6.2 LABOUR MARKET ASSESSMENT

This section presents the results of the assessment of potential Woodfibre Liquefied Natural Gas Project (Project) effects and cumulative effects on the labour market. The processes used to select the labour market as a valued component (VC), the assessment boundaries, and existing conditions relevant to the labour market are described. Assessment findings, including evaluation of Project-related interactions and likely adverse effects, proposed approaches to mitigation, identification of likely residual and cumulative effects, and determination of adverse effects significance are presented. Monitoring and follow-up programs to be undertaken with respect to the labour market are described.

This section is supported by the assessments in **Section 6.3 Sustainable Economy** and **Section 7.2 Infrastructure and Community Services** (see **Table 4-2 Component Linkages Matrix)**.

The assessment in this section supports the assessments in the following sections**:**

- Section 6.3 Sustainable Economy
- Section 7.2 Infrastructure and Community Services
- Section 7.4 Land and Resource Use
- Section 9.2 Public Health

6.2.1 Labour Market Scoping and Rationale

This section provides an overview of the labour market VC and its regulatory setting, the rationale for the selection of labour market as a VC, the spatial and temporal boundaries for its assessment, and the indicators used to determine potential effects to the market.

6.2.1.1 Overview and Regulatory Setting

The Labour market is defined here as the exchange of labour supply by workers for labour demand by employers. There are 26 pieces of labour-related legislation in British Columbia (BC). The regulation of the provincial labour market in BC takes place primarily through the following legislation:

- *Employment Standards Act*, RSBC 1996, c. 113 - Sets out standards for minimum wage and daily pay, breaks, compensation, overtime work, vacation and leave, employment age, collective agreements, and dispute resolution (refer also to Ministry of Jobs, Tourism and Skills Training 2014a).
- *Labour Relations Code*, RSBC 1996, c. 244 - Addresses collective bargaining and labour-management relations in BC, guaranteeing the right of all workers to join unions and the conditions through which this must occur.
- *Workers Compensation Act*, RSBC 1996, c. 492 - Sets out occupational health and safety requirements, the duties of employees and employers, as well as liability and compensation in the case of injury at work.

- *Industry Training Authority Act*, RSBC 2003, c. 34 - Established the Industry Training Authority (ITA) and describes its powers and responsibilities. The ITA administers BC's skilled trades system, working with employers, employees, industry, training providers and government to manage apprenticeships and credentials, set program standards and increase opportunities in the trades (see also ITA 2012).
- *Labour Mobility Act,* RSBC 2009, c. 20 - Allows trades workers certified in any Canadian jurisdiction to be recognized and to practice their profession in any province or territory.
- *Trade, Investment and Labour Mobility Agreement Implementation Act,* RSBC 2008, c. 39 - Under this *Act*, the provincial governments of BC and Alberta reconciled rules that can hinder the free movement of people, goods, and services between the two provinces, thereby allowing free movement to labour market elements.

In addition to the legislation listed above, the following labour market policies and programs are relevant to the Project:

The Red Seal Program sets common standards to assess the skills of tradespeople across Canada, and allows qualified tradespeople to practice designated trades in any province without having to write additional provincial-specific exams, thus improving labour mobility in Canada (HRDC 2012).

The Temporary Foreign Worker Program provides for hiring of foreign workers on a temporary basis to fill immediate skills and labour shortages if no Canadians or permanent residents are available. This program is administered jointly by Human Resources and Skills Development Canada and Citizenship and Immigration Canada.

Foreign skilled and experienced workers who wish to settle permanently in BC can apply under the BC Provincial Nominee Program, which expedites the permanent resident application process. Workers can apply under either strategic occupations or business categories. Examples of strategic occupations are managers, technicians and skilled trades. The program is administered on behalf of the Province of BC by the Ministry of Jobs under the authority of Citizenship and Immigration Canada (Ministry of Jobs, Tourism and Skills Training 2014b).

Under the federal *Canadian Human Rights Act*, RSC 1985, c. H-6, and the *BC Human Rights Code*, RSBC 1996, c. 10, it is not a discriminatory practice for an employer to give preferential treatment to Aboriginal persons in hiring, promotion, or other aspects of employment, when the primary purpose of the employer is to serve the needs of Aboriginal people.

6.2.1.2 Selection of Valued Component

Selection of the labour market as a VC followed a process as set out in **Section 4.3 Issues Scoping and Selection of Valued Components**. The selection of labour market as a VC reflects environmental assessment issues and guidelines, potential Aboriginal concerns, issues identified by BC Environmental Assessment Office, Canadian Environmental Assessment Agency, Aboriginal groups, and stakeholders, as well as professional judgment about key sensitive resources, and social and cultural values.

Labour market was selected as a VC because the Project is expected to generate direct, indirect, and induced employment opportunities during its construction, operation, and decommissioning phases. Beneficial effects may include increased employment at the local level, new trades training opportunities, and higher annual wage and salary levels and labour income. These benefits could be positively affected by Proponent-implemented enhancement measures; however, shortages in certain skills areas may also occur due to the Project during the construction and operation phases, and may require recruitment of workers from outside of BC, from other parts of Canada, or internationally, as well as enhanced training measures. The high incremental demand for labour for the Project during the construction phase may result in short-term labour supply constraints and thereby may ultimately increase labour costs for local businesses and lead to employee losses in some established operations.

6.2.1.3 Indicators

The key indicators and rationale for their selection are listed in **Table 6.2-1**.

Table 6.2-1 Key Indicators for the Labour Market

Category of Effect	Indicator	Rationale for Selection
Change in employment; Project associated labour requirements, including direct, indirect, and induced labour demand	Number of workers by occupation and industry affiliation and region of residence	Existing labour force characteristics indicate the extent to which Project labour requirements may be met from within the local assessment area (LAA) Project's labour demand characterizes the Project's initial effect on the labour market Employment stimulated by the Project's expenditures on LAA goods and services would increase the demand on the LAA labour force Unemployment rate vis a vis the natural rate of unemployment is an indicator of the status of balance in a labour market
Change in labour market balance; temporary or permanent in-migration of workers and/or labour market imbalance if the Project-associated labour demand cannot be met by the supply or capacity of the local or provincial labour forces	Participation and unemployment rates Difference between actual unemployment rate and natural rate of unemployment	
Change in labour income	Labour income	
Change in industrial training opportunities	Industrial training opportunities	

6.2.1.4 Assessment Boundaries

This section describes the spatial and temporal boundaries of the assessment of the labour market VC, as well as administrative or technical boundaries that apply.

