



BC EAO EAC Application – Tenas Project

Section 6.0 Social Effects Assessment

Chapter 1 Demographics Valued Component

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Tenas Project

Section 6.0 Social Effects Assessment Chapter 1 Demographics Valued Component

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ABBREVIATIONS AND ACRONYMS

Abbreviation or Acronym	Long Form of Abbreviation or Acronym
AANDC	Aboriginal Affairs and Northern Development Canada
AIR	Application Information Requirements
BC	British Columbia
BC EAO	British Columbia Environmental Assessment Office
BC MFLNRORD	British Columbia Ministry of Lands, Natural Resource Operations and Rural Development
BMPs	best management practices
C	Chapter
C&M	care and maintenance
CCP	Comprehensive Community Plan
CEA	cumulative effects assessment
Crossroads	Crossroads Cultural Resource Management
CUS	Cultural Use Study
EA	environmental assessment
EAA	<i>Environmental Assessment Act</i> , SBC 2002, c 43 (Government of British Columbia [GovBC] 2002)
EAC	Environmental Assessment Certificate
FIFO	Fly-In-Fly-Out
FTEs	full-time equivalents
GovBC	Government of British Columbia
HEC	Human Ecology Consulting Inc.
INAC	Indian and Northern Affairs Canada
IOM	Input-Output Model
ISET	Indigenous Skills and Employment Training Program
LHA	Local Health Authority
LNG	liquified natural gas
LSA	Local Study Area
MPI	Major Projects Inventory
NHS	National Household Survey
OW	Office of the Wet'suwet'en
PAG	potentially acid generating
P.E.O.P.L.E.	Population Extrapolation for Organizational Planning and Less Error
Project	Tenas Project
RFP	Request for Proposal

Abbreviation or Acronym	Long Form of Abbreviation or Acronym
ROW	right-of-way
S	Section
SEMP	Socio-Economic Management Plan (S13.0-C16)
RDBN	Regional District of Bulkley Nechako
RSA	Regional Study Area
TCL	Telkwa Coal Limited
TK	Traditional Knowledge
VC	Valued Component

UNITS OF MEASURE

Abbreviation	Long form of Abbreviation or Acronym
\$	dollar
%	percent
ft ²	square feet
km	kilometre
km ²	square kilometres
kV	kilovolt
V	volt

EXECUTIVE SUMMARY

This chapter provides an assessment of potential interactions between the Tenas Project (Project) and the Demographics Valued Component (VC). Project employment, contracting and procurement, and other induced local and regional economic effects may contribute to change in local and regional demographics.

Stakeholder engagement and consultation, collection of secondary census data, and preparation of the British Columbia (BC) Input-Output Model (IOM) informed related issues scoping, selection, and assessment of the Demographics VC (Demographics). Key themes of interest identified through consultation and review of other data included potential changes in population and community composition during Project Construction, and Operation phases. It was recognized that evaluation of these potential changes could support and inform assessment of multiple potential social and economic effects including potential effects on Community Well-being, Infrastructure and Services, Land and Resource Use, Economic Development, and Labour Market VCs. A change in population and related demographic factors could also inform assessment of potential effects on Indigenous rights and interests.

Spatial boundaries for the assessment of potential effects on Demographics include the Local Study Area (LSA) defined to include Village of Telkwa, Town of Smithers, District of Houston, and the community of Witset (formerly Moricetown); and the Regional Study Area (RSA) defined to encompass the RDBN and the community of Witset. The assessment of Project-related effects and cumulative effects was conducted according to the methods set out in **Section (S) 3.0 Assessment Methodology** of the **Environmental Assessment Certificate (EAC) Application**.

The assessment conducted in this chapter identified one (1) potential adverse effect on Demographics resulting from the proposed Project. During the Construction, and Operation phases, Project employment and spending could lead to a change in population and related demographic factors, including composition of the communities (e.g., age and gender), and contribute to other effects assessed by supported VCs.

The Project utilizes a modular design of Mine Infrastructure to reduce the Construction Phase workforce. Mitigation measures to minimize changes in population and related demographic factors during the Construction, and Operation phases include a strategy focused on maximizing employment of a resident local workforce. TCL will establish temporary Project recruitment offices in Telkwa, Smithers, Houston, and Witset prior to commencement of the Construction Phase and will host Employment Information Sessions in LSA/RSA communities during the Construction Phase. Specific mitigation measures to address barriers to Indigenous employment and participation in Project-related economic benefits include creating a Health, Safety, and Human Resources Superintendent role at the Project to support employment opportunities for Indigenous people.

The small, short-term, and temporary nature of an in-migration of population during the Construction Phase was considered fully mitigated and was not carried forward in consideration of residual effects. With implementation of mitigation measures during the Operation Phase, the residual effect predicted for Demographics includes:

- ▶ an increase in population and a change in related demographic factors.

This change is expected to substantially decrease during the Decommissioning and Reclamation, and Post-Closure phases.

After characterisation, the adverse residual effect of the Project was predicted to be **Not Significant**. With a focus on employment of a local resident workforce, the change in population is predicted to be small and

changes to demographic composition of communities to diminish over the life of the Project. The adverse residual effect was carried forward for cumulative effects assessment (CEA). The CEA considered past, present, and reasonably foreseeable future projects and activities that could interact with the Project. Assessment determined that while there is potential for present and future projects and activities to cumulatively interact with the Project, there is uncertainty surrounding the number of potential future projects that will be realized, and the effect of Project-related in migration of population is reasonably accounted for by provincial government population projections. While a residual cumulative effect is predicted, it is rated as **Not Significant**.

A **Socio-Economic Management Plan (S13.0-Chapter [C] 16) (SEMP)** was developed as part of the EAC Application to outline processes related to planning and monitoring of required Project engagement and consultation, to monitor the predicted Project effects, to investigate the efficacy of the introduced mitigation measures, and to propose and develop new mitigation measures if needed.

1. INTRODUCTION

This chapter is an analysis of potential interactions between the Tenas Project (Project) and the Demographics Valued Component (VC). Project employment, contracting and procurement, and other induced local and regional economic effects may contribute to changes in local and regional demographics. This chapter of the Environmental Assessment Certificate Application (EAC Application) presents an assessment of the potential effect of changes to population and other related demographic factors on the Demographics Valued Component (VC). Project-related effects on Demographics contribute to the potential pathways of effects of the Project, with other VCs being the ultimate receptors of those effects. These linkages are described in **3.2 Rationale for Selection of the Demographics Valued Component**.

The assessment proceeds as follows:

- ▶ **Regulatory Context:** The key role demographic data and population forecasting plays in land use and community planning is discussed;
- ▶ **Scope of the Assessment:** The assessment of Demographics includes assessment of Project-related effects and cumulative effects and is based primarily on publicly available census and other data collected by governments of Canada and British Columbia (BC);
- ▶ **Existing Conditions:** The approach taken in characterisation of demographic existing conditions has included literature review and desktop research. Demographic existing conditions are based on data compiled and described in the **Socio-economic Baseline Report (Appendix 5.1-A of Section (S) 5.0-Chapter (C) 1 Labour Market VC)** and the **Cultural Use Study (CUS)** presented in **Appendix 7.1-B of S7.0-C1 Heritage Resources VC)**, as well as other publicly available studies and sources. Relevant data used in other project assessments was also considered. Characterisation of demographic existing conditions includes comments made in interviews conducted during baseline data collection and reviews of available demographic data on affected Indigenous communities within the Local Study Area (LSA);
- ▶ **Assessment of Project-related Effects:** Potential Project-related changes to population will be assessed by way of publicly available population projections and Project-related labour force predictions to determine whether changes could result in adverse effects. Upon identification of adverse effects, mitigation measures are outlined to eliminate or control them, and any subsequent residual effects are described and assessed;
- ▶ **Cumulative Effects Assessment (CEA):** Potential interactions between residual effects due to the Project and residual effects due to other past, present, or future projects or activities are identified and assessed to determine if residual cumulative effects are likely to occur. Upon identification of adverse changes, additional mitigation measures are considered, and any subsequent cumulative effects are described and assessed; and
- ▶ **Follow-up Strategy:** When adverse changes are identified and mitigated, a process of monitoring and adaptive management is considered.

2. REGULATORY CONTEXT

The Application Information Requirements (AIR) for the Project, approved by the British Columbia Environmental Assessment Office (BC EAO) in 2022, outlines the requirements of the EA for Demographics to meet the provincial environmental assessment (EA) requirements under the BC *Environmental Assessment Act*, SBC 2002, c 43 (Government of British Columbia [GovBC 2002] (EAA)). The assessment of Demographics follows these guidelines and legislated requirements and is consistent with the requirements of the Project AIR.

Population and demographic data are key in the identification, design, and delivery of a wide range of government services. Demographics are used in a variety of ways, from regional land use and community social planning, to determining needs for emergency, health care and social services. Changes in population size and composition directly influences community governance and demand for community services, infrastructure, and resources. Demographic information collected by federal census and through provincial data collection, reporting, and forecasting provide a basis for the development of government programming and funding of federal, provincial, regional, and local services and infrastructure. The Demographics assessment makes use of these data sources and considers these regional and community plans.

3. SCOPE OF THE ASSESSMENT

The effects assessment for Demographics, including the assessment of Project-related effects and cumulative effects was conducted in accordance with the methods set out in **S3.0 Assessment Methodology** of the **EAC Application**. The assessment is based primarily on publicly available census and other data collected by governments of Canada and BC. This information has been supplemented by Project-specific studies and socio-economic field studies. When available and relevant, studies undertaken for other projects or for regional or community-specific reports have also been included. Publicly available traditional and local community knowledge has been considered, including the **CUS (Appendix 7.1-B)**. The Demographics spatial and temporal boundaries are described in **3.2.4 Assessment Boundaries**.

Population changes are assessed by estimating the incremental change observed from existing conditions. Project-related population estimates are driven by workforce predictions as discussed in **4.2 Description of Existing Conditions**, and the results from the economic BC Input-Output Model (IOM) of induced labour market changes presented in **S5.0-C1 Labour Market VC**. Where potential adverse effects are anticipated, mitigation measures are proposed to eliminate or minimize the severity of effects, and some measures may increase expected positive effects. Residual effects are then characterised and evaluated for Significance as per criteria described in **5.4 Residual Effects and Significance of Residual Effects**.

3.1 Issues Scoping

Telkwa Coal Limited (TCL) has undertaken an engagement and consultation process to support the scoping of issues for the Project. Refer to **S11.0 Wet'suwet'en Rights and Interests Assessment** and **S12.0 Public Consultation** for details on the consultation and engagement program. The consultation and engagement process has included Working Groups established with Indigenous groups, government departments, community meetings, one-on-one and small group meetings, and socio-economic baseline field study interviews.

This engagement process highlighted various interests, including potential employment opportunities, issues around demand and availability for housing, and the use of local infrastructure and community services as topics of interest for residents in the LSA and RSA. Study of local and regional demographic trends was initiated to better understand how Project-induced changes in population may affect these topics of interest.

3.2 Rationale for Selection of the Demographics Valued Component (VC)

Demographics was selected during the pre-Application phase of the Project following the VC selection process set out in **S3.0-C1-2.4.1 Selection of Valued Components** and used the methodology provided in the Guideline for Selection of Valued Components and Assessment of Potential Effects (BC EAO 2013).

3.2.1 Valued Components (VC)

Demographics was selected as a VC because the change in population and other demographic factors are measurable parameters and support (i.e., informs) the assessment of several social and economic effects for other VCs such as:

- ▶ **Infrastructure and Services VC (S6.0-C3):** a change in population related to Project employment can have implications on availability of housing and the provision of public services;

- ▶ **Land and Resource Use VC (S6.0-C4):** a change in population can affect or change existing land and resource uses;
- ▶ **Community Well-being VC (S6.0-C5):** vulnerable groups (such as Indigenous people) may experience barriers to employment at the Project and be excluded from economic benefits, resulting in adverse effects on their well-being;
- ▶ **Labour Market (S5.0-C1):** a change in population and other demographic factors resulting from the Project can impact existing labour market conditions; and
- ▶ **Economic Development VC (S5.0-C2):** a change in population and other demographic factors may change the level of economic development in the region.

Table 3.2.1 summarizes the rationale for selection of the Demographics VC. Further information is available in the **Socio-economic Baseline Report (Appendix 5.1-A of S5.0-C1 Labour Market VC)**.

Table 3.2-1: Summary of Rationale for Selection of Demographics Valued Component (VC) and Linkages

VC	Rationale for Inclusion	Source of Information	VC Linkages
Demographics	Potential Project effects related to a change in population or other demographic factors	▪ Federal census data ▪ Provincial population data and projections ▪ Regional labour market studies ▪ Socio-economic baseline field studies ▪ Economic BC Input-Output Model (IOM) ▪ Research and data gathered from other relevant projects	Supporting: ▪ Infrastructure and Services ▪ Land and Resource Use ▪ Community Well-being ▪ Labour Market ▪ Economic Development

Notes: BC=British Columbia; VC=Valued Component

3.2.2 Subcomponents

No subcomponents were selected or required for the Demographics VC.

3.2.3 Indicators

The indicator for analysis of the Demographics VC (**Table 3.2-2**) is the potential for the Project to affect populations in the LSA and RSA in relation to the Infrastructure and Services, Land and Resource Use, Community Well-being, Labour Market and Economic Development VCs.

Table 3.2-2: Indicators for Demographics Valued Component (VC)

Indicator	Rationale for Selection
Change in population and other demographic factors	Assessment of how a change in population and other demographic factors may have an adverse or beneficial effect on the use of Infrastructure and Services, Land and Resource Use, Labour Market, Community Well-being and Economic Development Valued Components (VCs) within the Local Study Area (LSA) and Regional Study Area (RSA).

3.2.4 Assessment Boundaries

Spatial and temporal boundaries for Demographics were selected based on the proximity of identified communities to the proposed Project Area, and their anticipated interaction with Project activities during all phases. Consideration was given to the potential economic and socio-community effects of the Project, noting that Project-induced changes in population, employment, contracting, procurement and other economic conditions (e.g., labour market supply, demand, and production systems) are typically pathways to related social and economic effects. For consistency in the assessment, selection of study areas also considered administrative and technical boundaries with respect to the availability of existing conditions data and how the data was organized.

