mining salaries may benefit some households but could also have negative implications for income equality and community well-being. Statistics show that at least one of the Aboriginal PACs (Kwadacha; no income data was available for Tsay Keh or Takla Landing) already exhibits some notable income inequality.

Strain on Community Support Resources

Community resources are not limited to formal service providers, but may also include relationships with family and friends. These relationships may be particularly important in the Aboriginal PACs where there are strong familial and cultural relationships that form an important support network within these communities and First Nations, including support for elders, children, families, and others at times of need. As described above, certain aspects of mining employment may result in increased family and community stress, and could affect the availability or capacity of these community resources. This is dependent on the number of individuals that become employed with the Project and the ability of individuals within a community network to rely on each other, and to give and receive social support. The effect can be exacerbated if there are a number of families having similar experiences and challenges. If there are a number of affected families within one community or network, the capabilities and effectiveness of social support networks could decline.

Participation in Cultural Activities

Project employment could also affect a worker's participation in important community and cultural events or exchanges (e.g., attending funerals and other ceremonies; ensuring elders are supplied with food and firewood), many of which provide support for friends and family. These activities can also be important for building and maintaining relationships in the community. However, the FIFO work rotation may limit an individual's participation in community and/or cultural affairs, thereby decreasing support available to others, or enhancing the burden on other community members.

Challenges Engaging Aboriginal Workers

Across Canada (and throughout the RSA and PACs), the Aboriginal population shows lower levels of participation in the labour force, and higher levels of unemployment, and a relatively young population with limited work experience. The shift from unemployment (or under-employment/ seasonal employment) to full-time, the FIFO rotation may be challenging for prospective workers with less exposure to full-time/full-year work or participation in the waged economy.

Mining and other industries in Canada experience some challenges in recruiting and retaining Aboriginal workers (Howard, Edge, and Watt 2012). The most significant issues for recruitment include a lack of work experience, skills, and education, which makes it difficult to find qualified employees. Even basic requirements (e.g., high school completion, driver's licence) can limit Aboriginal access to a position. Aboriginal workers may also be reluctant to leave their home communities for work. In terms of retaining workers, job expectations and performance can also be challenging[9], particularly if workplace attitudes and behaviours are not aligned. Conflicts within the workforce (e.g., cultural misunderstandings, racism)—as well as frustration about career and skills development—can also make it difficult to retain Aboriginal workers (Howard, Edge, and Watt 2012).

Absenteeism of Aboriginal workers has also been linked to participation in cultural or traditional activities, particularly seasonal activities. A series of interviews (Howard, Edge, and Watt 2012) found that it is not uncommon for Aboriginal workers to leave paid employment, or increase absenteeism, in order to participate in seasonal hunting and fishing activities. Absenteeism may also be attributed to cultural needs such as funerals and grieving periods for community members. A lack of experience in the wage economy, and a lack of exposure to this experience among family members, can also be a factor (Howard, Edge, and Watt 2012).

The need to address these factors is largely recognized within the mining industry in Canada, and has been addressed through a variety of creative and culturally sensitive measures. For example, the Meadowbank Mine in Nunavut has implemented workforce programs to improve retention of Aboriginal workers, including cross-cultural training, hiring local human resource liaison officers, and including family members in workers' orientation programs (Howard, Edge, and Watt 2012). A hydropower project in Ontario also includes cultural training for employees, policies on seasonal activities and bereavement, and Aboriginal counsellors available on-site (Howard, Edge, and Watt 2012). Stress management is also a common element within agreements between mining proponents and Aboriginal groups (e.g., Musselwhite Mine, Ontario (NRCAN 2007)).