6.2.1.4.1 Spatial Boundaries

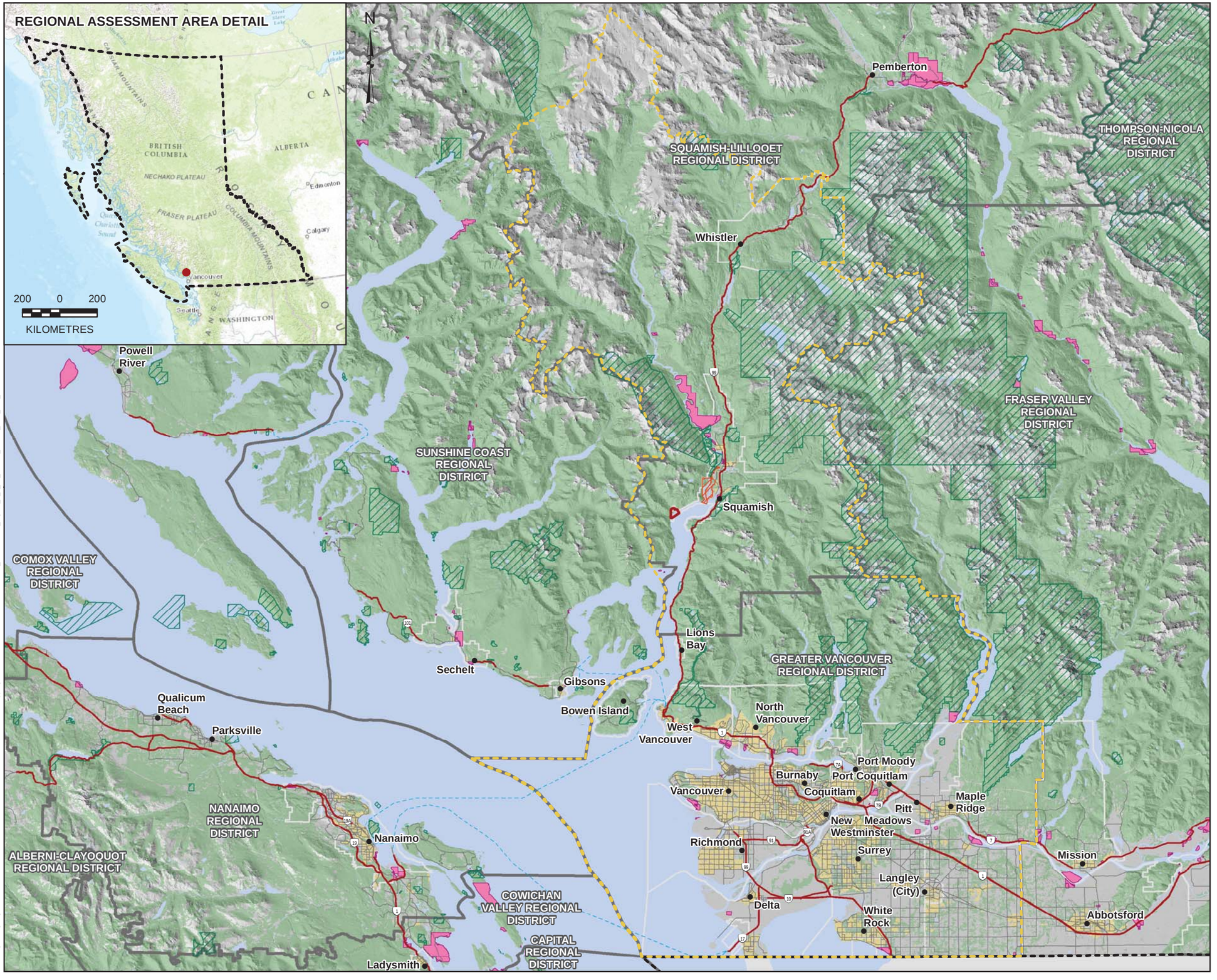
The spatial boundaries for assessment of the labour market have been selected to capture the physical extent of the Project, Project-related effects, and key environmental systems. The local assessment area (LAA) and regional assessment area (RAA) for labour market are defined in **Table 6.2-2** and shown in **Figure 6.2-1**. The LAA includes the District of Squamish (Squamish), Resort Municipality of Whistler

(Whistler), Squamish-Lillooet Regional District (SLRD) Electoral Area D, Squamish First Nation communities, and Metro Vancouver. The LAA was established to encompass the area in which the Project is expected to interact with and potentially have direct and indirect effects on the labour market. The RAA was established to provide a regional context for the assessment of Project-related effects, and encompasses both the LAA and the area in which the residual effects of the Project are likely to overlap with the residual effects of other existing or reasonably foreseeable Projects and activities. As a result, the RAA is the area for which the cumulative effects assessment has been conducted.

The primary work site for the Project during construction and operation phases is approximately seven km from Squamish's downtown area. The Darrell Bay ferry terminal will be within daily commuting distance of Whistler and Metro Vancouver area residences. A significant portion of the Project's labour demand during the construction phase is expected to be met by the labour supply in the LAA. The direct, indirect, and induced employment needs of the Project's operation phase are expected to be largely filled in the longer term from the labour pool within the LAA. The LAA and RAA boundaries for each VC are described in **Table 6.2-2** and shown in **Figure 6.2-1**

Table 6.2-2 Spatial Boundary Definitions for Labour Market

Spatial Boundary	Description of Assessment Area
Local Assessment Area	Squamish, Whistler, SLRD Electoral Area D, Squamish First Nation communities, and Metro Vancouver
Regional Assessment Area	BC
Cumulative Effects Assessment Area	BC



PATH: \\golder.gds\gal\Vancouver\CAD-GIS\VAN\2013\13-142213-1422-0006 - WoodfibreMapping\MXD\LandResourceUse\WOODFIBRE_ECONOMIC_Figure_6_2_01_Labour_Market_LAA_and_RAA.mxd Date: 10/14/2014 Time: 2:54:58 PM

LEGEND

- PROJECT AREA
- LABOUR MARKET LAA
- LABOUR MARKET RAA
- PARK / PROTECTED AREA
- SKEWLWIL'EM SQUAMISH ESTUARY
- FOREST AREA
- URBAN AREA
- INDIAN RESERVE
- REGIONAL DISTRICT BOUNDARY
- MUNICIPAL BOUNDARY
- HIGHWAY
- ARTERIAL ROAD
- BC FERRIES ROUTE
- COMMUNITY LOCATION

REFERENCE

PARKS/PROTECTED AREAS, MUNICIPALITIES AND REGIONAL DISTRICTS FROM GEOBC. BASE DATA FROM CANVEC © DEPARTMENT OF NATURAL RESOURCES CANADA. ALL RIGHTS RESERVED. HILLSHADE PROVIDED BY GOVERNMENT OF BRITISH COLUMBIA. BASE DATA COPYRIGHT © 20120912 ESRI AND ITS LICENSORS. SOURCE: DIGITALGLOBE WV02. USED UNDER LICENSE, PROJECTION: UTM ZONE 10 DATUM: NAD 83

SCALE

20 0 20

KILOMETRES

PROJECT

WOODFIBRE LNG LIMITED.
WOODFIBRE, HOWE SOUND, B.C.