3.2.4.1 Spatial Boundaries

Demographics has adopted an LSA and RSA (**Table 3.2-3; Figure 3.2-1**) as described in the **Socio-economic Baseline Report (Appendix 5.1-A of S5.0-C1 Labour Market VC)**.

Table 3.2-3: Spatial Boundary Definitions for Demographics Valued Component (VC)

Spatial Boundary	Description of Study Area
Local Study Area (LSA)	Telkwa, Smithers, Houston, and Witset (formerly Moricetown)
Regional Study Area (RSA)	Regional District of Bulkley Nechako (RDBN) and the community of Witset

The LSA comprises the Village of Telkwa, Town of Smithers, the District of Houston, and the community of Witset¹ (formerly Moricetown). Based on their relatively close proximity and daily and short commuting range to the Project, as defined as approximately a one half hour commute one-way, it is anticipated that residents of these communities are likely to be directly influenced to varying degrees by socio-economic effects during its Construction, Operation, Decommissioning and Reclamation, and Post-closure phases.

Similarly, it is anticipated that the socio-economic indicator, changes in population, will contribute to assessment of related Project effects on Labour Market, Economic Development, Infrastructure and Services, Land and Resource Use, and Community Well-being VCs.

The RSA comprises the Regional District of Bulkley-Nechako (RDBN) and the community of Witset. Within the RDBN, Project-related effects on Demographics are expected to be less direct but provide regional context for the availability of human resources, supplies, and services. The RSA reflects a regional dependency on natural resources, resource development, agriculture and tourism for employment, and economic opportunities. The RSA includes LSA communities and the rural electoral areas of Smithers (Electoral Area A) and Houston (G), as well as Burns Lake (B), Fort St. James (C), Fraser Lake (D), Francois/Ootsa (E), and Vanderhoof (F). Wet'suwet'en traditional territory is also located within the RSA.

¹ The community of Witset is located outside the RDBN. Witset (formerly Moricetown) comprises four (4) occupied and adjacent reserves of the Witset First Nation, a member of the Wet'suwet'en Nation as represented by the Office of the Wet'suwet'en (OW). Statistical data for Witset is based on data for Moricetown 1, Coryatsaqua (Moricetown) 2, Bulkley River 19, and Babine 17 as those Indian Reserves have residences; however, the Witset First Nation also has two (2) other Indian Reserves, Oschawwinna 3 and Jean Baptiste 28, that are mostly undeveloped and forested areas, with some land used for agricultural uses (Witset First Nation 2018). The OW is identified in the Project's Section 11 Order as a Schedule A Indigenous Group requiring on-going consultation and engagement. Accordingly, Witset is included in the LSA and RSA.

The spatial boundaries of the CEA for the Demographics VC include the LSA (defined to include Village of Telkwa, Town of Smithers, District of Houston, and Witset); and the RSA (defined to encompass the RDBN and Witset).



3.2.4.2 Temporal Boundaries

Temporal boundaries reflect the periods of time during which Project activities could reasonably be expected to potentially affect population and demographics, as described in **S1.0 Overview of Project Proponent Description**. These include the Construction, Operation, Decommissioning and Reclamation, and Post-closure phases (**Table 3.2-**).

Table 3.2-4: Temporal Boundaries for the Tenas Project

Phase	Year	Duration (years)	Description of Activities
Construction	-0.5 to 0	1.5	Site clearing, soil salvage, open pit development, building construction, service and haul road development, Rail Infrastructure construction, bridge construction and development of onsite utilities and services. Development of mine rock, and overburden storage piles, stockpiling of reclamation material such as soil, overburden and other materials suitable for reclamation. Development of water management systems and management ponds for storage of potentially acid generating (PAG) materials.
Operation	1 to 21	21	Development of the open pit through drilling, blasting, loading, and hauling functions. Development of mine rock, and overburden storage piles, stockpiling of reclamation material such as soil, overburden, and other materials suitable for reclamation. Development of water management systems and management ponds for PAG storage. Conducting coal processing, stockpiling of raw coal prior to processing, and stockpiling of processed coal prior to shipping. Progressive reclamation will be accomplished during operation including, where available, reclamation activities such as sloping, topsoil placement and revegetation.
Decommissioning and Reclamation	22 to 25	4	Tear-down of infrastructure onsite plus reclamation activities, including sloping of storage piles, backfill materials, and placement of reclamation materials including growth media, overburden and non-PAG rock for management pond covers and revegetating surfaces that are planned to be reclaimed.
Post-closure	26 to 50	10	Active: This involves the filling of the open pit with water, monitoring of vegetation growth and water quality for both groundwater and surface water and wildlife. Control and sedimentation ponds may still be needed for settling of total suspended solid levels. The management ponds are left as dry land reclamation except for portions that will be left as open water.
		15	Passive: This stage is when the control and sedimentation ponds are no longer required for settling of total suspended solid (TSS) levels and the management ponds are left as dry land reclamation except for portions that will be left as open water. Telkwa Coal Limited (TCL) is now simply monitoring the site.

3.2.4.3 Administrative Boundaries

Administrative boundaries relate to the designated political and social responsibilities and legislative authorities within designated geographic regions that constrain the availability of data. Federal census population and demographic information is mandated by the *Statistics Act*, R.S.C., 1985, c.S-19 (GovCan

1985). Provincial population and demographic information is collected by several BC government departments and regional authorities. Population projections are provided by BC Stats through the authority of the BC Minister for Jobs, Economic Development and Competitiveness. Some LSA and RSA data were available for individual communities or electoral areas identified in the federal census. Other data sources were only available at a regional or Local Health Authority (LHA) level.

3.2.4.4 Technical Boundaries

Technical boundaries for assessment of Demographics are related to limitations in the statistics and information available to characterise existing conditions and the Project workforce. Estimates based on available population information have been made, but in some cases, as noted below, data rounding errors or data suppression, especially in smaller and Indigenous communities, may affect specific counts or their accuracy. Municipal boundaries may also serve to undercount the number of residents of municipalities, in particular Smithers and Houston, if residents live outside of the boundaries used for census data collection. Within the RSA, the rural Electoral Areas of Smithers (A) and Houston (G) overlap LSA communities, but do not include the Indigenous community of Witset, which is outside of the RDBN. While community population and demographic data is available to some extent, population projections are not. Projections are only available at a regional level, covering the period from 2006 to 2041, two (2) years prior to the end of the Operation Phase of the Project as currently scheduled. Information on the Village of Witset (formerly Moricetown) was limited from federal and provincial data sources. Witset population information is compiled from census data for four adjacent reserves occupied by Witset First Nation members or taken from available community planning documents. Population estimates and projections for Witset have been presented separately.

Wet'suwet'en population information is also limited by a number of factors. Statistical population data pertaining to Wet'suwet'en communities derived from the federal census and the 2011 National Household Survey (NHS) (Statistics Canada 2013a) is incomplete, due to small population sizes and/or low survey participation rates. To some extent, information collected by NHS has been rounded or suppressed to protect identifiable individuals. Federal, provincial, and community data sources indicate slightly differing population numbers, or divide population reporting using dissimilar means (e.g., some sources list the percentage of on and off reserve Wet'suwet'en community members, while others do not).

4. EXISTING CONDITIONS

This subsection provides an overview of existing conditions with respect to historic, current, and future population and demographics within the RSA and LSA. Description of demographics includes any relevant references to Traditional Knowledge (TK) and utilizes social scientific baseline studies and economic modeling data undertaken for the Project. Demographic factors as they relate to community composition, such as the age or gender of residents, are provided when available.

4.1 Background Information and Studies

This subsection describes the existing conditions of Demographics based on TK, scientific and other information, and baseline studies undertaken for the Project. The information in this section establishes the context for the assessment of effects on the VC.

4.1.1 Traditional Knowledge (TK)

The assessment of Demographics makes use of population and demographic information provided the Witset First Nation Comprehensive Community Plan and Land Use Plan (Witset First Nation 2018). The **CUS (Appendix 7.1-B)** compiled a baseline inventory of cultural heritage resources pertaining to Wet'suwet'en communities by examining pre-existing cultural, social, historic, and economic data (Crossroads Cultural Resource Management [Crossroads] 2021). TK referenced in these plans and study have been included in the assessment as appropriate.

4.1.2 Scientific and Other Information

The assessment considered various existing scientific and other information, and its applicability to the Project. A primary source of information was Statistics Canada 2016 and 2011 census data (Statistics Canada 2017a; 2011), supplemented by the 2011 NHS (Statistics Canada 2013a), Aboriginal Affairs and Northern Development Canada (AANDC) First Nations Profiles (Indian and Northern Affairs Canada [INAC] 2018a-d), community plans, and provincial, regional and local reports. Population forecasts were provided by an application available on the BC Stats website (BC Stats 2020). While the population data is generally reliable, data limitations exist due to census gaps, rounding and data suppression, especially for smaller and Indigenous communities. The BC Labour Market Outlook 2018 Edition (GovBC 2019a) was reviewed, and it was determined that it did not contain information relevant to the Demographics VC. However, the 2019 Edition (GovBC 2019b) was used in S5.0-C1 Labour Market VC.

The **CUS (Appendix 7.1-B)** was an additional source of demographic information for Wet'suwet'en residents in the RSA/LSA.

Information on the Village of Witset (formerly Moricetown) from federal and provincial data sources was limited. Moricetown 2016 census data has been supplemented by information provided in the Witset First Nation Comprehensive Community Plan, Land Use Plan (Witset First Nation 2018). Data on Witset was supplemented in fall 2020 through semi-structured interviews conducted with Witset First Nation administrators and other key informants.

4.1.3 Baseline Studies

Table 4.1-1 summarizes the existing conditions report and other key studies considered in the assessment of the Demographics VC.

Table 4.1-1: Summary of Desktop and Field Studies Related to the Demographics Valued Component (VC)

Study Name	Study Purpose, Duration and Spatial Boundaries
Socio-economic Baseline Report (Appendix 5.1-A of S5.0-C1 Labour Market VC) and field studies	The desktop study was compiled from 2019 to 2020 and includes federal census and other data and information from provincial government and regional sources. The report also includes comments made by residents and key informants in the RSA and LSA during socio-economic existing conditions field study interviews. Socio-economic field studies were conducted from 2019 to 2021. Key informant interviews were carried out with community leaders, administrators, and managers responsible for a range of social and economic issues, programs, and/or facilities. Notes and other information gathered during interviews were primarily used to qualitatively supplement statistical information and to contextualize understanding of existing issues and concerns in the communities.
Cultural Use Study (Appendix 7.1-B of S7.0-C1 Heritage Resources VC)	From publicly available sources, the desktop study compiles a baseline inventory of cultural heritage resources pertaining to Wet'suwet'en communities in the RSA and LSA. The study includes an examination of pre-existing cultural, social, historic and economic data.

Notes: C=Chapter; LSA=Local Study Area; Project=Tenas Project; RSA=Regional Study Area; S=Section; VC=Valued Component

4.2 Description of Existing Conditions

This subsection provides a summary of population and demographic information for the RSA and LSA relating to assessment of Demographics, as it informs potential effects on the socio-economic VCs listed in **3.2.1 Valued Components**. The summary includes available existing population and demographic information from sources listed in **4.1 Background Information and Studies**. Existing conditions data focuses on the LSA communities as most likely to be affected by changes in population and other demographic factors related to the Project given their proximity and within a reasonable commuting distance. Demographic data for RSA communities, including Indigenous communities, that are more likely to be at most indirectly affected are included for context and comparative purposes.

4.2.1 Regional Study Area (RSA)

In 2016, the RSA population (RDBN, excluding the community of Witset), was 37,896, a 3.3 percent (%) decrease from 2011. The population was roughly evenly split between residents that identify as male (19,355 or 51%) and female (18,540 or 49%). 19.6% of the RDBN's population identifies as Indigenous (7,435). Visible minorities made up 3.3% of the population in the RDBN, well below the 30.2% in the provincial population. The median age of residents of the RDBN is 41.1 (41.0 for males and 41.3 for females) (Statistics Canada 2017b). **Table 4.2-1** summarizes key 2016 RSA population and demographic data (excluding Witset; see **4.2.3 Indigenous Community Demographics** and **Table 4.2-6** for Witset population and population projections).

Table 4.2-1: Regional District of Bulkley-Nechako (RDBN) Population and Demographic Summary (2016)

	Total	Male	Female
Population 2016	37,896	19,355	18,540
Population 2011	39,208	19,825*	18,675*
Population 2006	38,242	-	-

	Total	Male	Female
Age (2016)			
0 to 14 years (%)	19.2	19.5	19.0
15 to 64 years (%)	65.9	65.8	65.9
65 years and over (%)	14.9	14.6	15.1
Median age	41.1	41.0	41.3
Average Size of Census Family (2016)	2.9	-	-
Aboriginal Identity	7,435	3,795	3,640
Visible Minority	1,270	600	670

Source: Statistics Canada 2013b, 2017b

Note: %=percent

*2011 NHS total population (38,940) and gender breakdown differs from 2011 census data due to confidentiality data suppression. 2006 gender data not available.

As **Table 4.2-2** indicates, the RSA population, excluding Witset, decreased by 3.3% between 2011 and 2016. The greatest decreases in population occurred in Burns Lake, Fort St. James, Fraser Lake and to a lesser extent Houston. Witset's population declined 1.1% over the same period.