Loss of Employment at Closure

As described above, the Closure phase will involve the loss of employment previously supported by the Project. The extent to which Aboriginal community well-being is affected by Project closure is dependent on the degree to which individuals and the community economy come to rely on the

[9] The top Aboriginal work performance challenges (as identified by a survey of Canadian businesses in a variety of sectors) include absenteeism, skill levels, on-the-job productivity and quality of work, and substance abuse (Howard, A., J. Edge, and D. Watt. 2012. *Understanding the Value, Challenges, and Opportunities of Engaging Metis, Inuit, and First Nations Workers*. The Conference Board of Canada).

Project as well as the economic conditions at the time of closure. As described in Section 17.5.2.1, the Closure phase may be a period of instability as Project workers transition to new employment, and/or return to the home.

In general, communities with more diverse economies are expected to be less affected by Project closure in comparison to smaller communities with less diverse economies. Within the smaller TKN communities, lost income and business contracts may be more difficult to replace compared with the larger and more economically diverse communities in the region. Therefore, these communities may be less able to address the challenges presented by closure of the Project. However, if other mining projects (or activities requiring comparable skills) are in development during the Closure phase, workers ending their employment at the Project will likely be able to transfer their skills and experience to new employment in the region.

17.5.2.3. Potential Benefits for Community Well-being

The preceding sections describe the potential adverse effects of the Project on community well-being, as related to various aspects of employment. However, it is also important to recognize that the Project also presents numerous opportunities for improved well-being, and there are potential benefits associated with many of the same factors described above. While the focus of this report is the identification of potential adverse impacts—so that these effects can be appropriately avoided or mitigated—recognition of the corresponding benefits is included to show a balanced view of the potential effects.

It is also important to recognize that the effects of the Project on worker, family and community well-being will be experienced differently by different people. The balance of benefits and challenges is not "one or the other", and each individual will experience slightly different effects depending on their capabilities, personality, and opportunity, as well as their personal choices and priorities:

- **Income**: High-paying mining salaries could contribute to substance abuse, violence, and other high-risk behaviours, as has been well-documented in recent research of the mining industry. However, increased incomes can also provide better access to goods and services for workers and their families. People may choose to use increased incomes to invest in housing, education, and other services that support their families and communities.
- **FIFO:** Workers and families familiar with FIFO work schedules are expected to adjust to Project employment more readily and may then benefit from extended time off to spend with family and contribute to household chores and responsibilities. For Aboriginal workers, off-work periods may also be spent on the land pursuing traditional land use activities.
- **Other**: Additional benefits of Project employment include, but are not limited to, work experience, training, skills development, formal and informal training, improved confidence and life skills, as well as a sense of achievement. Many people and communities in the RSA have experienced job losses due to the depressed economy in north-central BC (e.g., due to mill closures), and will likely look favourably on the opportunity to regain meaningful employment. Prospective workers will also be able to advance their training and experience, resulting in an overall bolstering effect on the local labour force, and can also act as role models in their communities. Similarly, local businesses engaged in providing goods and

services to the Project also enhance the ability of the local economy to provide employment and to participate in large scale resource development projects.

The potential benefits of the Project may also offset or balance other pressures on community well-being. For example, families that have struggled with unemployment, low income, substance abuse, or other challenges in the past may have access to additional resources and opportunities. The pursuit of traditional land use activities including hunting, trapping, and fishing may be supported not only through increased available time (i.e., during off-rotation periods) but also through increased financial resources for vehicles, equipment and fuel.

Overall, the potential beneficial effects of the Project as a result of employment and economic development are numerous. The manner in which local people and businesses experience the effects of the Project—and the balance of benefits and challenges—will ultimately depend on individual choices and the degree to which community and family supports are available to support those who obtain Project employment. Ultimately, there are likely to be a greater proportion of Project employees that have had previous work experience with FIFO and work rotation as compared to individuals without this type of experience. Well-being challenges are expected to be most pronounced for those just beginning work in a FIFO environment, including those with limited prior work experience.