TITLE

LOCAL AND REGIONAL ASSESSMENT AREAS FOR LABOUR MARKET

Golder Associates

PROJECT NO. 13-1422-0006			PHASE No. 5000	
DESIGN	RF	07 Apr. 2014	SCALE: 1:621,000	REV. 0
GIS	RH	10 Oct. 2014	FIGURE 6.2-1	
CHECK	AT	14 Oct. 2014		
REVIEW	DDB	14 Oct. 2014		

6.2.1.4.2 Temporal Boundaries

Temporal characteristics of the Project construction (including decommissioning of temporary construction-related facilities), operation, and decommissioning phases are defined in **Section 2.0 Proposed Project Overview** of this environmental assessment. The construction phase of the Project is expected to span a period of 24 months. The operation life of the Project is anticipated to be at least 25 years. If, after that timeframe, the Project can continue to operate in an effective and environmentally sound manner, plans will be developed for continued operation. Decommissioning at the end of Project life will last approximately 24 months. The temporal boundaries established for the assessment of Project-related effects on the labour market encompass all Project phases.

The temporal characteristics of the labour market VC are described in the existing conditions for this VC and relate to annual and seasonal trends. Temporal characteristics are also considered in the identification of the potential effects, and in the proposed mitigation measures.

6.2.1.4.3 Administrative Boundaries

The LAA and RAA for the labour market VC have been defined using municipal, First Nation, regional district, and provincial boundaries.

6.2.1.4.4 Technical Boundaries

There are no technical boundaries associated with this assessment.

6.2.2 Existing Conditions

This section describes the existing conditions of the labour market, based on the information collected.

6.2.2.1 Introduction

The potential labour supply for the Project consists of workers with the required skills and occupational training needed to undertake Project work. The labour supply may be drawn from residents living near each respective Project component, as well as from throughout BC, Canada, and internationally. In the case of the Project, labour market demand could have an effect on other VCs, such as infrastructure and community services. Labour demand corresponds to the number of positions of the requisite skills at the required time to construct and operate the Project, plus demand by supplier (i.e., indirect) and consumer (i.e., induced) industries.

Labour markets are dynamic, with fluctuations in both the number of persons in the labour force and the number of positions available from employers. Fluctuations can result in periods of labour surplus or labour scarcity. Forces inherent in the labour market, such as labour mobility and changing terms of employment, tend to restore the balance between supply and demand. Provincial and federal labour programming initiatives also play a role in improving efficient labour market functioning.

The main factors that describe the supply of labour are the number of people in the labour force by occupation and industry affiliation, participation and unemployment rates, and contribution of non-resident workers. The indicators characterizing Project-associated labour requirements are the estimated number of people needed to construct and operate the Project, and the incremental labour in companies supplying goods and services to the Project and providing consumer goods and various services to the Project's direct and indirect employment.

Since the interactions of the effects associated with past and existing projects are not expected to change over time, these projects are considered through the documentation of the existing conditions for this VC. A summary of the projects, the effects of which are included in the existing conditions, is presented in **Table 4-7 Existing Conditions – Past and Existing Projects.** Projects and activities that are considered in the existing conditions for this VC include the Britannia Mine Remediation Project, the Furry Creek Hydro Project, Howe Sound Pulp and Paper Corporation, Upper and Lower Mamquam Hydro Projects, McNair Creek Hydro Project, Sea to Sky Gondola, Sea to Sky Highway (Improvement Project), Squamish Terminals, Watts Point Quarry, Whistler Blackcomb Ski Resort, BC Ferries, recreational boating, forestry, fishing activities, backcountry and outdoor recreation activities.

6.2.2.2 Background Information

In 2014, Woodfibre LNG Limited (Proponent or WLNG) initiated desktop studies and interviews on labour market to support the Project planning and assessment, as well as future Project management. No field studies were required. Building on available information, these studies were designed to address known data gaps. Desktop reviews and interviews that were conducted with respect to labour market are summarized in **Table 6.2-3**.

Table 6.2-3 Summary of Desktop Studies and Interviews Related to Labour Market

Study Name	Study Purpose
Literature and baseline data review	Baseline economic data were collected from a range of information sources and analyzed. The main secondary sources included Statistics Canada Census (2001-2011); Statistics Canada National Household Survey (2013b); and Statistics Canada Labour Force Survey (2013f). The Statistics Canada Census and National Household Survey offer the most complete and reliable sources of labour market and economic data over time, and can be disaggregated to a certain extent by general and Aboriginal populations. The Labour Force Survey, published monthly by Statistics Canada and aggregated to annual levels, reports more recent labour force and unemployment rate statistics at the provincial and census metropolitan area levels, but does not offer data at the municipal level (e.g., Squamish). Local and regional economic and labour reports were used to characterize current and future economic development plans and labour market forecasts.
Interview program	Primary sources of information were phone interviews with representatives of provincial and municipal departments responsible for labour, economic development and marine use; local and regional economic development corporations; chambers of commerce; and tourism associations and tourism operators.

6.2.2.3 Description of Existing Conditions

This section presents existing labour market conditions for the LAA, with contextual references to all of BC, which is the RAA. Baseline information on labour force by industry and occupation, participation and unemployment rates, and income levels and training opportunities are also reviewed, with a labour market outlook.

6.2.2.3.1 Labour Force by Industry

Squamish's labour force totalled 10,270 workers in 2011. Metro Vancouver's labour force stood at 1,363,300 workers in 2013. In 2011, the construction industry was the largest labour force sector in Squamish with 1,430 workers (14.0%), while the key sector for Whistler was accommodation and food services (25.6%). This difference is attributable to Whistler's tourism focused economy (refer to **Table A-1** in **Appendix 6.2-1 Supplementary Labour Market Data**). Due to the extensive administrative and commercial activities of the Squamish Nation, public administration accounts for the largest portion of that community's labour force (30.2%). In 2013, Metro Vancouver's largest industry sector was wholesale and retail trade (16.3%). The 2011 distribution of occupations in Metro Vancouver was similar to the 2013 result.