Table 4.2-2: British Columbia (BC) and Regional District of Bulkley-Nechako (RDBN) Population Change (2011–2016)

Area	Population 2011	Population 2016	2011-2016 % Change
British Columbia	4,400,057	4,648,055	5.6
RDBN (Census Division)	39,208	37,896	-3.3
Smithers	5,404	5,401	-0.1
Telkwa	1,350	1,327	-1.7
Burns Lake	2,029	1,779	-12.3
Fort St. James	1,691	1,598	-5.5
Fraser Lake	1,167	988	-15.3
Vanderhoof	4,480	4,439	-0.9
Gransle	303	303	0.0
Houston	3,147	2,993	-4.9
Witset	693*	660*	-1.1

Source: Statistics Canada 2016; *Witset First Nation 2018; Human Ecology Consulting Inc. (HEC) 2020

Note: %=percent; RDBN= Regional District of Bulkley-Nechako

Table 4.2-3 provides the age distribution for the RDBN, compared to the BC population as a whole. In 2016, the median age in the RDBN was 41, slightly younger than the population of BC (43). Between 2011 and 2016, the portion of the RDBN's population aged 20 to 24 shrunk by 30%, while during this same period

there was an increase in RDBN population aged 30 to 34 by almost 10% (Human Ecology Consulting Inc. [HEC] 2020).

Table 4.2-3: Regional District of Bulkley-Nechako (RDBN) and British Columbia (BC) Age Distribution (2016)

Age Group	% of RDBN Population	% of BC Population
0 to 14	19.2%	14.9%
15 to 64	65.9%	66.9%
55 to 64	15.9%	14.6%
65+	14.9%	18.3%

Source: Statistics Canada 2017b; Human Ecology Consulting Inc. [HEC] 2020

Notes: BC=British Columbia; RDBN= Regional District of Bulkley- Nechako; %= percent

Table 4.2-4 indicates that between 2011 and 2016, approximately 6,045 people moved to the RDBN. This represents about 16% of the RDBN total population. Just over 3/4 of recent in-migrants moved to the RDBN from elsewhere in BC, while 16.8% moved from a different Canadian province and 7.9% moved from abroad. Smithers and Vanderhoof were the most common places of residence in 2016 for in-migrants who moved to the RDBN during this period (HEC 2020).

Table 4.2-4: Regional District of Bulkley-Nechako (RDBN) In-migrants (2011-2016)

Place of Residence 5 Years	Total In-migrants to RDBN	% of Total In-migrants	% of Total RDBN Population
Inter-provincial Migrants	1,015	16.8	2.7
Intra-provincial Migrants	4,550	75.2	12
External Migrants	480	7.9	1.3

Source: Human Ecology Consulting Inc. (HEC) 2020

Notes: %=percent; RDBN=Regional District of Bulkley- Nechako

4.2.2 Local Study Area (LSA)

Table 4.2-5 summarizes key population and demographic data for LSA communities. **Figure 4.2-1** shows population changes in the LSA from 2001 to 2016. Within the LSA, populations have stayed relatively stable over this 15 year period, with Houston recording the largest decrease in residents during this period (-4.9%).

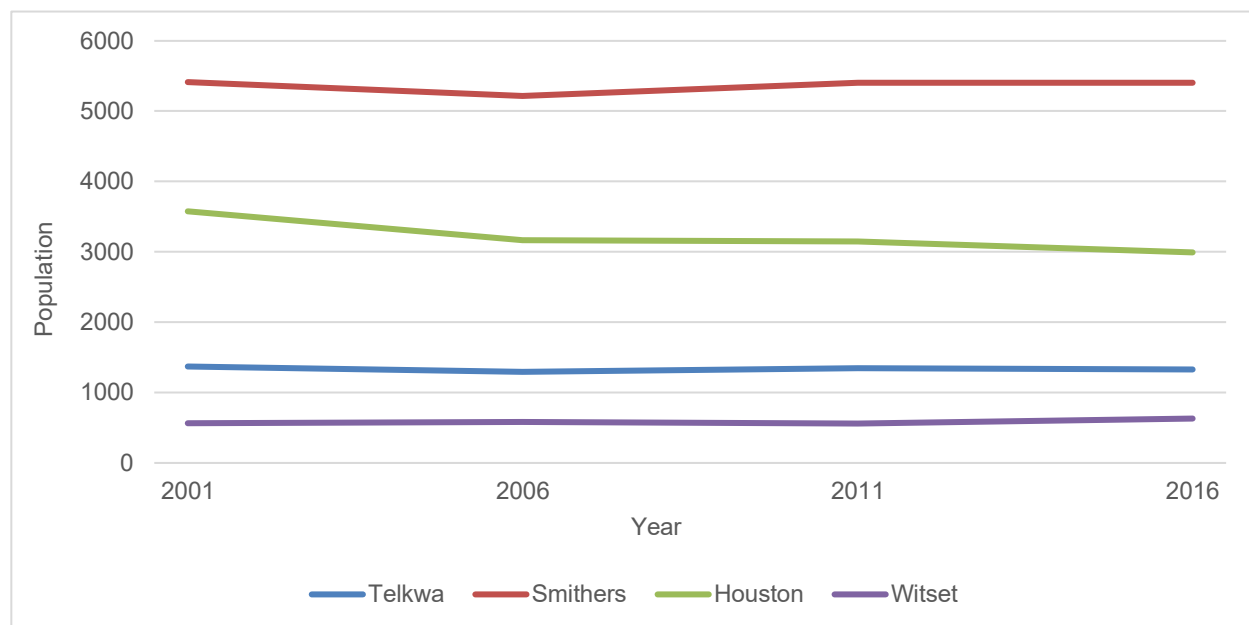
Table 4.2-5: Local Study Area (LSA) Population and Demographic Summary (2016)

	Telkwa	Smithers	Houston	Witset
Population 2016	1,327	5,401	2,993	660*
Population 2011	1,350	5,404	3,147	693*
Age (2016)				
0 to 14 years (%)	22.6	18.1	20.7	-
15 to 64 years (%)	67.4	66.0	65.2	-

	Telkwa	Smithers	Houston	Witset
65 years and over (%)	10.1	15.8	14.0	-
Median age	36	39	40.8	-
Average Size of Census Family (2016)	2.7	2.3	2.4	-
Aboriginal Identity	95	555	495	-
Visible Minority	0	340	160	-

Source: Statistics Canada 2017c, 2017d, 2017e; *Witset First Nation 2018

Note: %=percent



Source: Statistics Canada 2017c, 2017d, 2017e, 2017f, 2017g, 2017h

Figure 4.2-1: Local Study Area Population Change 2001-2016

4.2.3 Indigenous Community Demographics

The Wet'suwet'en traditional territory constitutes approximately 22,000 square kilometres (km²) of land located for the most part within the RDBN, with the Wet'suwet'en community of Witset located just outside of this regional administrative boundary. Of the RSA's total population of 37,896, 19% identified as Aboriginal² (Statistics Canada 2017b). Of these 7,435 people, roughly 5,000 are Wet'suwet'en (British Columbia Ministry of Forests, Lands, Natural Resource Operations and Rural Development [BC MFLNRORD] 2017). This population resides in First Nations communities (Wet'suwet'en Village, Witset

² The term Aboriginal is the designation used by Statistics Canada in its census data. Aboriginal and Indigenous are used interchangeably in this assessment.

[formerly Moricetown], Hagwilget, Nee-Tahi-Buhn, and Skin Tyee), their reserves, or off-reserve in larger communities (e.g., Houston, Smithers, Telkwa, and Burns Lake) or other rural areas.

In 2018, Witset First Nation reported a total membership population of 2,040 members, of which approximately 32% lived on Witset reserves, with the rest living on other reserves or off-reserve throughout BC and Canada (Witset First Nation 2018). The 2016 census includes 635 Indigenous persons living on-reserve in Witset (Statistics Canada 2018a), including 305 Indigenous persons in Moricetown 1 IR (Statistics Canada 2018b), and 190 Indigenous persons on-reserve in Hagwilget (Statistics Canada 2018c, 2018d). The OW indicates that Witset is home to approximately 661 on-reserve and 1129 off-reserve members, for a total population of 1,790 (**Appendix 11-B of Part C-S11.0 Wet'suwet'en Rights and Interests Assessment. Table 4.2-6** provides Witset First Nation population data and projections, as described in the community's Comprehensive Community Plan (CCP) (Witset First Nation 2018).

Table 4.2-6: Witset First Nation Population and Projections

	2006	2011	2018	2028 (forecast)	2038 (forecast)
Total Registered Membership*	1,787	1,921	2,040	2,281-2,550	2,550-3,188
% Members Living On-reserve	37%	36%	33%	33% (assumed)	33% (assumed)
On-reserve Members	660	693	660	753-842	842-1,052
Off-reserve Members	1,127	1,228	1,380	1,528-1,709	1,708-2,136

Source: Witset First Nation Comprehensive Community Plan (CCP) (Witset 2018).

Note: %=percent

*Total Registered Membership includes members living off-reserve or a non-Witset First Nation reserve.

Census data drawn from NHS for Wet'suwet'en Nation communities indicates that the populations of Witset and Skin Tyee have increased since 2006. Witset's total population grew 18.7% between 2006 and 2011, and Skin Tyee's population increased 20% between 2006 and 2011 (INAC 2018a, 2018b). Hagwilget Village, however, saw an overall decline in population since the 2006 census, with a 13% decrease between 2006 and 2011 (INAC 2018c). Population change data were not available for Nee-Tahi-Buhn (INAC 2018d). The community of Witset predicts continued membership growth between 1.2 to 2.5% annually (Witset First Nation 2018).

In recent years, Witset's population has been aging, with 11% of on-reserve members over the age of 65, up from 5% in 2010. Overall, however, Witset's on-reserve population remains young, with 59% of members being under the age of 40. The average number of persons per household in Witset is 2.9, and housing is predominantly single family (Witset First Nation 2018).

Wet'suwet'en First Nation has around 140 members (roughly half on-reserve, half off-reserve), and Skin Tyee has 134 members total on and off-reserve (Office of the Wet'suwet'en [OW] 2020b, 2020c). The OW does not have population data for Nee-Tahi-Buhn (or Hagwilget) publicly available. As of 2013, Nee-Tahi-Buhn had a total membership of 135 individuals, with 55 persons living on-reserve (OW 2013a), and Hagwilget had a total population of 706, with 221 persons living on reserve (OW 2013b).

4.2.4 British Columbia (BC) Population Projections

Population Extrapolation for Organizational Planning and Less Error 2020 (P.E.O.P.L.E.) is BC Stat's latest annual population projection model. The projection covers the years 2020 to 2041, with information available for numerous provincial geographies including LHA, Health Service Delivery Area, Health Authority, School District, College Region, Regional District, and Development Region (BC Stats 2020). In this new set of BC population projections, all historical population figures for all geographic types were revised significantly due to the adjustments made for the census-undercounting correction. As a result of this correction, BC's total population in the year of 2016 now shows approximately 100,000 more persons than the un-adjusted census figures previously reported.

It is expected that the BC population will grow at a reduced rate of 1% over the 2020/21 period due to the impact of COVID-19 on migration to and within Canada. The annual rate should then recover to 1.3% during the next few years before the growth rate gradually declines to about 0.9% at the end of the projection period. BC's population is expected to increase from a total of 5,139,568 persons in 2020 to 6,515,558 in 2041. **Table 4.2-7** provides population projections for the Nechako Development Region and the province as a whole.

Table 4.2-7: British Columbia (BC) Population Projections

	Population as of July 1 ('000s)			Average Annual Growth Rate (%)
Development Region	2020	2030	2041	2020-2041
Nechako Development Region*	38	45	52	1.4
British Columbia Total	5,140	5,820	6,516	1.1

Source: BC Stats 2020

Note: %=percent

*The Nechako Development Region includes the Regional District of Bulkley-Nechako (RDBN) and the Stikine Regional District (Nechako Development Region 2019)

BC Stats projections indicate as BC's population continues to age the relative proportion of senior population will increase. In 2020, the number of persons aged 65 and older was estimated at 985,812 persons, accounting for approximately 19% of all the residents in BC. Senior population is projected to steadily increase to represent almost 25% of all BC residents (or 1,607,284 persons) in 2041. This will represent a 63% growth of senior population between 2020 and 2041 (BC Stats 2020).

By comparison, the proportion of working age population in BC will be declining more slowly over the next 20 years. In 2020, the proportion of population aged 20-64 (workers) represented approximately 61% of the province's overall population. However, the number of BC workers, while increasing in number over time, will be growing slower than that of the senior population. The proportion of worker population will only account for 58% of all BC residents by 2041. The dwindling trend of worker population, combined with the expectation of a relatively flat fertility trend will result in a slow growth of youth population under the age of 20 years. One important social-economic implication of having a declining proportion of workers in the population is the change in dependency ratios in the province. Other things being equal, there will be more youths and seniors depending on the productivity of the working population in the future (BC Stats 2020).

Proportionally, there will be consistently more women than men living in BC throughout the whole projection period. Population gender ratio, expressed as the number of men per 100 women in the population, is 98.0 in year 2020 and is projected to decline slowly and steadily to 96.5 in year 2041 (BC Stats 2020).

BC Stats also provides a web-based population projections application that provides projections generated based on selected regions and region types. Population projections are not available at a community level.

Population projections produced by BC Stats utilize various inputs, including the Major Projects Inventory (MPI) in arriving at their regional population forecasts. The MPI provides a tangible selection of large-scale infrastructure developments (each over 15 million dollar (\$) in capital costs) at varying stages of completion. Also, major local facility development or closures, such as a mine closure, may have significant impacts on small areas in terms of movement of people. Migration assumptions are revisited annually to verify and possibly adjust previous considerations, due to the unpredictable nature of certain local economic activities (BC Stats 2020). **Table 4.2.8** provides population projections for the RDBN. Population projections for the community of Witset are provided in **Table 4.2-6**.

Table 4.2-8: Regional District of Bulkley-Nechako (RDBN) Population Projections

Year	Total Population	% Change from Previous Interval
2006	38,200	-7.0
2011	39,800	4.1
2016	39,600	0.1
2021	38,300	-3.2
2026	41,500	8.3
2031	44,800	8.0
2036	48,100	8.9
2041	51,100	6.2

Source: BC Stats 2020

Note: %=percent

5. ASSESSMENT OF PROJECT-RELATED EFFECTS

The information provided within this subsection includes:

- ▶ identification of potential Project-related interactions with the Demographics VC;
- ▶ description of potential Project effects on the Demographics VC;
- ▶ mitigations measures; and
- ▶ characterisation of Project residual effects and determination of their significance on the Demographics VC.