To support the benefits of the Project for local communities, and ensure that potential adverse effects are managed, AuRico established an IMA with the TKN in 2012. The agreement includes several commitments regarding employment and training related to recent years of exploration activities. Under the agreement, TKN members are hired on a priority basis, if qualified, and on-the-job training opportunities are provided. The company's commitment to reducing barriers to employment and helping TKN members become qualified for employment opportunities over all phases of the Project is also stated in the existing agreement. In addition, AuRico is pursuing an Impact-Benefit Agreement (IBA) with TKN. Further discussion of mitigation efforts supporting positive community well-being outcomes for all PACs is provided in the following section.

17.5.3. Management Plans, Mitigation Measures and Monitoring Programs

17.5.3.1. Mitigation Measures

Although the nature and extent of effects will be dependent on individual traits and choices, the general factors influencing worker, family, and community well-being in relation to mining projects are well documented, as described in Section 17.5.2. These effects can be effectively mitigated and managed through a series of good management practices and support for employees and communities. Mitigation measures are presented below for effects for the Construction and Operations phases, followed by mitigation measures for the Closure phase.

Mitigation measures pertaining to the TKN will be included in IBA negotiations with TKN. The IBA may include provisions related to employment and training, well-being, and other topics; however, specific measures are uncertain at the time of writing and are not included in the discussion of mitigation measures provided below.

Construction and Operations Phases

Potential adverse effects on worker, family, and community well-being are primarily related to higher than average incomes, the FIFO rotation, and work environment. To minimize the potential for these effects to occur AuRico will ensure support for worker health and well-being through corporate policies, supportive programs for the workforce, and an Employee and Family Assistance Program (EFAP). These mitigation measures have been developed with consideration of Northern Health's Best Management Guide for Industrial Camps (Northern Health 2015a), workplace guidance from the Mental Health Commission of Canada, and documented best practices for the mining industry.

Health and Wellness Management Plan (HWMP)

AuRico will develop a Health and Wellness Management Plan (HWMP) as part of the Project's occupational health and safety program, in accordance with the Best Management Guide For Industrial Camps (Northern Health 2015a), National Standard of Canada Psychological Health and Safety in the Workplace (CSA Group & BNQ 2013) and Psychological Health & Safety: Action Guide for Employers (Gilbert M. and Bilsker D. 2012). The HWMP will include a corporate policy statement expressing the company's commitment to the well-being of all workers including physical and mental health, safety, and wellness.

As part of the HWMP, AuRico will:

- incorporate aspects health promotion messaging within health and safety orientation (including healthy communities, physical activity, healthy eating, tobacco reduction, injury prevention, stress management, sexual health, and substance abuse);
- identify indicators to support monitoring of worker well-being contributing to early identification (and proactive management) of issues;
- conduct an annual evaluation of actions taken and programs implemented for worker health and wellness, and identify new or adaptive management measures if needed;
- provide access to counselling and other resources on-site, either in person or via private video conference (as part of the Employee and Family Assistance (EFAP), below);
- clearly identify "fit for work" policies and procedures, including drug and alcohol testing and expectations;
- identify policies and procedures regarding the pursuit of treatment for substance abuse or other issues, including leave time and re-hiring considerations; and
- provide on-site access to books and other resources regarding physical and mental health and well-being, and self-care.

Employee and Family Assistance Program

The EFAP will be part of the employee benefits program. Through the EFAP, employees will have direct access to financial management resources, personal counselling, and other forms of personal assistance such as access to resources addressing substance abuse, mental health, stress and other

issues. Social services providers from the Northern Health Region have identified these issues as potential barriers to successful training and employment (Shandro 2014), and AuRico will look to support and retain employees (and their families) through the EFAP. The EFAP will be developed and delivered by qualified practitioners. These services will support employee retention and a positive work experience for all employees.

The EFAP will include components that have been recommended as part of industry good practice for FIFO work environments and the mining industry (e.g., counselling for workers and families, financial management programming, etc.) (Shandro J et al. 2011)[10]. The EFAP will also identify social and family support services in the socio-economic RSA, including all PACs, and will identify the services that can be accessed through workers' extended health plans or other benefits. Additional support may also be provided for Aboriginal workers (described below).