Squamish and Whistler have had strong construction sectors in terms of labour force numbers since 2001. Between 2001 and 2006, the proportion of the construction sector labour force doubled in SLRD Electoral Area D, from 6.5% to 13.6%. In contrast, Squamish Nation's construction labour force contracted from 12.0% in 2006 to 8.3% in 2011. Participation in the construction sector labour force remained above the provincial average in each of these communities.

Table A-1 in **Appendix 6.2-1 Supplementary Labour Market Data** indicates that *other services* and *business services* were the top two industry sectors in terms of labour force size in each of the LAA communities from 2001 to 2006, which is consistent with BC as a whole.[1]

There were 1,363,300 workers in the labour force of the Vancouver census metropolitan area in 2013, representing 55.2% of the province-wide labour force. Between 2001 and 2011, the Vancouver census metropolitan area's labour force grew by 18.7% (annual average of 1.9%), while numbers in trade-related occupations increased at the slightly lower level of 17.3%. Sales and service occupations accounted for the highest proportion of the Vancouver census metropolitan area's labour force. Trade-related occupations accounted for 174,100 workers, or 13.7% of workers in the LAA, a lower percentage than in BC overall (15.3%).

[1] Since 2011, industry categories have been further refined, and are therefore not directly comparable to earlier data.

The construction sector's share of the total labour force in Metro Vancouver contracted by almost half between 2001 and 2013, from 14.6% to 7.7%, to approximately 98,000 workers. The provincial construction sector experienced a similar result, dropping from 15.5% in 2001 to 8.3% in 2013. The Metro Vancouver construction sector's share of the total labour force has been consistently below the sector's share on a provincial basis. This is likely attributable to the diversification of Metro Vancouver's economy as a key urban and trade centre for Western Canada, lingering effects of the 2008 recession, and rising retirement rates in the construction sector (WorkBC 2011a).

A large share of the province's oil and gas sector labour force (26%) resides in the Lower Mainland. Given the office based work for this sector in Metro Vancouver, this suggests a portion of these workers commute on a long distance basis for work to northeast BC and northern Alberta.

In BC, the *other services* and *business services* industry groups accounted for the largest sectoral labour forces in 2001 and 2006, respectively. From 2011 to 2013, workers in the retail trade represented the largest part of the labour force in the province, which is reflective of consumer purchasing as a main driver of the BC economy.

6.2.2.3.2 Labour Force by Occupation

Table A-2 in **Appendix 6.2-1 Supplementary Labour Market Data** presents the occupational profile for the LAA and RAA, based on available data from 2001 to 2013. The skill sets available within the local and regional labour forces can be established by analysing occupational trends. Key occupational categories reflect the industry structure of each of the local, regional, and provincial economies that are statistically portrayed in **Table A -1** in **Appendix 6.2-1 Supplementary Labour Market Data**.

Sales and service occupations accounted for the largest proportion of the labour force of each of Squamish, Whistler, and Squamish First Nation from 2001 to 2011, and for Metro Vancouver from 2001 through 2013. These trends are consistent with the prominence of the *other business service* industry group in the LAA communities from 2001 through 2006 (see **Table A-2** in **Appendix 6.2-1 Supplementary Labour Market Data**).

Between 2001 and 2011, approximately 20% of the Squamish workforce was employed as trades, transport and equipment operators, which exceeded the provincial level. To date, Squamish has not noted any labour shortage trends in local trades (District of Squamish 2014.). Squamish Nation saw a 1.9% decrease in the share of this occupational category (from 19.5% in 2006 to 17.6% in 2011), but its percentage share of trades, transport and equipment operators within its overall labour force remained above provincial levels in 2006 and 2011.

Although 55.3% of all workers in the province with trades, transport and equipment operator occupations were residents of the Mainland-Southwest Development Region (the region encompassing all of the LAA and the Fraser Valley) in 2010, the percentage share of this occupational group in Whistler and Metro Vancouver remained below the provincial level in all census years. Electoral Area D experienced a decline of 3.3% in the trades, transportation, and equipment-related occupations, falling from 16.1% in 2001 to 12.8% in 2006, which is below the average provincial share for these occupational categories in 2006 [2] (see **Table A-2** in **Appendix 6.2-1 Supplementary Labour Market Data)**.

The Whistler Chamber of Commerce has identified a consistent shortage in the availability of workers with construction focused occupational skills, as labour market demand for these skill sets in this community continues to exceed supply (Whistler Chamber of Commerce 2014). This is considered a problem inherent to resort-based economies, since a large number of workers are hired for seasonal work, and then laid off until the subsequent tourist season. The distance from Metro Vancouver's large labour force and competition for construction workers from this much larger economy contributes to this labour market issue in Whistler, which is exacerbated by the community's comparably lower levels of in-migration (Whistler Chamber of Commerce 2014).

Sales and service occupations accounted for the largest proportion of workers in BC from 2001 to 2013, increasing by 1.2% overall. The share of workers with occupations in trades, transport and equipment operations fluctuated over the same period, increasing from 14.3% to 15.3% overall and maintaining a strong presence within the provincial labour force (see **Table A-2** in **Appendix 6.2-1 Supplementary Labour Market Data**).

6.2.2.3.3 Labour Force Participation and Unemployment

Labour force participation (defined as the total labour force relative to working-age population) remained strong across the LAA compared to the provincial average for the 2001 to 2011 census period. Participation rates in each of Squamish, Whistler, SLRD Electoral Area D, and Metro Vancouver exceeded provincial averages in every census year from 2001 through 2011 (see **Table A-3** in **Appendix 6.2-1 Supplementary Labour Market Data**). Participation rates were relatively high in Squamish (76.1%) and Whistler (83.0%) in 2011, both more than 10% above the BC average of 64.6%, which is expected given the younger age profile of those two communities (average age of 37 years and 32 years, respectively). By comparison, Squamish Nation experienced a participation rate of 56.7%, which is approximately 10% lower than the provincial average. For Metro Vancouver and BC, the only regions for which labour force data were available in 2013, the participation rates were similar, at 65% and 64.1% respectively, which is expected given the relative importance of the Metro Vancouver labour force within the provincial labour force. The Metro Vancouver and BC participation rates remained static over the

[2] More recent data than 2006 for Electoral Area D are not available.

2001 to 2013 timeframe, declining by approximately 1%; Metro Vancouver's rate ranged from 66.2% in 2001 to 65.0% in 2013; the BC rate was 64.1% in 2001 and 66.8% in 2013 (Statistics Canada 2002a, b, c, d; Statistics Canada 2007a, b, c, d, e; Statistics Canada 2013a, b, c, d, e).