5.1 Potential Project-related Interactions with the Demographics Valued Component (VC)

Whereas interactions with the Project may be positive or negative, this subsection will focus on those interactions with potential to adversely affect local and regional demographics. Interactions between Demographics and the Project are expected to include induced economic activity and employment in the RSA and LSA and are phase-wide.

To avoid double-counting within each identified Project activity listed below, interactions between the Demographics VC and the Project have been defined in **Table 5.1-1** and summarized in **Table 5.1-2**, including population changes as a result of Project employment, labour and related spending. The employment and labour activity in **Table 5.1-2** is intended to explicitly include all Project-related changes in population and related demographic factors.

Table 5.1-1: Potential for an Interaction between the Demographics Valued Component (VC) and the Tenas Project

Term	Definition
No Interaction	Tenas Project (Project) activity will not interact with the Demographics Valued Component (VC), no adverse effect is expected; no further consideration is warranted.
Interaction	Interaction between the Project activity and the Demographics VC may have a substantive influence on the short- or long-term integrity of the VC (i.e., measurable or detectable using the identified indicator). The potential effect(s) of the interaction is considered further in the effects assessment.

Interactions expected to result in potential adverse effects on demographics are discussed in **5.2 Potential Project-related Effects**. Where no interaction between the Project and a subcomponent is anticipated or the interaction is considered minor (i.e., not expected to have a substantive influence on the short- or long-term integrity of the subcomponent as the effect would not be measurable or detectable using the identified Indicator) the interaction is not considered further in the assessment.

Table 5.1-2: Interactions Between Demographics Valued Component (VC) and the Tenas Project

Project Activities	Demographics Valued Component
Construction	
Transportation of equipment, materials, and personnel	
Site clearing (surveying, clearing, grubbing, soil salvaging)	
Construction of Surface Water Management Infrastructure, including channels and ponds (sedimentation, control, management, storage)	
Construction of Bypass Road and quarries from the Minesite to the Rail Infrastructure	
Improvements to existing private road and Forest Service Roads	
Construction of haul roads and service roads within the Minesite	
Construction of the permanent Goathorn Bridge Crossing over Goathorn Creek	
Construction of the Coal Processing Plant	
Construction of fuel and lubricant storage facilities and distribution network	
Construction of administration buildings (first aid, maintenance, mine dry, warehouse, laboratory, parking, and vehicle wash facilities)	
Construction of a 25 kilovolt (kV) powerline and a 600 volt (V) substation adjacent to the Coal Processing Plant	
Construction of Rail Infrastructure including Rail Loop and Loadout connecting to the existing main Canadian National Railway line	
Installation of water supply wells, storage, and distribution system	
Construction of the water discharge infrastructure	
Construction of storage piles for overburden, rock separated from coal in Coal Processing Plant, and stockpiles for topsoil and vegetation management	
Construction of material handling systems for Minesite, including run-of-mine coal, processed coal, process rock conveyors, and stockpiles	
Construction of solid waste management systems including recycling and composting facilities	
Construction of Explosives Magazine (storage building)	
Employment and labour	X

Project Activities	Demographics Valued Component
Operation	
Mining the open pit (soil salvaging, drilling and blasting, excavation of material, dewatering, loading, hauling, unloading)	
Operation of Surface Water Management Infrastructure including channels and ponds (sedimentation, control, management, storage)	
Maintain and use Bypass Road and quarries from the Minesite to the Rail Infrastructure	
Maintain improved private and Forest Service Roads	
Maintain haul roads within the Minesite, including service roads	
Maintain permanent bridge over Goathorn Creek	
Operate Coal Processing Plant	
Maintain fuel and lubricant storage facilities	
Maintain administration buildings (first aid, maintenance, mine dry, warehouse, laboratory, and vehicle wash facilities)	
Maintain 25 kilovolt (kV) powerline and a 600 volt (V) substation adjacent to the Coal Processing Plant	
Transportation of equipment, materials, and personnel	
Maintain and use Rail Infrastructure including Rail Loop and Loadout connecting to the existing main Canadian National Railway line	
Operate water supply wells, storage, and distribution system	
Operate the water discharge infrastructure	
Maintain storage piles for overburden, rock separated from coal in Coal Processing Plant, and stockpiles for topsoil and vegetation management	
Operate material handling systems for Minesite, including run-of-mine coal, processed coal, process rock conveyors, and stockpiles	
Operate solid waste management systems including recycling and composting facilities	
Maintain Explosives Magazine (storage building)	
Progressive reclamation	
Employment and labour	X
Decommissioning and Reclamation	
Dismantle and remove mining equipment and facilities (including powerline, Rail Infrastructure)	

Project Activities	Demographics Valued Component
Transportation of equipment, materials, and personnel	
Reclamation and closure activities at Minesite	
Reclamation and closure of Bypass Road and haul roads, including quarries	
Reclamation and closure of permanent bridge over Goathorn Creek	
Reclamation and closure of powerlines	
Reclamation and closure of Rail Infrastructure	
Implement post-mining systems and monitoring	
Employment and labour	X
Post-closure	
Maintain post-mining systems and ongoing monitoring	
Transportation of equipment, materials, and personnel	
Employment and labour	X

Notes:

Interaction (X): Interaction between the Project activity and the VC may have a substantive influence on the short- or long-term integrity of the VC (i.e., measurable or detectable using the identified indicator). The potential effect(s) of the interaction is considered further in the effects assessment.

No interaction (blank cell): Project activity will not interact with the VC; no adverse effect is expected; no further consideration is warranted.

5.2 Potential Project-related Effects

This subsection considers potential Project-related effects on Demographics arising from potential interactions identified in **Table 5.1-2** and in relation to the indicator for Demographics in **Table 3.2-2**. Mitigation measures are described in **5.3 Mitigation Measures**. Based on the nature of the interactions identified in **Table 5.1-2**, the following adverse effect has the potential to occur:

- ▶ a change in population and related demographic factors affecting use of infrastructure and services, land and resource use or community well-being to an extent that affected communities and associated services are unable to absorb the change.

5.2.1 Assumptions and Conservative Approach

The Project plans to hire a substantial portion of the Construction, and Operation phase workforce from existing residents of LSA communities. Therefore, if the Project's employment objectives are fully realized, Project activities and spending would result in only a small change in population or community composition. However, given it is difficult to adequately forecast the success of the Project's hiring strategy or the potential availability of some specialized construction skillsets and workers within the LSA, in order to test the Project's local hire assumptions and provide a conservative estimate of demographic change, the assessment has considered three (3) local-sourcing scenarios for comparison for each Construction and Operation phases:

- ▶ Construction Phase:
 - ▶ 30% of the Construction Phase workforce is locally sourced from the resident LSA population (LSA, RDBN A, and RDBN G);
 - ▶ 60% of the Construction Phase workforce is locally sourced;
 - ▶ 90% of the Construction Phase workforce is locally sourced;
- ▶ Operation Phase:
 - ▶ 60% of the Operation Phase workforce comes from the existing resident LSA population (including RDBN A and RDBN G);
 - ▶ 75% of the Operation Phase workforce comes from the resident population; and
 - ▶ 90% of the Operation Phase workforce comes from the resident population.

The size of the Project workforce are based on estimates and modeling outputs described in **S5.0-C1 Labour Market VC**. Assessment of a range of proportions of locally sourced workforce, as well as indirect and induced additions to population, are intended to provide a conservative estimate and a potential overestimation of potential effects on Demographics.

An in-migrant population, particularly during the Project's Operation Phase, could affect the population and demographic composition of LSA communities if this change in population substantially exceeds population projections. The following subsections provide an assessment of anticipated effects by Project Phase.

Assumptions and the conservative approach applied to the Construction, and Operation phases of the Project have not been extended to Decommissioning and Reclamation, and Post-closure phases due to the expected incremental loss of local resident jobs and that the Project workforce during these phases will be taken up by a portion of the then existing locally-resident Operation Phase workforce, while the remainder of the Operation Phase workforce will seek employment elsewhere or out-migrate from the LSA communities.

5.2.2 Change in Population and Related Demographics Factors

5.2.2.1 Construction Phase

Construction is anticipated to incrementally ramp up following the start of the Construction Phase, peaking in the summer of its second year over a four (4)-month period. As described in **S5.0-C1 Labour Market**, direct Project employment at peak construction is estimated to include 118.3 full-time equivalents (FTEs) of contractor³ employment and 9.6 FTE of TCL employees, filling up to 186 jobs at peak workforce in the second year of construction⁴. An additional 9.0 FTEs related to the Heavy Equipment and Maintenance Shop were also considered in relation to the Construction Phase. However, as noted in **S5.0-C1 Labour Market VC**, because of a modular Minesite design many fabrication activities will occur offsite and outside of the RSA, with complete modules and equipment already assembled and brought to the Minesite. Typically, the onsite construction workforce will be small (approximately 70 people or less), varying depending on construction requirements (see **S5.0-C1-5.2.1.1 British Columbia (BC) Input-Output Model (IOM) Assumptions and Caveats**).

During the Construction Phase, indirect and induced employment due to Project-related spending and increased economic activity in the RSA is estimated to be 43.3 full-time equivalents (FTEs) or 52.9 jobs. **S5.0-C2 Economic Development VC** provides discussion of potential economic development-related effects of the Project and **S5.0-C1 Labour Market VC**, a discussion of employment-related effects.

TCL estimates that at least 60% of the Construction Phase workforce will be locally sourced (**S5.0-C1 Labour Market VC**). Based on the mix of skillsets and a more conservative estimate that 30% workforce will be locally sourced:

- ▶ Forty-one (41) of the total 137 FTEs would be taken up by 41 to 60 existing residents of LSA communities and surrounding area in Electoral Areas RDBN A and RDBN G;
- ▶ 70% of the remaining 96 FTEs would be filled by approximately 110 contract workers that will temporarily in-migrate to the LSA from the RSA, or elsewhere, for varying durations of time during the 1.5 year Construction Phase. The Project plans to contract a block of up to 70 short-term accommodation rooms available in the LSA communities of Smithers and Houston during the 1.5 year Construction Phase, thereby eliminating the need for a Project work camp or Fly-In-Fly-Out (FIFO) arrangements. Ground transportation to the construction site would be arranged by TCL;
- ▶ As a result of Project spending during the Construction Phase, approximately 43 FTEs will be created through spin-off (indirect and induced) employment. Assuming that a portion of this short-term increase in indirect or induced jobs will likely be generated outside of the RSA due to the Project's modular design, or that the skillsets for these jobs, typically in the retail, transportation and services sectors already exist in the RSA, it is assumed most of the people filling these positions will be resident in the RSA/LSA prior to the construction period; and
- ▶ In total, under the conservative 30% local-sourcing scenario, during the Construction Phase, up to 110 construction workers would be temporarily accommodated in short-term accommodations for varying durations of time. Spin-off employment within the RSA/LSA is expected to be primarily filled by local residents. **S6.0-C5 Community Well-being** provides discussion of potential community health and well-being effects of the Project. **S6.0-C3 Infrastructure and Services** provides discussion of potential short-term accommodations, infrastructure, and services-related effects of the Project.

³ Contractor is a person or company that works on a contractual basis.

⁴ This refers to the peak workforce activity, not the various jobs that would be created as a result of Project Construction Phase.

Based on a 90% locally sourced Construction Phase workforce:

- ▶ 123 of the total 137 FTEs would be held by 123 to 140 residents of the LSA communities;
- ▶ 10% of the remaining 14 FTEs, would be filled by less than 30 contract workers that will temporarily in-migrate to the LSA and be provided short-term accommodations in Smithers or Houston;
- ▶ As a result of Project spending during the Construction Phase, approximately 43 FTEs will be created through indirect and induced employment. Given that the general skillsets for these spin-off jobs, typically in the retail, transportation and services sectors already exist in the RSA, it is assumed most of the people filling these positions will be resident in the RSA/LSA prior to the construction period; and
- ▶ In total, under the 90% local sourcing scenario, during the Construction Phase less than 30 temporary shift workers would be accommodated in short-term accommodations. Indirect and induced employment will be taken up by available residents in the RSA/LSA.

In addition to the short-term temporary workforce, a smaller proportion of workers not already resident in the LSA or RSA are expected to begin to migrate into the LSA during the Construction Phase (i.e., those workers with specialized skillsets involved in preparing for the next Project phase and will continue to work the into the Operation Phase). **Table 5.2-1** summarizes the estimated Construction Phase workforce for the conservative (30% locally sourced) scenario and the 90% locally sourced scenario.

Table 5.2-1: Construction Phase Workforce Scenarios

	Conservative Estimate (30% Locally Sourced Workers)	TCL Modelled Estimate (60% Locally Sourced Workers)	High Estimate (90% Locally Sourced Workers)
Peak Workforce	137 FTE (approximately 186 workers/jobs)		
Hired from LSA	56	112	167
Temporarily in-migrating to LSA	130	74	19

Notes: %=percent; FTE=full-time equivalent; LSA=Local Study Area

The anticipated in-migration of workers during the Construction Phase of the Project will be temporary and short-term. The Project expects to hire up to 60% of the construction workforce locally, which will not affect the local population structure. Workers coming from outside the LSA will be housed in short-term accommodations in Smithers and Houston. Even allowing for a more conservative 30% local hire rate, the part-time and temporary workforce will be staggered over the peak construction period and accommodated in short-term accommodations in Smithers and Houston. The incremental ramp-up to the peak longer-term Operation Phase workforce during the Construction Phase will also limit in-migration into the RSA/LSA area.

5.2.2.2 Operation Phase

The Project estimates that direct employment will peak at 166 FTEs (including TCL employees and contractors) in the fourth year of the Operation Phase, after a three (3)-year ramp-up. During the Operation Phase at peak, indirect and induced employment due to Project-related spending and increased economic activity in the RSA is estimated to generate an additional 30 FTEs (**S5.0-C1 Table 5.2-3**) of indirect or induced employment. Similar to the Construction Phase, it is expected that a substantial portion of the workforce will be employed locally. However, due to the longer-term and specialized nature of some

employment opportunities in this phase, it is expected that some workers may choose to re-locate to the LSA more permanently. **S5.0-C1 Labour Market VC** provides further discussion of potential employment-related effects of the Project.