Worker Orientation and Training

The standard orientation for all on-site workers will include:

- communication of AuRico's commitment to employee health and wellness (including mental well-being);
- cultural awareness training, with an aim to manage misunderstandings and intercultural conflict in the workplace;
- resources and techniques for stress management, conflict resolution, relaxation, and time management;
- an overview of the on-site and off-site resources and benefits; and
- information about how and when to access programs and services on site as well as who can provide assistance if needed and who to speak to in the event of workplace conflict or harassment.

Access to Communications

To enable continued communication with family and others (i.e., workers' coping and support resources), AuRico will provide access to internet and telephone. This communication will support both workers and their families.

Aboriginal Employment and Training Resources

As described in Chapter 16, the priority for Project employment will be for qualified members of TKN and other Aboriginal groups. AuRico will also employ an Aboriginal Liaison Officer who will

[10] Social service providers from the Northern Health region have identified wellness and skills planning as critical to success of education, training, and employment. Essential plan components were identified as including financial management, coping, problem-solving, and stress management. Social service providers also noted that wellness strategies are helpful to some families that struggle with the transitions associated with shift work and site rotations (Shandro, J. 2014. *Summary Report for the Regional Health Forum on Community Health and Extractive Industry Development*. March 2014. The University of Victoria & The UBC Norma B. Keevil Institute of Mining Engineering: Victoria, BC). The HWMP and the EFAP proposed above respond to these needs.

engage with prospective applicants and provide information about employment opportunities, qualifications, and the nature of working at the mine site. The Liaison Officer will also engage with workers and their families to ensure that potential well-being issues (e.g., financial management, job-related stress, workplace conflict) are identified and appropriately managed.

For TKN, additional support for workers, families and communities may be developed though an IBA (currently under negotiation at the time of writing this chapter).

Engagement with Aboriginal PACs

For the Aboriginal PACs, the proponent will communicate regularly with Aboriginal leadership and the councillors/agencies responsible for health and social services to stay informed about changes within communities (including changes related to alcohol, drugs, family stress) and potential connections to the Project. At least one staff member will be designated for liaison and engagement with Aboriginal PACs. If issues are identified, AuRico will work collaboratively with Aboriginal leadership to identify and implement additional mitigation and management measures.

Pre-Recruitment Information Sessions

Before recruitment for the Construction or Operations workforce begins, AuRico will arrange information sessions in each of the Aboriginal PACs (Kwadacha, Tsay Keh, and Takla Landing) to provide information about the challenges and opportunities associated with FIFO mine employment. These sessions will be targeted at both prospective workers and their families and will aim to give all parties a realistic understanding of the FIFO schedule, employment expectations, and the commitments required of all parties. Information about upcoming hiring processes, job applications, and Project contacts will also be provided.

Engagement with Local Health and Social Services Providers

Primary health and medical services will be provided on-site by qualified practitioners. AuRico will also maintain communication and information sharing with health and social service providers in Aboriginal and non-Aboriginal PACs, and the RSA (via Northern Health and other relevant agencies), in order to proactively identify and address issues and concerns related to community well-being and service provision. Social services providers from the Northern Health Region have suggested that community-wide or regional approaches to program delivery may be more attractive to funding agencies (Shandro 2014).

Closure Phase

The closure of the Project will result in a progressive decline in the size of the workforce at the end of Operations and over the Closure phase. Job losses may increase individual, family, and community stress and affecting community well-being. The degree to which well-being is affected will be somewhat dependent upon the choices and circumstances of each individual, as well as the broader economic conditions at the time of Closure and the availability of alternative projects and employment opportunities.