Most of the LAA communities saw their unemployment rates decrease between 2001 and 2006, then increase by 2011, likely a lingering consequence of the 2008 economic recession. Squamish and Whistler results followed this trend alternating above and below the provincial average. Unemployment rates in Squamish ranged from 7.3% in 2001 to 6.2% in 2006, before increasing to 8.7% in 2011 (830 workers). Similarly, unemployment rates in Whistler ranged from 6.2% in 2001, dropping to 5.3% in 2006, before increasing 8.7% in 2011. Squamish Nation also saw a 1.5 percentage point increase in its unemployment rate, growing from 15.1% in 2006 to 16.6% in 2011. Unemployment in the Squamish Nation was substantially higher than the province average of 7.8% in 2011.

Unemployment in Metro Vancouver also fluctuated over the period, but ultimately decreased by 0.6%, from 7.2% in 2001 to 6.6% in 2013 (approximately 90,000 workers). This was comparable with the overall BC experience, which registered an overall decrease from 8.5% in 2001 to 6.6% in 2013, albeit with fluctuations over this period.

6.2.2.3.4 Income

Table 6.2-4 describes median and earnings-based incomes in the LAA and RAA from 2000 to 2010 (plus 2013 for Metro Vancouver and BC). In all of the LAA communities, median total incomes rose over this period. Growth in the median total income in Squamish was strong, increasing from $26,046 in 2000 to $33,799 in 2010. Median total income growth was more modest in Whistler, increasing from $27,116 in 2000 to $32,432 in 2010 (19.6%). While data from 2011 are not available for SLRD Electoral Area D, between 2000 and 2005, median total income increased from $28,350 to $32,772 (16.6%). From 2000 to 2010, median total income in Metro Vancouver rose by 26.1%, ranging from $23,237 in 2000 to $28,726 in 2010, surpassing the provincial average change every year except 2010.

Between 2000 and 2010, the proportion of earnings derived from income decreased in the LAA except for SLRD Electoral Area D, which was consistent with provincial trends. While most communities saw changes of less than 3%, Whistler experienced a larger decline in its earning-based income of 11.4%. Whistler shifted from an unusually high proportion of earnings-related income (91.4%) to moderately high levels (80.0%); earnings-based income in this community still remained 6.3% above the 2010 provincial average of 73.7%.

Squamish Nation had a substantially lower median total income compared to the provincial average, at approximately $13,648 compared to $28,765. However, the proportion of earned income in Squamish Nation was comparable to BC in 2006 and 2011 (approximately 75.3% and 73.3%, respectively). The provincial median income increased by 28.5% between 2000 and 2010 growing from $22,095 to $28,765, but the proportion of income derived from earnings decreased from 75.8% to 73.7%.

Table 6.2-4 Median and Earnings-based Incomes in the Local Assessment Area and Regional Assessment Area (2001 – 2013)

	District of Squamish	Whistler	Squamish Nation [a,b]	Metro Vancouver	British Columbia	Electoral Area D[d]
2013[c]						
Median Income ($)	–[e]	–	–	29,300	28,400	–
Earnings as a percentage of total income (%)	–	–	–	–	–	–
2011						
Median Income ($)	33,799	32,432	13,648	28,726	28,765	–[d]
Earnings as a percentage of total income (%)	80.3	80.0	73.3	77.2	73.7	–
2006						
Median income ($)	30,326	29,550	9,892	25,032	24,867	32,772
Earnings as a percentage of total income (%)	79.3	81.2	75.3	78.0	75.1	85.8
2001						
Median Income ($)	26,046	27,116	28,350	23,237	22,095	–
Earnings as a percentage of total income (%)	83.7	91.4	83.2	78.7	75.8	–

Source: Statistics Canada 2013a, b, c, d, e; Statistics Canada 2007a, b, c, d, e; Statistics Canada 2002a, b, c, d;
Notes:

(a) Data on Squamish Nation are reported by Statistics Canada as the Squamish Indian Band Area. The Squamish Indian Band Area includes information from residents of Mission 1, Capilano 5, Seymour Creek 2, Chekwelp 26, Cheakamus 11, Kowtain 17, Seaichem 16, Stawamus 24, Waiwakum 14, and Yekwaupsum 18. Statistics Canada did not report on the Squamish Indian Band Area in the 2001 census, therefore data are not available.

(b) The Squamish Indian Band Area includes information from residents of Mission 1, Capilano 5, Seymour Creek 2, Chekwelp 26, Cheakamus 11, Kowtain 17, Seaichem 16, Stawamus 24, Waiwakum 14, and Yekwaupsum 18. Statistics Canada did not report on the Squamish Indian Band Area in the 2001 census, therefore data are not available.

(c) Income data for 2013 is derived from the Statistics Canada Labour Force Survey, which publishes data at the provincial and census metropolitan area levels only. Consequently, 2013 data for the District of Squamish, SLRD Electoral Area D, Whistler, and Squamish Nation are not available.

(d) Data for SLRD Electoral Area D for the census year 2011 have been suppressed for data quality or confidentiality reasons (Statistics Canada 2014)

(e) '–' Data not published by Statistics Canada for select year.

6.2.2.3.5 Training

Under the ITA, sector-specific training programs are offered for construction, resource, and transportation-related occupations. In 2012/2013, 34 programs were offered through the Construction Industry Training Organization; 22 programs were offered through the Transportation Career Development Association; and 16 training programs were offered through the Resource Training Organization (ITA 2011, ITA 2013a). Under the BC Jobs Plan, the province is also expanding opportunities for high school students to begin apprenticeships prior to graduation, with an aim to increase the number of high school graduates entering trades and technical programs by 50%. Moreover, the province also aims to attract 500 international students to trades and technical programs by 2015 (Government of BC n.d.).

The Government of BC has committed $500 million in annual training investment for key occupational sectors through the BC Jobs Plan, and is actively seeking to engage residents in trades and technical careers, investing over $100 million of these funds directly into trades training through the ITA (Government of BC n.d.). The BC Jobs Plan also stresses the importance of regionally-based skills development programs located close to prospective trainees.

The ITA has developed strategies to remove barriers to employment and increase participation in the trades for under-represented groups (e.g., women, immigrants, and Aboriginal peoples). These strategies include funding for school enrolment, childcare, transportation, work tools and equipment; mentorship; on the job training; high school graduation equivalency training, mobile training; pre-apprenticeship exposure to the trades, and the development of training partnerships with employers and industries all aim to diversify the sector (ITA 2013b).