The Project estimates that, during the peak of the Operation Phase, at least 75% of the workforce (approximately 130 workers) will be drawn from the existing labour force resident in the LSA, and 25% of the peak workforce (approximately 40 workers) will in-migrate to the LSA. Of the workers expected to in-migrate to the LSA, 80% are estimated to in-migrate with families. Using the average family size for families in the RSA (2.9), the Operation Phase workforce will account for approximately 116 new residents in the LSA, living in 40 additional households.

Based on a conservative estimate of 60% locally sourced workers during peak of Operation Phase:

- ▶ Approximately 102 workers will be sourced locally from LSA communities and surrounding area in Electoral Areas RDBN A and RDBN G;
- ▶ An estimated 68 workers will in-migrate to the LSA, approximately 80% with families at a rate similar to population movements in previous census data. The average family size is also expected be similar to the size of families in the RSA (2.9 residents per household). Family members, therefore, will account for an additional 129 people, for a total of an additional 197 residents to the LSA;
- ▶ Project spending is also expected to create at peak 30 spin-off (indirect and induced) jobs. It is assumed that the skillsets for these additional jobs will exist within the RSA and will likely be taken up by the resident RSA population. The additional employment, primarily in the retail, transportation, and services sectors, along with the wages typically offered in those sectors, are unlikely to be sufficient inducement to migration into the RSA/LSA when an existing labour pool in the LSA already exists; and
- ▶ In total, the Project is expected to account for an additional 197 residents in the LSA.

Based on the estimate of 90% locally-sourced Operation Phase workforce:

- ▶ Approximately 153 workers will be sourced from LSA communities;
- ▶ Approximately 17 workers will in-migrate to the LSA. Including family members, peak Operation Phase can be expected account for an additional 49 people; and
- ▶ The additional 30 jobs generated at peak through spin-off employment will likely be taken up by current residents of the LSA and RSA.

Recognizing that the conversion from projected FTEs to the actual number workers in the workforce is a conservative estimation based on professional judgment and experience, **Table 5.2-2** summarizes the estimated Operation Phase workforce for the three scenarios.

Table 5.2-2: Operation Phase Workforce Scenarios

	Conservative estimate (60% locally sourced workers)	TCL modelled estimate (75% locally sourced workers)	High estimate (90% locally sourced workers)
Peak Workforce	166 FTE (approximately 170 workers/jobs)		
Hired from LSA	102	130	153
In-migrating to LSA	68	40	17

	Conservative estimate (60% locally sourced workers)	TCL modelled estimate (75% locally sourced workers)	High estimate (90% locally sourced workers)
Total In-migrants to LSA (including families)	197	116	49

Notes: %=percent; FTE=full-time equivalent; LSA=Local Study Area; RSA=Regional Study Area

During the Operation Phase, the Project anticipates drawing at least 75% of its workforce from existing residents from the LSA (i.e., within a one (1)-hour drive from the Project site). Using a more conservative estimate of 60%, in-migration of population may contribute to an offsetting of a recent projected contraction in the regional population. Nevertheless, in-migration of population related to Project activities and spending has the potential to increase:

- ▶ economic activity in the LSA and RSA;
- ▶ demand for housing and rental accommodations in the LSA and RSA;
- ▶ use of community services and infrastructure in the LSA and RSA;
- ▶ recreational use in the LSA and RSA; and,
- ▶ traffic in the LSA.

For more information on economic activity in the LSA/RSA, refer to **S5.0-C1 Economic Development VC**. Housing, infrastructure and community services and traffic are discussed in more detail in **S6.0-C3 Infrastructure and Services VC**. For recreational use, refer to **S6.0-C4 Land and Resource Use VC**.

5.2.2.3 Decommissioning and Reclamation Phase

Activities associated with the Decommissioning and Reclamation Phase will provide some short-term employment for approximately 45 workers or 38.8 FTEs over a four (4)-year period. However, the net overall effect during this phase of the Project will be the loss of 85.2 Operation jobs in the previous year and an additional loss of 11 spin-off (indirect and induced) jobs because of the reduction in Project activities and spending.

As discussed in **4.2.4 British Columbia (BC) Population Projections**, population projections forecast a 1.4% annual increase in population for the Nechako Development Region (**Table 4.2-7**), and projections for the RDBN result in an estimated population of 52,000 by 2041 (**Table 4.2-8**). This increase is relative to the 38,300 population projection for the RDBN in 2021. Witsset projected population is in the range of 2,550 to 3,188 by 2038 (**Table 4.2-6**). The potential loss of population, if any, associated with a potential Project-related effect is small relative to the projected population changes for this phase.

5.2.2.4 Post-closure Phase

In the Post-closure Phase, most workers previously employed in the Operation, or Decommissioning and Reclamation phases of the Project are expected to seek other employment opportunities in the LSA or out-migrate to other RSA communities or out of the region. There will also be a relatively small number of jobs associated with Post-closure Phase activities (**S5.0-C1 Labour Market VC Table 5.2-6**).

5.3 Mitigation Measures

This subsection describes the mitigation measures to address the potential effects of the Project on Demographics. The mitigation measures are consistent with the mitigation definition provided by the BC EAO (2013) which describe mitigation measures as any practical means or measures taken to avoid, minimize, rehabilitate onsite, and if required, compensate, or offset, the potential adverse effects of a project. Mitigation measures include applicable standards and guidelines, and best management practices (BMPs) supported by specific guidance documents.

TCL has incorporated several mitigation measures in the Project's design and/or standard operational procedures to reduce the magnitude, duration, and extent of effects due to the Project. These Project mitigation measures are outlined in **S1.0 Overview of Project Proponent Description of the EAC Application**. Project mitigation measures are relevant to minimizing potential Project-related effects on the Demographics VC are provided in **5.3.1 to 5.3.3**. However, since not all effects can be addressed through design, additional mitigation measures are planned for the Construction, and Operation Phases (**5.3.4 to 5.3.9**). Mitigation measures to manage a change in population and related demographic factors are considered unnecessary during the Decommissioning and Reclamation, and Post-closure phases because of projected population increases in RSA over the next 25 years, a planned incremental decrease in the workforce as the Project reaches the end of its operational life, together with an expectation that workers will choose to find other work in the LSA or RSA. These mitigations support and are also included in **S5.0-C1 Labour Market VC**. All mitigation measures for Demographics are summarized in **Table 5.3-1**.

Several environmental management plans will define the standard operating procedures, the best management practices (BMPs), the adherence to existing regulations, and the use of appropriate design criteria. Environmental Management Plans will define the purpose and objectives, scope, the best management practices, the adherence to existing regulations, and mine employee roles and responsibilities. Project operations are governed by an overarching Environmental Management System (EMS), provided in **S13.0-C1**, of which all management plans are a part. Measures to mitigate potential adverse effects on the Demographics VC will be incorporated into the into various Project management plans such as the: **Socio-economic Management Plan (S13.0-C16) (SEMP)**. Management plans provide direction on sequencing, monitoring and adaptive management to ensure that measures are timely and effective.

The mitigation measures (described below) are based on proven and accepted mitigation used in BC. The Mitigation measures are expected to be effective immediately following implementation during the Construction Phase and thereafter.

5.3.1 People, Employees, Contractors, and Onsite Policies

The following mitigation measures apply to people, employees, contractors, and onsite policies:

- ▶ Establish and implement an onsite policy prohibiting alcohol consumption, smoking, vaping, and drug use;
- ▶ Establish and implement an onsite policy prohibiting shooting, hunting, and fishing within the Project Area;
- ▶ Establish an Indigenous Cultural Awareness Induction program for employees, visitors, and contractors in collaboration with the Wet'suwet'en; and
- ▶ Establish and implement policies to promote no workplace harassment of any kind; environmental protection and awareness; whistle blower protection; health, safety, and security; and multi-cultural and multi-generational workforce considerations.

5.3.2 Enhance Local and Regional Benefits including Employment

The following mitigation measures are intended to enhance local and regional benefits

- ▶ Enhance local and regional benefits by identifying opportunities to promote direct employment from and procurement of Project goods and services acquired from the Socio-economic RSA;
- ▶ Provide incentives and inducements to workers to move permanently to a location within the Socio-economic RSA and require the Project management team to reside within the Socio-economic RSA to benefit the local and regional economy;
- ▶ Work with Indigenous groups to develop a strategy to identify and reduce barriers to employment and training and report progress annually to designated Indigenous groups;
- ▶ Establish and implement plans that include training opportunities (see SEMP) such as:
 - ▶ Work with training institutions such as local colleges and education providers to provide training programs and skills upgrading;
 - ▶ Partner with local contractors to provide TCL apprenticeship programs;
 - ▶ Identify and train under-represented groups;
 - ▶ Offer scholarships and bursaries to encourage high school graduation and encourage groups to participate in science, technology, engineering, and mathematics (STEM) programs at a college, and/or university level;
 - ▶ Offer scholarships and bursaries to encourage people to participate in recognized trade programs;
 - ▶ Offer scholarships, bursaries, and employment opportunities for dependents of TCL employees in post-secondary education institutions;
- ▶ Offer employment opportunities for students in local post-secondary education institutions;
- ▶ Support apprenticeship programs both onsite and offsite with other industry partners; and
- ▶ Report progress in implementing these plans annually to designated Indigenous and stakeholder groups.

5.3.3 Housing Measures

TCL is aware of the current housing shortage and lack of housing stock and diversity within the Socio-economic RSA determined for the Project. The following measures are intended to promote local housing opportunities:

- ▶ Provide incentives and inducements to employees to move permanently to a location within the Socio-economic RSA and require the Project management team to reside in the Socio-economic RSA to benefit the local and regional economy (refer to the **SEMP**); and
- ▶ Provide incentives and inducements to developers and partner with government to encourage the development of additional housing stock/supply and diversity of housing in the Socio-economic RSA.

5.3.4 Education and Training Support

TCL will work to increase the skill capacity of the local and regional labour force and to reduce barriers to employment for Indigenous workers. Mitigation measures will focus on training efforts to prepare the unemployed and underutilized labour force for employment at the Project, as well as to increase the availability of skilled workers in the region for employment at other local and regional businesses. The

following measures will be addressed through the Education, Training, and Employment Program (refer to **SEMP**) and will include:

- ▶ provide training, targeting entry-level positions and on-the-job training where previous experience is not necessary;
- ▶ develop and implement of a professional training plan to support training needs for the Project that can include specialized skilled training, such as apprenticeship programs for trades positions;
- ▶ support efforts on the part of employees to upgrade their education as a means towards job advancement;
- ▶ cooperate with local educational authorities, institutions, and the industry in general, to develop and implement high school and college training with mining sector content;
- ▶ support the training of Indigenous people and cooperate with programs such as Indigenous Skills and Employment Training Program (ISET) to improve access to funding for Indigenous individuals and support skill building of the Indigenous workforce in the RSA; and
- ▶ cooperate with financial institutions to support financial resource needs required for training (e.g., a clear indication of workforce needs and intention to employ workers at the Project), given specific education can increase the likelihood of receiving a student loan.

5.3.5 Housing and Accommodation Program

To assist employees of TCL to own permanent housing in the region around the proposed Project, the following mitigation measures will be addressed through the Housing and Accommodation Program (refer to **SEMP**) and will include:

- ▶ TCL will fund the accommodation of non-local experienced personnel that the company requires during the Construction Phase:
 - ▶ A Request for Proposal (RFP) will be provided to accommodation providers at least six (6) months prior to use by the Project construction workforce, and the RFP will be for a set number rooms for a guaranteed duration of time;
 - ▶ Reservations will be made at various campgrounds and RV parks to allow the Project construction workforce to use some of these facilities;
 - ▶ Discussions with groups in Telkwa, Smithers and Houston for the temporary rental of rooms for construction workforce will be secured at least six (6) months prior to use;
 - ▶ TCL will endeavour to use local companies to complete most of the construction activities for the Project to reduce the requirements for temporary accommodation;
- ▶ To accommodate the permanent workforce for the Operation Phase:
 - ▶ Grants to be used for the purchase or upgrade of permanent local housing will be provided to employees who reach designated milestones with the company;
 - ▶ TCL will work with local developers to provide guaranteed rental rates and duration to incentivize the construction of accommodation for permanent employees and communities at large; and
 - ▶ TCL will provide transportation from both Houston and Witset if at least six (6) employees reside in these locations to promote alternatives for employees to reside and still be within a reasonable driving distance (less than 90 minutes) from the Project.

5.3.6 Communication Measures

To allow potential employees within the LSA (including RDBN A and RDBN G) to take advantage of Project-related employment opportunities, TCL will implement the following communication measures (refer to Education, Training, and Employment Program in the **SEMP**):

- ▶ establish temporary Project recruitment offices in Telkwa, Smithers, Houston, and Witset prior to commencement of the Construction Phase;
- ▶ communicate Project schedules and the type and number of jobs to be required by phase, including required skills, education, responsibilities, and compensation;
- ▶ advertise employment opportunities for potential employees within the RDBN and contractors well in advance to provide job seekers with improved opportunity to obtain skills to qualify for employment and contracts at the Project;
- ▶ set and communicate local employment objectives to maximize local employment and income benefits, including employment for Indigenous workers and other vulnerable groups; and
- ▶ host Employment Information Sessions in LSA/RSA communities during the Construction Phase of the Project, to provide information about the opportunities associated with Project employment.

5.3.7 Health, Safety, and Human Resources Superintendent

To maximize local resident Indigenous employment and reduce the effect of barriers to Indigenous employment and participation, the Project will make reasonable efforts to hire Indigenous workers and work towards reducing the barriers to employment for Indigenous people (refer to the **SEMP**).