In order to minimize the effects of job losses on well-being, AuRico will develop and implement a Workforce Transition Plan to assist employees in their preparation to identify and secure new

employment. The transition plan will be developed in the later years of the Operations phase and is expected to resemble the successful transition program implemented in 2009 for the closure of the KS Mine. Transition support at the KS Mine involved the establishment of a transition strategy and joint committee. The committee provided assistance and support to all mine employees in preparation for mine closure, and was composed of representatives from management, union, and various work crews. The committee's mandate was to provide all workers with information about upcoming mine closure and the opportunities and/or assistance available to help workers plan for the future. Various communication methods were used (e.g., bulletin boards, monthly newsletters, mail-outs) as well as regular town_hall-style meetings to update employees on the plan for the closure of the mine. Highlights of the KS Mine transition activities included:

- a needs assessment survey to determine the services of most interest to workers;
- a central action centre established in the camp and manned by committee members, to provide information and resources to interested workers;
- hosting various potential employers at site to give presentations and interview interested employees for vacant positions;
- additional resources including financial advice, information about government programs, and job placement resources;
- training sessions to prepare Kemess employees for future employment, including equipment operation certification programs and other mining-related training; and
- providing on-site services of an organizational performance company experienced in EFAP planning and delivery, including resources and counselling related to job losses.

The forthcoming strategy for the Project will be based on updated workforce projections, information about economic conditions, and available community resources at the time of closure (i.e., more than 15 years in the future). The Workforce Transition Plan will describe the actions and resources that will assist Project employees at the end of their employment. At a minimum, the strategy will include the following:

- Upon request, AuRico will provide documentation of employment with the Project, including dates, roles, the skills or proficiencies for each position, and training received.
- Upon request, AuRico will provide references for future employers.
- AuRico will provide support to interested workers regarding job search skills and resources.
- The Aboriginal Liaison will work with the TKN and other Aboriginal groups to identify needs or concerns with respect to Aboriginal workers and their families and communities.

17.5.3.2. Effectiveness of Mitigation Measures

In the mining industry in Canada and internationally, the potential effects on community well-being, including Aboriginal community well-being, and the effective mitigation of these effects, are relatively well understood. Many of the mitigation and management measures described above are practised at other remote mining operations, particularly with respect to Aboriginal employment

and training resources. Additional measures to address Aboriginal well-being and Project-related benefits may be defined in the ongoing IBA negotiations between AuRico and the TKN.

Considering the mitigation and management measures described above—as well as monitoring activities included in the HWMP, and ongoing engagement with relevant service providers and Aboriginal groups—the potential effects of the Project on community well-being and Aboriginal community well-being are expected to be effectively mitigated Table 17.5-3). No residual adverse effects are identified.

Table 17.5-3. Proposed Mitigation Measures and their Effectiveness

Potential Effect	Mitigation Measures	Effectiveness (Low/Moderate/ High/Unknown)	Residual Effect (Y/N)
Community Well-being			
Changes to worker stress and lifestyle choices	• Health and Wellness Management Plan • Employee and Family Assistance Program • Worker orientation and training • On-site access to communications • Workforce Transition Plan (at Closure phase)	High	No
Changes to family dynamics and family/community stress	• Employee and Family Assistance Program • On-site access to communications • Engagement with health and social service providers • Workforce Transition Plan (at Closure phase)	High	No
Aboriginal Community Well-being			
Changes to worker stress and lifestyle choices	• Health and Wellness Management Plan • Employee and Family Assistance Program • Worker orientation and training • On-site access to communications • Engagement with Aboriginal PACs • Aboriginal employment and training resources • Pre-recruitment information sessions • Workforce Transition Plan (at Closure phase)	High	No
Changes to family dynamics and family/community stress	• Employee and Family Assistance Program • On-site access to communications • Engagement with Aboriginal PACs • Engagement with health and social service providers • Pre-recruitment information sessions • Workforce Transition Plan (at Closure phase)	High	No

17.6. RESIDUAL PROJECT EFFECTS ASSESSMENT

Following the implementation of mitigation measures, no residual effects are identified for the social VCs of Community Well-being and Aboriginal Community Well-being.