One of two industries identified by the BC Jobs Plan as requiring skilled trades is the liquefied natural gas (LNG) sector. For this sector specifically, the BC Government has outlined how additional training will be required before provincial workers are prepared to meet the labour demands of this emerging industry. Through the BC Jobs Plan and BC's LNG Strategy, the province has pledged the following training-related resources to address this challenge:

- A labour market Partnership Agreement for a BC Natural Gas Workforce Strategy and Action Plan is under development by the BC Resource Training Organization (Ministry of Energy, Mines and Natural Gas 2014).
- A Targeted Skills Shortage Program has been established to help small and medium-sized employers develop training plans and fund worker advancement and retention. This program has engaged 1,200 participants in five growth sectors, including LNG (Ministry of Energy, Mines and Natural Gas 2014).
- Over $1 million have been invested in Employment Skills Access programs at BC public post-secondary institutions to provide eligible participants with tuition-free training for entry or re-entry into the labour market (Ministry of Energy, Mines and Natural Gas 2014). Approximately 250 participants have received training specific to the oil and gas sector to date (Ministry of Energy, Mines and Natural Gas 2014). LNG-related programs include the Oil and Gas Essential Skills Pre-employment Program (Government of BC 2012a).

With the support of the training policies, programs and initiatives described above, the ITA reported 35,041 registered apprentices in the BC trades training system as of March 2013. This represents approximately double the number of students involved prior to the establishment of the ITA in 2004. Although the number of registrants peaked in 2008/2009, the 2012/2013 figures exceed those of 2011/2012 (Government of BC 2012b; ITA 2013a). Of all apprentices registered with the ITA, 43% (approximately 15,068 apprentices) were located in the Lower Mainland region of BC, inclusive of the LAA (ITA 2013a). Between 2008 and 2013, the ITA provided trades and technical training to more than 1,800 Aboriginal people (ITA 2013a).

Opportunities for trades-related training are available through several college and university institutions in the LAA, including the following:

- BC Institute of Technology (BCIT) offers engineering and trades and apprenticeship programs with construction, transportation, electrical, and mechanical specializations (BCIT n.d.). BC Institute of Technology serves 18,000 full-time students and 28,000 part-time students annually in Metro Vancouver (BCIT n.d.).
- Kwantlen Polytechnic University maintains a Faculty of Trades and Technology, which offers carpentry, construction electrician, masonry, metal fabrication, millwright, parts and warehousing, plumbing, welding and automotive servicing programs. Apprenticeships are provided for most of these programs, excluding construction electrician, masonry, powerline and appliance servicing technicians (KPU 2014a). Kwantlen Polytechnic University serves over 17,500 students at its four campuses in Metro Vancouver (i.e., Surrey, Richmond, Langley and Cloverdale) (KPU 2014b).
- Squamish Nation Trades Centre offers a range of training programs through partnerships with Capilano University, Kwantlen Polytechnic University, Vancouver Community College, the First Nations Employment Centre and the ITA. Located in North Vancouver, the centre offers programs related to crane operation, metal fabrication, sheet metal, and welding (Squamish Nation 2013).
- The University of British Columbia (UBC) offers civil, chemical, electrical, environmental, integrated, materials and mechanical engineering programs (UBC n.d.). The University of British Columbia serves more than 58,000 students.
- Vancouver Community College offers automotive, commercial transport vehicle mechanic and heavy duty mechanic apprenticeships). The college serves over 22,000 students annually and operates three campuses in the City of Vancouver (Vancouver Community College n.d).

6.2.2.3.6 Labour Market Outlook

Trends in labour supply and demand that are important driving factors that strongly influence future labour market conditions in the LAA (Metro Vancouver, and the Squamish and Whistler areas) are described below.

- Metro Vancouver is the largest labour market in the province, the third largest in the country, and also relatively important within Canadian and American contexts.

- Metro Vancouver attracts the second largest inflow of immigrants in the country, and most of its population growth of over 9% between 2006 and 2011 came from this source. In 2010, approximately 38,000 people settled in BC, and almost 90% chose to stay in the Lower Mainland
- In recent decades, the trend is for people in BC to move from northern areas to southern communities, and the net flow of intra-provincial migrants is from north to south.
- Long distance commuting[3] is generally seen as a burgeoning trend. For example, 12% of the province's oil and gas industry labour force resides in the Thompson-Okanagan region, which has no local oil and gas exploration or development activity. Most of these workers commute long distances to northeast BC and northern Alberta. Although census data are available for inter-provincial and intra-provincial migration and local work commuting patterns, there are only limited data on long distance commuting patterns. A current estimate of net non-permanent residents for BC is 10,000 to 15,000 (Central 1 Credit Union 2014).
- Participation rates are affected by both the aging of the baby boomer generation and some older workers who choose to work longer for financial and health reasons (McQuillan 2013). Within Canada as a whole, participation rates for persons over 55 years of age have increased from 23.6% in the mid-1990s to 37.5% in 2014 (Bartlett and Burleton 2014).
- Most of the many major industrial construction projects in BC are proposed for communities and areas outside of the Lower Mainland.

Due to the large number of capital projects in the planning stages in BC, and increased demand for labour in the oil and gas industry developments in northern Alberta and Saskatchewan, many organizations and institutions have researched economy-wide or sectoral labour supply and demand matters either specifically for BC or for BC as part of the Canadian labour market (WorkBC 2011b, Asia Pacific Gateway Skills Table 2013, Buildforce Canada 2013, Business Council of British Columbia 2009, Conference Board of Canada 2013, Grant Thornton 2013, Human Capital Strategies 2012, 2013, Ingenia Consulting 2012, Petroleum Human Resources Council 2013a, b, c, d, TD Economics 2013, The Research Universities Council of British Columbia 2013, Central 1 Credit Union 2014, Department of Finance 2014, Office of the Parliamentary Budget Officer 2014, Premier's LNG Working Group 2014).

The Lower Mainland labour market is distinct within BC because of its relatively large size and, equally important, its dynamism: the region attracts large numbers of inter-provincial migrants and immigrants on the basis of its attractive quality of life and large, diverse economic base. Labour markets are relatively fluid within Canada and, as capital projects in the Lower Mainland come on stream, the potential to roll over work on these time delimited projects attracts workers on a permanent basis to the region. The main area of demand for new workers will come from attrition (69%), mainly through persons choosing to retire, but the expected level of investment in new projects is the factor driving concerns about tightening in the Lower Mainland region (Asia Pacific Gateway Skills Table 2013).

[3] This is when workers maintain a full-time residence in a community and live in temporary or rental accommodations while working in another area, either within BC or elsewhere in Canada.

The Asia Pacific Gateway Skills Table released a report in July 2013 with three investment scenarios that showed job openings varying by investment level; the level of attrition was fixed at one projected level. The low investment scenario demonstrated no labour market tightening in the Lower Mainland. Although the assumptions about the number and scale of major construction projects and business expansions and openings are difficult to predict, the attrition rate in the Lower Mainland is also affected by competition for workers from other regions and decisions about when to retire.