- ▶ TCL will set clear and ambitious objectives regarding Indigenous employment at the Project and create a Health, Safety, and Human Resources Superintendent role at the Project to support employment opportunities for Indigenous people; and
- ▶ The Health, Safety, and Human Resources Superintendent will:
 - ▶ engage with prospective applicants and provide information about employment opportunities, qualifications, and the nature of working at the Project, as well as liaise with the Indigenous workers at the Project to help address challenges at the workplace as they arise;
 - ▶ support the workers at the Project in health and well-being;
 - ▶ develop and support an Employee and Family Assistance Program to be available to employees and their families;
 - ▶ address specific health and well-being needs of the workers at the Project, as they arise;
 - ▶ develop (and review annually) health and well-being policies and procedures to suit the needs of the Project and the workers; and
 - ▶ provide workers with information and access to the resources this program provides and encourage their use.

5.3.8 Indigenous Cultural Awareness Induction

Indigenous Cultural Awareness Induction is a practise that is becoming more common for mining projects in Canada with the objective to improve the hiring and retention of workers from vulnerable groups or minorities. Indigenous Cultural Awareness Induction can improve cultural awareness by helping employees to respond to their own unconscious or hidden bias, act in a culturally appropriate manner defined company-

wide and improve communication and decision-making. This induction process is expected to improve the hiring and retention of Indigenous workers, and workers from other minorities or vulnerable groups.

To recruit and retain a local resident workforce, TCL will:

- ▶ work with the OW to develop and implement an Indigenous Cultural Awareness Induction Program to educate employees and contractors on how to work effectively with colleagues from different backgrounds, to strengthen relationships, and improve retention of Indigenous workers, and workers from other minorities or vulnerable groups; and
- ▶ design cultural awareness induction before the Construction Phase of the Project and provide it to Project employees, and contractors, during the four (4) phases of the Project, continuously working to improve cultural awareness and acceptance. The Indigenous Cultural Awareness Induction Program is part of the Education, Training, and Employment Program presented in the **SEMP**.

5.3.9 Child Care Program

- ▶ TCL will share information about its projected workforce needs with child care service providers in the LSA in accordance with the **SEMP** so that they can anticipate and plan for the increased demand for services.
- ▶ TCL will fund at least one (1) full-time position at a government approved child care facility in the RDBN that will be selected by TCL via an application process, with the provision that additional matching full-time positions are funded by government sources, and that preference is given to children of TCL employees for additional capacity created; and
- ▶ TCL will also fund at least one (1) full-time position with Indigenous groups at an approved child care facility operated by an Indigenous group in the region that will be selected by TCL via an application process, with the provision that an additional matching full-time position is funded from Indigenous and/or government sources, and that preference is given to children of TCL Indigenous employees first, and then TCL non-indigenous employees for additional capacity created. The Child Care Program is part of the Education, Training, and Employment Program presented in the **SEMP**.

5.3.10 Summary of Mitigation Measures

A summary of the mitigation measures to avoid or reduce potential Project-related adverse effects on Demographics, and whether or not a residual effect is anticipated, is provided in **Table 5.3-1**.

Table 5.3-1: Summary of Potential Effects and Mitigation Measures for Demographics Valued Component (VC)

Potential Effect	Contributing Activities Within the Project Phase (C, O, D, P)	Proposed Mitigation Measures	Residual Effect (Yes/No)
Change in population and related demographic factors	Employment and Labour (C)	- People, employees, contractors and on-site policies - Enhance local and regional benefits including employment measures - Housing measures - Education and training support (See Socio-economic Management Plan [S13.0-C16] [SEMP]) - Housing and Accommodation Program (see SEMP) - Communication measures (see SEMP) - Health, Safety, and Human Resources Superintendent (see SEMP). - Indigenous Cultural Awareness Induction (see SEMP). - Child care program (see SEMP)	No
Change in population and related demographic factors	Employment and Labour (O)	- People, employees, contractors and on-site policies - Enhance local and regional benefits including employment measures - Housing measures - Education and training support (see SEMP) - Housing and Accommodation Program (see SEMP) - Communication measures (see SEMP) - Health, Safety, and Human Resources Superintendent (see SEMP). - Indigenous Cultural Awareness Induction (see SEMP). - Child care program (see SEMP)	Yes
Change in population and related demographic factors	Employment and Labour (D)	n/a	No
Change in population and related demographic factors	Employment and Labour (P)	n/a	No

Notes: C, O, D, P represent Project Phases: (C)onstruction, (O)peration, (D)ecommissioning and Reclamation, (P)ost-closure
C=Chapter; n/a=not applicable; Project=Tenas Project; S=Section

See **Table 5.1-2** for list of applicable activities for each listed Project phase, unless otherwise noted in this table.

5.4 Residual Effects and Significance of Residual Effects

This subsection describes anticipated residual effects as they relate to a change in population and related demographic factors. Residual effects are effects that remain after the implementation of all mitigation measures and management strategies and are the expected consequences of the Project for Demographics. The approach to assessing residual Project effects follows the methodology outlined in **S3.0 Assessment Methodology** of the **EAC Application**. The subsection discusses the Likelihood of residual effects, determines the anticipated Significance, and the Level of Confidence associated with the determination of Significance. The assessment is based on consideration of identified residual effect characteristics and socio-economic context for Demographics in informing the assessment of other VCs listed in **3.2.1 Valued Components**.

As discussed in **5.2 Potential Project-related Effects**, the duration of the Construction Phase is short-term in nature. The use of a modular design for Minesite Infrastructure is expected to employ a substantial portion of the workforce outside of the RSA. TCL has estimated at least 60% of the Construction Phase workforce will be locally sourced. With implementation of an Education, Training, and Employment Program (see **SEMP**) aimed at maximizing local employment, it is a reasonable expectation that the conservative estimate of 30% of the Construction Phase workforce will be made up of current residents of the LSA/RSA and the remaining part-time workforce can be housed in short-term accommodations in Telkwa, Smithers and Houston. Existing residents of the RSA/LSA will have no effect on population or related demographics factors. The potential change in population is also not expected to exceed BC Stats population projections during this period. Similarly, potential effects on Demographics during the Decommissioning and Reclamation, and Post-closure phases are not carried forward in the assessment of residual effects.

The following assessment focuses on potential residual effects of a change in population and related demographic factors during the Operation Phase of the Project.

5.4.1 Description of Evaluation Criteria

5.4.1.1 Residual Effects Characteristics

Residual effects on Demographics have been characterised in terms of Magnitude, Geographical Extent, Frequency, Duration, Reversibility, and Context (**Table 5.4-1**).

Table 5.4-1: Effect Characteristics Considered when Determining the Significance of Residual Effects on the Demographics Valued Component (VC)

Residual Effects Characteristic	Definition	Rating
Magnitude	The amount of change is a measurable trend relative to existing conditions.	Low: There is a measurable change in population or the composition of communities that is less than the growth or decline projected by BC Stats. Moderate: The measurable change in population is consistent with growth or decline projected by BC Stats. High: There is a measurable change in population that substantially exceeds growth or decline projected by BC Stats.
Geographic Extent	Spatial scale over which the residual effect is expected to occur.	Local: The effect is limited to a portion of the LSA or all of the LSA.

Residual Effects Characteristic	Definition	Rating
		Regional: The effect is limited to portion of the RSA or all of the RSA. Beyond Regional: The effect is beyond the RSA.
Duration	The length of time over which the residual effect is expected to persist before returning to existing conditions or the effect can no longer be measured.	Short-term: The effect is restricted to the Construction Phase. Long-term: The effect extends through the Operation Phase. Permanent: The effect extends throughout or beyond the Project lifetime.
Frequency	How often the residual effect is expected to occur.	Infrequent: There is a single or irregular occurrence of the effect. Frequent: The effect occurs regularly. Continuous: The effect occurs continuously.
Reversibility	Whether or not the residual effect can be reversed once the activity causing the residual effect ceases	Fully reversible: The effect will cease after Post-closure. Partially reversible: The effect will be reduced after Post-closure Irreversible: The effect will persist indefinitely after the life of the Project.
Context	The extent to which the Demographics VC has been affected by past and present environmental and socio-economic processes and conditions, its potential sensitivity to the Project-related residual effect, and its ability to recover from that effect (i.e., resilience).	Low: The sensitivity of existing population is low relative to the Project workforce and has the resilience and capacity to absorb large increases and decreases in population. Moderate: The existing population is moderately-sized relative to the Project workforce and has the resilience to absorb some increases and decreases in population. High: The sensitivity of the existing population is high relative to the Project workforce and does not have the resilience to absorb even small increases and decreases in population.

Notes: LSA=Local Study Area; Project=Tenas Project; RSA=Regional Study Area; VC=Valued Component

5.4.1.2 Likelihood

Likelihood refers to the probability that the predicted residual effect will occur while considering that the mitigation will be successful. Likelihood is defined as Likely or Unlikely:

- ▶ **Likely:** Moderate-to-High Likelihood of an effect; or
- ▶ **Unlikely:** Low probability of an effect.

5.4.1.3 Significance Determination

There are no defined measures, thresholds, or existing guidance for assessing the significance of change in population or other related demographic factors. The Significance of residual effects of Project-related effects are assessed in comparison to population projections calculated through analysis of information and factors by BC Stats, discussed in 4.2.4. While other characteristics have been considered, based on professional judgment, a significant effect on the Demographics VC by the Project is considered one where the measurable growth or decline in population substantially exceeds population projections and predicted community composition, also considering the resilience of affected local communities to absorb the predicted change:

Significant	The residual effect of the predicted change in population and related demographic factors by the Project is Moderate to High in Magnitude and the sensitivity of affected local communities is High; or
Not Significant	The residual effect of the predicted change in population and related demographic factors by the Project is Low in Magnitude and the sensitivity of affected local communities is Moderate to Low; or

In addition, Level of Confidence in the assessment includes the following ratings: Low, Moderate, and High Confidence, which can also be understood as the level of uncertainty/risk associated with the residual effects assessment (including Significance determination), is a measure of how well residual effects are understood and of the quality of the input data. The reliability of data inputs and analytical methods used to predict Project effects, confidence regarding the effectiveness of mitigation measures and certainty of the predicted outcome are all considered. Confidence estimates allows the decision-maker to evaluate risk associated with the residual effects of the Project. In the determination of confidence, the following is considered:

- ▶ **Low Confidence:** Cause-effect relationships between the Project and Demographics are poorly understood. There may be several unknown external variables and/or data for the Project and therefore, are incomplete. The effectiveness of the mitigation measures may not yet be proven. Modelling results may vary considerably given the data inputs. There is a high degree of uncertainty in the conclusions of the assessment;
- ▶ **Moderate Confidence:** The cause-effect relationships between the Project and Demographics are not fully understood (e.g., there are several unknown external variables or data for the Project and therefore, are incomplete). The effectiveness of mitigation measures may be moderate or high. Modelling predictions are relatively confident. Based on the above, there is a moderate confidence in the assessment conclusions; or
- ▶ **High Confidence:** There is a good understanding of the cause-effect relationship between the Project and the Demographics VC, and all necessary data are available to support the assessment. The effectiveness of the selected mitigation measures is moderate to high. There is a low degree of uncertainty associated with data inputs and/or modelling techniques, and variation from the predicted effect is expected to be low. Given the above, there is High Level of Confidence in the conclusions of the assessment.

Based on these criteria, it was determined that an additional risk analysis was not required.

Characterisation of residual effects is based on the review of publicly available information on existing trends and conditions in 4.2 Description of Existing Conditions and 5. Assessment of Project-related Effects, scientific information, and professional expertise obtained while conducting similar assessments.

5.4.2 Change in Population and Related Demographic Factors

5.4.2.1 Residual Effects Characteristics

Prior to the commencement of the Construction Phase, BC Stats predicts a 3.2% decrease in the regional population (**Table 4.2-8**) in 2021 from the previous interval to 38,300, followed by a substantial increase in population of greater than 8% for each five (5)-year period during the Operation Phase of the Project (for which projections are currently available) to 48,100 in 2036.

The Project plans to hire 75% of the Operations workforce from the local communities. Using a conservative estimate of 60% local Project employment indicates that 68 workers will in-migrate to the RSA/LSA for the Operation Phase, with 80% bringing their families with them if we assume a similar rate for population movements in previous census data. The average family size is also expected to be similar to the size of families in the RSA (2.9 residents per household). Therefore, family members will account for an additional 129 people, for a total of additional 197 residents in the LSA. Project-related indirect and induced employment is estimated to be 30 people, all of which is likely to be taken up by existing residents.

Put in context, population projections estimate an increase of 3,200 people in the RSA population from 2021 to 2026 (8.3%) and a further 3,300 persons added to the RSA population from 2026 to 2031. The in-migration of non-resident workers and their families during the Operation Phase of the Project is expected to increase the LSA population by less than 7% of the projected population increase in the first five (5)-year period. Although the Project-related change is expected to be small relative to the size of the existing population and overall projected population changes, this increase in population may also slightly change the composition of male and females in local communities, the proportion of working-age persons and the number children. For this reason, other related demographic factors are not considered further. Proposed mitigation measures to maximize local resident employment will likely help communities manage this expected small in-migration during the Operation Phase.

Table 5.4-2 provides characterisation of the residual effect and the rationale for each rating according to definitions in **5.4.1 Description of Evaluation Criteria**.

Table 5.4-2: Summary of Effect Characteristics Ratings for a Change in Population and Related Demographic Factors (Operation Phase)

Residual Effects Characteristic	Rating	Rationale for Rating
Magnitude	Low	The Magnitude of this effect is Low. The change in population is measurable (197 or 7% of the projected growth by BC Stats from 2021 to 2026). Changes to the composition of communities, including gender, workforce age and children will be low and expected to be similar to previous in-migrations to the RSA. There is a sufficient pool of skilled, unemployed, or underutilized workers in the local area. The Project will also provide on-the-job training and support local training and educational initiatives.
Geographic Extent	Local	The Project proposes to hire employees within a safe commuting distance, limiting the geographic extent to the LSA communities.
Duration	Long-term	The effect will extend throughout the Operation Phase of the Project but will be reduced or eliminated after the Operation Phase is completed.
Frequency	Continuous	The effect will be continue to a lesser degree throughout the Operation Phase.