17.7. CUMULATIVE EFFECTS ASSESSMENT

Cumulative effects are not predicted for the social VCs community well-being and Aboriginal community well-being. The methodology (Chapter 8) requires a determination of residual effect to inform the assessment of potential cumulative effects. As residual effects on the social environment have not been identified , no potential cumulative effects assessment was conducted.

17.8. CONCLUSIONS

With the implementation of mitigation measures as described in Table 17.5-3, the potential effects of the Project to community well-being and Aboriginal community well-being are expected to be reduced. Ultimately, the Project's social effects (i.e., "changes to family dynamics and family/ community stress" and "changes to worker stress and lifestyle choices") will largely be determined by individuals and their families who are engaged in Project employment. For the majority of Project employees, it is reasonable to assume employment and income will have a lasting positive effect. However, for a smaller group, particularly those who already struggle with social issues, there may be an adverse effect on worker stress and lifestyle choices, and/or family dynamics and family/community stress.

Potential adverse effects on well-being are linked to three factors of employment: higher than average incomes typical of mining jobs, the FIFO work schedule, and the nature of the on-site work environment. The mitigation and monitoring measures presented in this chapter are designed to address these factors and ensure that all employees—and their families and communities—are able to take advantage of the benefits of Project employment and manage potential adverse effects.

AuRico is committed to minimizing the potential for adverse effects and will implement the appropriate plans and programs to ensure that workers have access to the tools, resources, and information required to ensure the best outcomes for worker, family, and community well-being during the Construction and Operations phases of the Project. As a result, residual effects to community well-being and Aboriginal community well-being during the Construction and Operations phases are not anticipated.

Similarly, potential effects related to closure of the Project will also be effectively reduced through the development of a Workforce Transition Plan to help employees identify and secure new employment and prepare for the end of Project employment. Previously, the closure of the KS Mine was guided by a similar transition program, which was reported to be successful and appreciated by KS employees during the transition. As a result, residual effects on community well-being and Aboriginal community well-being are not anticipated during the Closure phase.

As no residual adverse effects are identified for community well-being or Aboriginal community well-being, potential cumulative effects are not assessed. Table 17.8-1 summarizes the mitigation measures, residual effects and cumulative effects for each social VC.

Table 17.8-1. Summary of Mitigation Measures, Residual and Cumulative Effects for the Social Environment

Residual Effects	Project Phase	Mitigation Measures	Significance of Effects	
			Residual	Cumulative
Community Well-being				
Changes to worker stress and lifestyle choices	Construction, Operations	• Health and Wellness Management Plan • Employee and Family Assistance Program • Worker orientation and training • On-site access to communications	No residual effects	No cumulative effects
	Closure	• Workforce Transition Plan	No residual effects	No cumulative effects
Changes to family dynamics and family/community stress	Construction, Operations	• Employee and Family Assistance Program • On-site access to communications • Engagement with health and social service providers	No residual effects	No cumulative effects
	Closure	• Workforce Transition Plan	No residual effects	No cumulative effects
Aboriginal Community Well-being				
Changes to worker stress and lifestyle choices	Construction, Operations	• Health and Wellness Management Plan • Employee and Family Assistance Program • Worker orientation and training • On-site access to communications • Engagement with Aboriginal PACs • Aboriginal employment and training resources • Pre-recruitment information sessions	No residual effects	No cumulative effects
	Closure	• Workforce Transition Plan	No residual effects	No cumulative effects
Changes to family dynamics and family/community stress	Construction, Operations	• Employee and Family Assistance Program • On-site access to communications • Engagement with Aboriginal PACs • Engagement with health and social service providers • Pre-recruitment information sessions • Engagement with health and social service providers	No residual effects	No cumulative effects
	Closure	• Workforce Transition Plan	No residual effects	No cumulative effects

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