There is consensus that labour markets are tightening in BC and that certain regions and occupations are likely to experience imbalances when the major projects begin to come on stream until the labour demands from these projects diminish in the early 2020s (Central 1 Credit Union 2014).[4] Although there will be tightening in the Lower Mainland labour market within certain occupations as major projects come on-stream, the matter of an overall tightening and skills mismatches is tied to an imbalance between labour demand growth possibly outstripping labour supply growth. A 2011 projection from WorkBC had the Mainland-Southwest Development Region maintaining a labour surplus between 2014 and 2016. Looking forward, it is projected that 65% of all job openings in BC will be located in this development region. With growth projections of 1.6%, the region is expected to generate 666,300 job openings by 2020 (WorkBC 2011b). Consequently, a tightening of labour market conditions is anticipated in the LAA as labour demand is projected to outstrip the current labour supply projection by 2016 (WorkBC 2011b). By 2017, it is anticipated that the Mainland/Southwest Development Region (i.e., the region encompassing all of the LAA communities and the Fraser Valley) will have 11,550 job openings that may not be filled by projected growth in labour supply, increasing to 14,500 workers across all occupational categories by 2020 (unless current labour supply factors change).

A shortage does not mean that job openings will necessarily go unfilled. It does mean that open positions will require a longer time to fill, that there will be upward pressure on certain wages and salaries, and that employers will have to change how they operate. When employers cannot find all the workers they need, they respond by either substituting capital or technology for labour, or reducing their production or services. The number of workers attached to the shortage gives a sense of the scale of the labour supply problem and the pressure on labour markets, i.e., tightening (Antunes 2013).

Demand for tradespeople is tied to new capital projects coming on stream, so there is potential for both lesser and higher labour demands from this source based on investments coming on-stream or being delayed or cancelled. In 2010, the Mainland/Southwest Development Region accounted for 55.3% of all trades jobs in BC (251,340 positions). By 2020, this proportion is expected to increase to 57.4%, with approximately 63,430 new trades workers needed in the region (WorkBC 2011b). Approximately

[4] A common indicator to establish a balanced labour market on an economy-wide basis is the unemployment rate. The Alberta Government has put forth an unemployment rate of 5% as indicating a “balanced labour market”; 4.5% to 5% indicating a “tight labour market”; and less than 4.5% as indicating a “labour shortage” (Labour Force Planning Committee 2001). This level of 5% is based on the overall economy, and not focused on a single sector.

two-thirds of job openings in the Mainland-Southwest Development Region are forecasted to be replacement positions (e.g., filling vacancies left by retirees and people moving jobs) and one-third of openings will be new positions resulting from economic growth.

Increased demand for tradespeople is being brought on by large scale development projects anticipated across the province (BC Stats 2011). In February 2014, 47 major projects worth over $500 billion had been identified for construction between 2013 and 2023. These projects ranged in sectors and location, but will each require tradespeople and skilled labourers within the same general time period should they proceed (Premier's LNG Working Group 2014). Because most of these projects are major construction endeavours, such as the Site C Clean Energy project, Roberts Bank Terminal 2 project, natural gas pipelines and LNG facilities, the labour demand associated with them is seen as peaking in 2018 and shrinking in the early 2020s.

This labour market tightening means that a combination of different measures will likely occur, including additional immigration, additional in-migration from other provinces, BC residents who currently work in Alberta staying in BC to work, older workers choosing to work longer and thereby increasing the participation rate, wage rates rising to attract workers into BC or out of retirement, moving work from BC to other jurisdictions, substituting capital or new production processes for labour [5] and even delaying projects.

From a Lower Mainland labour supply perspective, there are two key factors contributing to a potentially tightening labour market. One is the realization of these expected capital projects and their associated labour demand. The second is the competition between regional labour markets for workers. Given its metropolitan quality of life, and wide range of living environments, from downtown Vancouver to rural areas in Squamish, Langley, and Maple Ridge, the Lower Mainland labour market is in a strong competitive position assuming offered wages and salaries are similar between other BC and Alberta markets. The expected tightening of regional and skills labour markets in other parts of BC and continued tightness in Alberta and Saskatchewan oil sand developments areas will lead to wage and salary inflation as projects and companies compete for workers.

In the province as a whole (i.e., the RAA), WorkBC predicted that 1,027,400 job openings will be generated between 2010 and 2020. The highest number of new job openings are anticipated in sales and service occupations (224,600); business, finance and administration occupations (182,000); and trades, transport and equipment operators and related occupations (153,300) (WorkBC 2011b). Two-thirds of these jobs (676,400) will result from replacement demand province-wide and one third of positions (351,000) will be newly created (WorkBC 2011b).

[5] This measure is generally being seen in the construction of LNG facilities around the world, with assembly of LNG facility modules undertaken in nations with ample labour and lower costs and marine transport of the modules to final sites.

Demand for workers province-wide, due to the major projects identified above, is expected to cause tightened labour market conditions, beginning in 2016 and extending through 2020. Unemployment rates will stay above 6% in 2015, but will subsequently fall below 5% in 2017, despite increased labour force participation rates (Central 1 Credit Union 2014).

The out-migration of BC residents for work in other provinces will reverse by 2015, as the economy continues to grow (Central 1 Credit Union 2014). Although the BC Jobs Plan identifies the need to attract new workers and increase training, observers see further opportunities to increase BC's training capacity (Business Council of British Columbia 2014).

Recent projections suggest that employment in the provincial construction sector will rise to record levels by 2017 in the event that construction begins on the projected LNG facilities and pipelines (Buildforce Canada 2013). Projections for 2014 to 2023 predict that the greatest shortages in the provincial construction industry will occur among construction managers, electricians, heavy equipment operators, heavy duty equipment mechanics, ironworkers and structural metal fabricators and fitters, plumbers, sheet metal workers, trades helpers and labourers, and truck drivers (Buildforce Canada 2013). Demand for trades workers is driven by the major projects identified above, which include investments in the LNG, oil and gas, mining, renewable electricity generation and transmission projects sectors across BC, particularly in the north (Buildforce Canada 2013).

As described in **Section 6.2.2.3.5**, efforts are being made by the provincial government through the BC Jobs Plan and BC's LNG Strategy to train additional tradespeople. The Premier's LNG Working Group seeks to involve 25% of the apprentice-able workforce in LNG-related construction projects, which will assist apprentices in becoming fully certified and contribute to LNG labour market development (Premier's LNG Working Group 2014). To prepare for increasing demands, the LNG Working Group has also recommended that the provincial government explore best practices for the attraction of a mobile workforce and of qualified workers from outside of Canada. It is hoped that the development of apprentice and journeyperson inventories will facilitate the transition of workers from one future major project to another, alleviating some labour force and training pressures (Premier's LNG Working Group 2014).