Residual Effects Characteristic	Rating	Rationale for Rating
Reversibility	Partially reversible	Adverse increase in population or community composition will be gradually reduced during final years of the Operation Phase.
Context	Low	During the Operation Phase of the Project, the proportion of local residents is expected to increase to near full local employment and any small change in community demographic composition will be absorbed by local communities.

Notes: LSA=Local Study Area; Project=Tenas Project; RSA=Regional Study Area; VC=Valued Component

5.4.2.2 Likelihood

There is a High Likelihood that some small increase in population will occur as a result of Project employment opportunities that are not taken up by an existing resident workforce, so this is rated as Likely. This is mainly because Project efforts to hire from the existing labour pool in local communities is not expected to be completely successful given the range of skillsets required.

5.4.2.3 Significance Determination

S5.0-C1 Labour Market VC indicates the skillsets for the Operation Phase are likely present in the LSA/RSA and employment participation rates are adequate. The Project's employment strategy is designed to maximize local resident employment, eliminating any effect on demographics and population change. Even accounting for a conservatively assessed partial success in the Project's employment strategy, the population change is expected to be Low in Magnitude, with local communities having a Moderate to Low sensitivity to changes in population (**Table 5.4-2**). The amount of Project-related in-migration is also not expected to measurably change the demographic composition of local communities. Therefore, the residual effect on the Demographics VC of a change in population and related demographic factors during the Operation Phase is **Not Significant**.

Population predictions undertaken by BC Stats are reviewed and updated regularly, based on the inputs identified in **4.2.4 British Columbia (BC) Population Projections**. The Level of Confidence is High based on the general reliability of these population predictions and prediction confidence for the residual effect of population change and related demographic factors is high based on the availability of quality existing conditions data, modelling, population projections, as well as the conservative approach taken in assessment of effects. The Project workforce during all phases is small relative to other resource development projects in the region. The Project's success in hiring a resident workforce was underestimated in order to compensate for uncertainties. Actual Project-related residual effects may be of lower magnitude if the Project's employment strategy achieves the higher rate of local employment anticipated.

5.5 Summary of Project-Related Adverse Residual Effects and Significance

The Project-related residual adverse effect on Demographics is summarized in **Table 5.5-1**. As stated in **5.4.1.3 Significance**, to be considered Significant the residual effect of the predicted change in population and related demographic factors by the Project would be Moderate to High in Magnitude and the sensitivity of affected local communities would be High. As assessed, the predicted change in population and related

demographic factors, the Magnitude of effect is rated as Low and does not exceed current population projections, and the communities are expected to be resilient in absorbing these changes during the Operation Phase. As characterised in **Table 5.5-1**, it is concluded that the residual effect of a change in population and related demographic factors is **Not Significant**. However, all residual effects, **Significant** or **Not Significant**, are carried forward into the CEA.

Table 5.5-1: Summary of Residual Adverse Effect for the Demographics Valued Component (VC)

Residual Adverse Effects	Contributing Activities within the Project Phases (C, O, D, P)	Proposed Mitigation Measures	Residual Effects Characterisation								
			Magnitude	Geographic Extent	Duration	Frequency	Reversibility	Context	Likelihood	Significance	Level of Confidence
Change in population and related demographic factors	Labour and employment (O)	- Enhance local and regional benefits including employment - Education and training support (Socio-Economic Management Plan (S13.0-C16) (SEMP))	L	LSA	LT	CF	PR	L	L	NS	H

Notes: C, O, D, P represent Project Phases: (C)onstruction, (O)peration, (D)ecommissioning and Reclamation, (P)ost-closure
C=Chapter; S=Section

Magnitude: Low (L), Moderate (M), High (H)
 Geographic Extent: Local (LSA), Regional (RSA); Beyond Regional (beyond RSA)
 Duration: Short-term (ST), Long-term (LT), Permanent (PT)
 Frequency: Infrequent (IF), Frequent (FF), Continuous (CF)
 Reversibility: Fully reversible (FR), Partially reversible (PR), Irreversible (IR)
 Context: Low (L), Moderate (M), High (H)
 Likelihood: Unlikely (UL), Likely (L)
 Significance: Not Significant (NS), Significant (S)
 Level of Confidence: High (H), Moderate (M), Low (L)

See **Table 5.1-2** for list of applicable activities for each listed Project phase, unless otherwise noted in this table.

6. CUMULATIVE EFFECTS ASSESSMENT (CEA)

This subsection presents an assessment of potential cumulative effects on the Demographics VC. Consideration of cumulative effects is made for all residual adverse effects, whether they are Significant or Not Significant. The following criteria must be met:

- ▶ There must be an effect of the Project;
- ▶ The identified effect is demonstrated to act cumulatively with the effects from other projects or activities;
- ▶ It must be known that the other projects or activities have been or will be carried out and are not hypothetical; and
- ▶ The cumulative effect must be likely to occur. If no cumulative interaction is considered likely, no further analysis is completed.

The Project and Activity Inclusion List is provided in the **S3.0 Assessment Methodology** and identifies past, present and reasonably foreseeable future projects in the LSA and RSA that could have residual effects overlapping with the Project's residual effect on Demographics. The potential cumulative effects, in consideration of Project's residual effects include an adverse change in population and related demographic factors. In order to determine whether the above criteria are met, the residual adverse effects on Demographics identified in **5.4 Residual Effects and Significance of Residual Effects** will be carried forward, and the list of projects and activities will be screened to identify those that are likely to interact with the Project and result in a similar residual adverse effects on Demographics.

The approach to determining cumulative effects on the Demographics VC is as follows:

- ▶ Consider all residual Project effects (See **Table 5.5-1: Summary of Residual Adverse Effect for Demographics**);
- ▶ Assess the types of project/activity and location of project/activity of identified reasonably foreseeable future projects overlaid with the RSA for the Demographics VC (past/present disturbances were accounted for within **4. Existing Conditions**, and subsequently, all past/present effects on the Demographics VC were addressed in **5. Assessment of Project-related Effects**);
- ▶ Use assumptions of spatial and temporal boundaries based on the project/activity category;
- ▶ Determine which projects/activities will have an interaction with the residual effects of the Project;
- ▶ Proceed with the CEA appropriate in resolution to the detail known of the residual effects of reasonably foreseeable future projects/activities;
- ▶ Identify if additional mitigation measures to address cumulative effects (in addition to mitigation measures identified for Project-related effects in **5.3 Mitigation Measures**);
- ▶ Characterise cumulative effects; and
- ▶ Determine Significance as defined in and as carried out for residual Project effects assessment in **5.4 Residual Effects and Significance of Residual Effects**.

6.1 Cumulative Effects Assessment (CEA) for the Demographics Valued Component (VC)

Construction, Decommissioning and Reclamation, and Post-closure phases of the Project were not carried forward to an assessment of residual effects; however, the assessment of cumulative effects will use the same spatial boundary and temporal boundary outlined in **3.2.4 Assessment Boundaries** in order to ensure an assessment of cumulative effects covers a period adequate to consider potential long-term, direct, and indirect effects of the Project that may interact with other projects and activities.

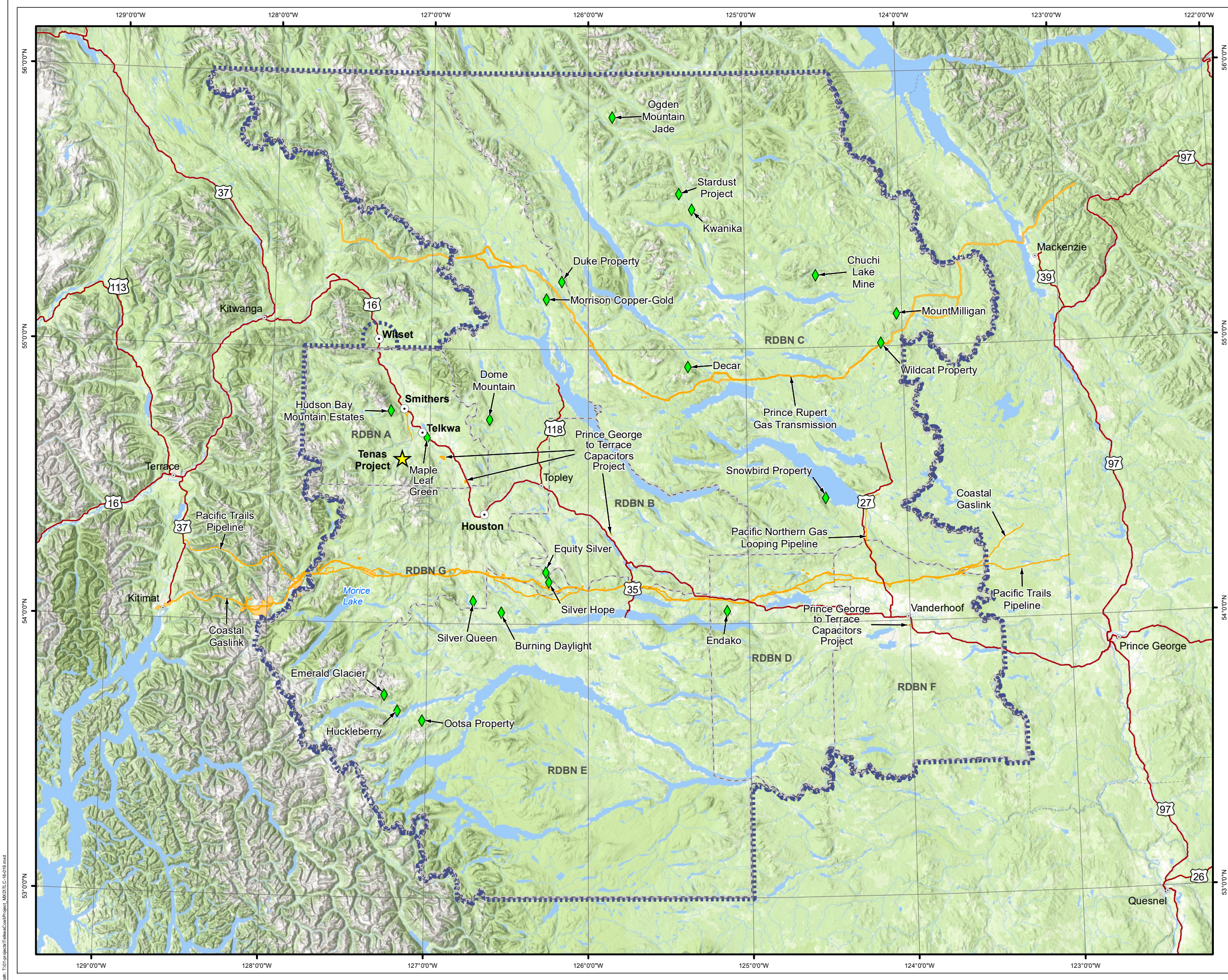
6.1.1 Potential Cumulative Effects

Table 6.1-1 provides a list of Projects included in the cumulative assessment based on their potential to interact with Demographics, and **Figure 6.1-1** depicts their locations within the RSA. The Demographics VC has no subcomponents and one (1) indicator: change in population and other demographic factors. All past and present Project-related effects have been addressed as part of the assessment of existing conditions in **5.4**. Potential cumulative effects of the Project in relation to reasonably foreseeable future projects and activities are considered. There is a likelihood for cumulative effects to occur in the RSA given the overlapping spatial and temporal boundaries of these projects and activities. **Table 6.1-1** lists projects included in the cumulative effects assessment of the Demographics VC based on their potential spatial and temporal interaction with the Project.

Table 6.1-1: Projects Included in the Cumulative Assessment of the Demographics Valued Component (VC) Based on Spatial and Temporal Interaction

Project/Activity Name	Interacts with Project-related Effects on the Valued Component (VC) as a Past, Present or Future Project / Activity	
	Past and Present	Future
Maple Leaf Cannabis Production Facility	Yes	No
Hudson Bay Mountain Estates	Yes	Yes
Smithers, Houston, Telkwa, Witset, Hudson's Bay Estates, and any miscellaneous developments	Yes	Yes
Burning Daylight Quarry	Yes	Yes
Chuchi Lake Mine	Yes	Yes
Decar	Yes	Yes
Dome Mountain	Yes	Yes
Duke Property	Yes	Yes
Emerald Glacier	Yes	No
Endako	Yes	No
Equity Silver	Yes	No
Huckleberry	Yes	Yes
Kwanika	Yes	Yes
Morrison Copper/Gold	Yes	Yes
Mount Milligan	Yes	Yes
Ogden Mountain Jade	Yes	No
Ootsa Property	Yes	Yes
Silver Hope	Yes	Yes

Project/Activity Name	Interacts with Project-related Effects on the Valued Component (VC) as a Past, Present or Future Project / Activity	
	Past and Present	Future
Silver Queen Property	Yes	Yes
Snowbird Property	Yes	Yes
Stardust Project	Yes	Yes
Wildcat Property	Yes	Yes
Telkwa to Smithers Bike Trail	No	Yes
Coastal Gaslink	Yes	Yes
Pacific Northern Gas Looping Pipeline	No	Yes
Pacific Trails Pipeline	No	Yes
Prince George to Terrace Capacitors Project	No	Yes
Prince Rupert Gas Transmission	No	Yes



Tenas Project

Projects and Activities Included in the Cumulative Effects Assessment for Demographics

Legend

- ★ Tenas Project
- Economic Development Local Study Area Community
- ▤ Economic Development Regional Study Area
- ▭ Regional District of Bulkley-Nechako (RDBN)
- ▭ Electoral Areas
- ◆ Project
- ▬ Oil and Gas Feature

Notes

1. All mapped features are approximate and should be used for discussion purposes only.

2. This map is not intended to be a "stand-alone" document, but a visual aid of the information contained within the referenced Report. It is intended to be used in conjunction with the scope of services and limitations described therein.

Sources

- Project Area: Allegiance Coal, 2020
- Basedata: Government of British Columbia
- Basemap: World Topo Base

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The following provides a brief overview of the project and activities identified for inclusion in the cumulative effects assessment for the Demographics VC. Potential change in population is included based on available population projections. Other related demographic factors are not included in this overview since detailed and reliable projections on future community composition are not. The activity of past projects is accounted for in assessment of existing conditions in **5.4 Assessment of Effects**. Projects that have been completed fully or do not have a foreseeable likelihood of future activities have been excluded from the overview of projects below.

- ▶ Burning Daylight Quarry (Mining): Located within the RDBN, the quarry is currently operating. Ongoing future activities may contribute incrementally to population change within the RSA;
- ▶ Chuchi Lake Mine (Mining): This project is located in Electoral Area C of the RDBN, south of Klawdetelle Creek, approximately 6 kilometres (km) north of Chuchi Lake and 90 km north of the community of Fort St. James. Exploration drilling occurred in 2019. Further exploration or development may contribute to population change within the RSA;
- ▶ Coastal Gaslink (Utilities): Traversing Electoral Area G of the RDBN, construction of the pipeline is currently underway. Development and maintenance are likely to contribute to population change within the RSA/LSA;
- ▶ Decar (Mining): Located within the Electoral Area C of the RDBN, rock testing was conducted in 2019. Further exploration or development may contribute to population change within the RSA.
- ▶ Dome Mountain (Mining): The project is located within the Electoral Area G of the RDBN, approximately 38 km east of the Town of Smithers. A past producing mine, additional infrastructure was completed 2010 to 2012. Further development may contribute to population change within the RSA;
- ▶ Duke Property (Exploration): Duke Property is an important porphyry copper-molybdenum-silver-gold deposit located 80 km northeast of Smithers (RDBN), with exploration in 2017 and 2018 and may contribute to population change within the RSA (Amarc Resources 2020);
- ▶ Emerald Glacier (Mining): This project is located inside Electoral Area E of the RDBN, near the border with Electoral Area G and adjacent to the previously operating Huckleberry and Ootsa mines. The last exploration drilling was constructed in 2012. Further development may contribute to population change within the RSA;
- ▶ Endako (Mining): Located near Fraser Lake within the RDBN, the mine has been in care and maintenance (C&M) since 2015. Further future operations may contribute to population change within the RSA;
- ▶ Equity Silver (Mining): A silver, copper, and gold mine, Equity Silver is located in the RDBN, and is currently under C&M, but future operations may contribute to population change within the RSA;
- ▶ Hudson Bay Mountain Estates (Community): Located within Electoral Area A of the RDBN, the resort development includes the addition of a chairlift, 10 runs and a 148 lot residential component to Hudson Bay Mountain. The Area Master Plan has received approval, with 35 lots released in phase 1. Further development and operations is likely to contribute to population change within the RSA/LSA;
- ▶ Huckleberry (Mining): A previously operating mine located inside Electoral Area E of the RDBN, this project is currently in C&M. Exploration drilling occurred in 2020. Further exploration and development may contribute to population change within the RSA/LSA;
- ▶ Kwanika (Mining): Located within Electoral Area C of the RDBN, the last exploration drilling occurred in September 2020, together with an agreement with Takla Nation. Further development and operations is likely to contribute to population change within the RSA;

- ▶ Maple Leaf Cannabis Production Facility (Commercial): Located near the Village of Telkwa, Maple Leaf has leased 37+ acres of land with the option to purchase from Woodmere Nurseries Ltd. The company is currently constructing a 27,200 square feet (ft²) cannabis production facility. Further development and operations is likely to contribute incrementally to population change within the RSA/LSA;
- ▶ Morrison Copper/Gold (Mining): Located within Electoral Area G of the RDBN, the project was refused certification by the BC EAO in 2012. A supplemental AIR was submitted in 2019. Further development and operations may contribute to population change within the RSA/LSA;
- ▶ Mount Milligan (Mining): Located within the RDBN, 155 km northwest of Prince George, and between the communities of Fort St. James and Mackenzie, the mine has been in operation since 2013. Further development may contribute to population change within the RSA;
- ▶ Ogden Mountain Jade (Mining): Located within Electoral Area C of the RDBN, jade has been mined from Ogden Mountain for over 30 years. Further development may contribute incrementally to population change within the RSA;
- ▶ Ootsa Property (Mining): Located adjacent to the Huckleberry Mine and Mill Complex within the RDBN, the last exploration occurred in 2020. Further development may contribute incrementally to population change within the RSA;
- ▶ Pacific Northern Gas Looping Pipeline (Utilities): Traversing Electoral Area G of the RDBN, the proposed pipeline would loop an existing natural gas transmission pipeline between Summit Lake and Kitimat. Further development may contribute incrementally to population change within the RSA;
- ▶ Pacific Trails Pipeline (Utilities): Traversing Electoral Area G of the RDBN, the proposed pipeline would construct a 463-km, 42-inch natural gas pipeline that would deliver natural gas from Summit Lake, BC to the proposed Kitimat liquified natural gas (LNG) facility site at Bish Cove near Kitimat. Further development may contribute incrementally to population change within the RSA;
- ▶ Prince George to Terrace Capacitors Project (Utilities): Located in Electoral Areas A and G of the RDBN, the project includes constructing three new capacitor stations to increase the capacity along a 450-km, 500-kilovolt (kV) powerline that runs between Prince George and northwest BC. The project includes one (1) station near Vanderhoof, one (1) station near Burns Lake, and one (1) near Telkwa. Construction of the project may contribute to population change in the RSA/LSA;
- ▶ Prince Rupert Gas Transmission (Utilities): Traversing Electoral Area G of the RDBN, the proposed 900-km natural gas pipeline running from Hudson's Hope to Lelu Island near Prince Rupert support an LNG export facility. The project was granted a five (5)-year EAC extension in 2019. Construction of the project may contribute to population change in the RSA/LSA;
- ▶ Silver Hope Property (Mining): Located in Electoral Areas G and B of the RDBN, the last exploration drilling occurred in 2020. Further development may contribute to population change within the RSA/LSA;
- ▶ Silver Queen Property (Mining): Located in Electoral Area G of the RDBN, the property is located on the road to the Huckleberry mine at Owen Lake - 43 km south of Houston. Further development may contribute to population change within the RSA/LSA;
- ▶ Snowbird Property (Mining): Located in Electoral Area C of the RDBN, near Fort St. James. Further development may contribute to population change within the RSA;
- ▶ Stardust Project (Mining): Located in Electoral Area C of the RDBN, the last exploration drilling occurred in 2020. Further development may contribute to population change within the RSA;

- ▶ Telkwa to Smithers Bike Trail (Recreation): Located in Electoral Area A of the RDBN, the trail will run off of Highway 16 along the right-of-way (ROW). At Smithers, it is planned to be constructed along the west side of the highway. At about the midway point, it will cross the highway via a bridge and follow the east side of the highway to Telkwa. Detailed construction plans were completed in 2020. Construction of the bike trail may contribute incrementally to population change in the RSA/LSA; and
- ▶ Wildcat Property (Mining): Located in Electoral Area C of the RDBN, the last exploration drilling occurred in 2018. Further development may contribute to population change within the RSA.

The projects and activities summarized above have been included for their potential to interact with the Project's residual effects and contribute to an adverse cumulative increase in population in the RSA/LSA. As mentioned, all past and present activities are accounted for in the assessment of effects in **5.4 Residual Effects and Significance**. For the potential cumulative increase in population from future projects or activities, a reasonable estimate is provided by inclusion of the MPI as a factor used in BC Stats' calculation of population projections.

Future changes in agricultural, forestry and recreational activities that are of a sufficient size to affect Demographics are not known or foreseeable. The extent to which these activities will interact with demographics-related effects of the Project are not known.

6.1.2 Additional Mitigation Measures

No additional mitigation measures beyond those in **5.3 Mitigation Measures** are considered to avoid or minimize the potential adverse cumulative effect of a change in population and related demographic factors that exceeds population projections during the Operation Phase. The Project will refine and optimize its communications, employment and training strategies during the Construction and Operation Phases in order to continue to maximize hiring of a workforce resident in the LSA. Additional information on the Project's employment strategy is available in the **SEMP**.

6.1.3 Cumulative Effects and Characterisation of Significance

The characterisation of cumulative effects in **Table 6.1-2** includes potential adverse effects on Demographics during the Operation Phase of the Project. Based on the TCL's emphasis on recruitment and retention of a local workforce, any addition to cumulative effects are expected to be small and limited to the LSA/RSA. Long-term effects of population are expected to be low, but continuous during the Operation Phase. Changes in related demographic factors such as local community composition will be gradually reduced over the life of the Project and given the low sensitivity and reasonably high resiliency of LSA communities cumulative effects are expected to be **Not Significant**. There is high confidence the Project will contribute to small increase in population during the Operations Phase as a small proportion (25-40%) of the Project's workforce and their families (less than 200 people) in-migrate into the LSA. This small, expected Project-related increase relative to population projections will likely be largely eliminated in the years leading up to the Decommissioning and Reclamation Phase as the Project workforce is reduced and workers seek employment elsewhere in the region or migrate out of the area. The Project's contribution to cumulative effects are not expected to exceed population projections during the Operation Phase.

Table 6.1-2: Summary of Cumulative Effects for the Demographics Valued Component (VC)

Cumulative Effects	Contributing Activities within the Project Phases (C, O, D, P)	Cumulative Effects Characterisation								
		Magnitude	Geographic Extent	Duration	Frequency	Reversibility	Context	Likelihood	Significance	Level of Confidence
Change in population and related demographic factors	Labour and employment (O)	L	RSA	LT	CF	PR	L	L	NS	H

Notes: C, O, D, P represent Project Phases: (C)onstruction, (O)peration, (D)ecommissioning and Reclamation, (P)ost-closure

Magnitude: Low (L), Moderate (M), High (H)
 Geographic Extent: Local (LSA), Regional (RSA), Beyond Regional (beyond RSA)
 Duration: Short-term (ST), Medium-term (MT), Long-term (LT)
 Frequency: Infrequent (IF), Frequent (FF), Continuous (CF)
 Reversibility: Fully reversible (FR), Partially reversible (PR), Irreversible (IR)
 Context: Low (L), Moderate (M), High (H)
 Likelihood: Unlikely (UL), Likely (L)
 Significance: Not Significant (NS), Significant (S)
 Level of Confidence: High (H), Moderate (M), Low (L)

See **Table 5.1-2** for list of applicable activities for each listed Project phase, unless otherwise noted in this table. Includes all existing and reasonably foreseeable projects as outlined in **Table 6.1-1**.

6.2 Summary of Cumulative Effects Assessment (CEA)

A reasonable estimate of the potential adverse cumulative increase in population from the Project's interaction with future projects or activities is provided by inclusion of the MPI as a factor used in BC Stats' calculation of population projections. Since the cumulative effects on Demographics are not expected to exceed the population projections, the Magnitude of effects is Low and Resiliency of communities to small changes in population is expected to be High, the cumulative effect is assessed to be **Not Significant**. **Table 6.2-1** summarizes the potential cumulative effect on Demographics.

Table 6.2-1: Summary of Cumulative Effects on the Demographics Valued Component (VC)

Valued Component	Potential Cumulative Effect	Contributing Activities Within the Project Phases (C, O, D, P)	Cumulative Effect (Yes/No)	Significant (Yes/No)
Demographics	Change in population and related demographic factors	Labour and employment (O)	Yes	No

Notes: C, O, D, P represent Project phases: (C)onstruction, (O)peration, (D)ecommissioning and Reclamation, (P)ost-closure
 See **Table 5.1-2** for list of applicable activities for each listed Project phase, unless otherwise noted in this table. Includes all existing and reasonably foreseeable projects as outlined in **Table 6.1-1**.

7. SUMMARY OF EFFECTS ASSESSMENT FOR THE DEMOGRAPHICS VALUED COMPONENT (VC)

Demographics, population projections and forecasting are fundamental tools in community, land use, and emergency planning. Project spending and activities, and its workforce, all have the potential to change the demographics and population in local and regional communities. When these changes are substantial, different levels of government action may be required to modify policies, plans, or budgetary allocations to respond to a need for more or different services.

To mitigate the potential for adverse changes in population and related demographic factors during the Construction and Operation Phases the Project has committed to develop and implement an Education, Training, and Employment Program (refer to **SEMP**) that aims to increase the skill capacity of the local and regional labour force and to reduce barriers to employment for Indigenous workers. This program intends to include provisions to encourage development of a diverse workforce, and on-the-job training programs aimed at bringing local residents into the workforce that otherwise may not have the required qualifications. During the Construction Phase, the Project intends to utilize a modular design for Mine Infrastructure to reduce the required on-site workforce. This Project design optimization minimizes short-term temporary workforce fluctuations in population and avoids implementation of a workcamp or FIFO arrangements. Considering these design elements and mitigations, the small size of the Project's workforce during all phases, and population projections for the region, the Project's effect on a change in population and related demographic factors are assessed as **Not Significant**. The contribution of the Project's residual effects (**Table 6.1-2**) to a cumulative effect of a change in population and related demographic factors is also assessed to be **Not Significant**, since the small population changes are predicted to be consistent with and not to exceed current population projections for the RSA, as contributed to by projects in the MPI and community resiliency is rated as high.

8. FOLLOW-UP STRATEGY

No specific monitoring or follow-up strategies are recommended. However, the Project will continue to engage with local residents and Indigenous groups to address a range of interests, issues and concerns related to changes in population, including:

- ▶ employment and training opportunities;
- ▶ access for commercial, recreational and traditional purposes;
- ▶ infrastructure and services;
- ▶ housing availability; and
- ▶ community well-being.

Accordingly, follow-up strategies for other socio-economic VCs will contribute to monitoring of any adverse demographics-related effects. More information is also provided in the **SEMP**. The **SEMP** will provide guidance regarding community engagement and communications for the purpose of sharing information and maximizing the potential for local and regional workforce to benefit from the Project, while demonstrating the Project's contribution to community development. TCL will utilize the **SEMP** to verify that effects of the Project on socio-economic aspects are investigated annually and that the effectiveness and appropriateness of the proposed mitigation measures is confirmed. The **SEMP** will also help to identify any new or unanticipated adverse effects, if any, in addition to those expected in this **EAC Application**, and to identify and implement additional mitigation measures, if required.

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