6.2.3 Assessment of Project-related Effects

This section describes the methods for characterizing potential effects, the potential interactions between the project-related activities and the labour market, mitigation measures to avoid and reduce potential interactions, and residual effects and their significance.

6.2.3.1 Assessment Methodology

The potential residual effects of the Project are assessed using the methodology outlined in **Section 4.0 Environmental Assessment Methods**. The assessment identifies potential interactions between Project activities and the labour market VC, any potential adverse effects, mitigation measures to avoid or minimize potential adverse effects, and residual adverse effects and their significance.

6.2.3.1.1 Residual Effects Characterization

Predictions of the Project's likely effects on labour market carry an element of uncertainty since many social and economic factors affect future conditions both with and without the Project, including how individuals' choices will affect their personal and community circumstances. Definitions for ratings applied to residual effects criteria developed with specific reference to the labour market VC are presented in **Table 6.2-5**.

Table 6.2-5 Criteria Used to Characterize Residual Effects on Labour Market

Criteria	Description	Definition of Rating
Magnitude	The amount of change in a key indicator or variable relative to baseline case	**Negligible** – Project will have no measurable change **Low** – effect cannot be distinguished from baseline case conditions **Moderate** – an effect that would result in demonstrable change, but remain within historic norms **High** – effect results in changes that are beyond historic norms
Geographic Extent	Spatial scale over which the residual effect is expected to occur	**Local** – effect restricted to LAA **Regional** – effect extends beyond the LAA into the RAA **Beyond Regional** – effect extends beyond the RAA
Duration	Length of time over which the residual effect is expected to persist	**Short-term** – <1 year **Medium-term** – 1 year to life of Project **Long-term** – > life of Project
Frequency	How often the residual effect is expected to occur	**Infrequent** – occurs once **Frequent** – occurs at irregular intervals **Continuous** – occurs on a regular basis and at regular intervals
Reversibility	Whether or not the residual effect can be reversed once the physical work or activity causing the effect ceases	**Fully reversible** – effect can be reversed **Partially Reversible** – effect can be reversed partially **Irreversible** – effect is permanent
Context	Capacity of socio-economic systems and processes to accept change relative to base case or baseline variation typically experienced	**Resilient** – the area and its labour market are resilient to adverse changes because they can respond appropriately to imposed stresses or because new agreements, infrastructure and opportunities can replace existing ones and overcome adverse changes **Not resilient** – the area and its labour market have little resilience to adverse changes and would resist imposed stresses poorly or new agreements, infrastructure and opportunities could not overcome adverse changes from the baseline

6.2.3.1.2 Definition of Significance

The significance of potential residual adverse effects was determined based on the residual effects rating assigned, the likelihood of a potential residual effect occurring, a review of background information and available field study results, consultation with government agencies and other experts, and professional judgement. The level of each residual effect has been rated as negligible, not significant, or significant, as follows:

Negligible (N)	Adverse effects determined to be negligible are those that are generally not measurable at the community or larger population level for labour market. Negligible effects are not carried forward to the residual effects characterization or significance section or the cumulative effects assessment.
Not significant (NS)	Adverse effects determined to be not-significant are those that are greater than negligible and that do not meet the definition of significant. Not-significant effects are carried forward to the cumulative effects assessment.
Significant (S)	An adverse effect of high magnitude in a context when the local labour market is deemed to be not resilient is considered significant. Significant effects are carried forward to the cumulative effects assessment.

The definitions above were adopted for the following reasons:

- In many cases, determining the significance of a residual socio-economic effect depends on the perceptions and values of affected people and communities (as made evident through consultation and engagement) with respect to their interpretation of significance, qualitative data and interpretation, and observations of the socio-economic environment of affected communities or populations, including the resilience of populations/communities to effectively address a residual effect.
- There are often no regulatory or widely accepted thresholds or standards for socio-economic VCs. Although it may be possible to set thresholds for some socio-economic effects for purposes of an environmental assessment, in many cases it is not possible to demonstrate consensus on a specific threshold value or what such a threshold means in terms of significance of an effect.
- Socio-economic effects may not lend themselves to the assignment of criteria for the determination of significance except in terms of potential, thus introducing a larger element of uncertainty into the effects assessment. For any predicted project effect, the actual effect that occurs will be dependent on the following:
    - the response on the part of individuals and communities to socio-economic mitigation and management measures implemented by a project
    - decisions made by individuals and communities with respect to events and situations that are unrelated to a project, but that interact with a project effect

- It can be difficult to conclude with certainty that mitigation measures will result in no residual effect. This is because, as mitigation measures are developed and implemented over the course of a project (particularly projects with long timelines), various social and economic changes take place, some of which can be difficult to predict during the assessment. In addition, some of the social and economic changes are outside the control of a project, but can interact with the project over its life cycle and, in some cases, affect the success of mitigation measures.

In summary, the challenges of (a) quantifying effects, (b) identifying thresholds, and (c) incorporating community resiliency, community perceptions and values in determining significance, coupled with the inherent uncertainty with respect to mitigation effectiveness and prediction of social and economic effects into the future, necessitates a mix of quantitative and qualitative approaches to determination of significance.

Likelihood refers to whether or not a residual effect is likely to occur (EAO 2013). The basis for likelihood is assessed using appropriate qualitative terms with applicable descriptions for how a conclusion was reached. The likelihood of potential Project-related residual effects occurring after mitigation is also characterized for the labour market using the following qualitative terms:

- **Unlikely** – past experience and professional judgement indicates that a Project-related residual effect is unlikely but could occur.
- **Likely** – past experience and professional judgement indicates that a Project-related residual effect is likely to occur.

Characterization of likelihood is based on past experience and professional judgement considering the available qualitative and quantitative data for each potential residual effect.

The level of confidence for each predicted Project-related effect is discussed to characterize the level of uncertainty associated with both the significance and likelihood determinations. Level of confidence is typically based on expert judgement and is characterized as follows:

- **Low** – judgement hampered by incomplete understanding of cause-effect relationships or lack of data
- **Moderate** – reasonable understanding of cause-effect relationships and adequate data
- **High** – good understanding of cause-effect relationships and ample data

Since there are many outside influences that can affect the magnitude and nature of the Project's effect on the labour market, such as population changes or national and global economic conditions, predictions of Project-related economic effects cannot be made with complete certainty.

6.2.3.2 Potential Interactions of the Project and Proposed Mitigation

Presented below are potential interactions between Project activities and labour market, and mitigation measures proposed to avoid or minimize adverse effects.

6.2.3.2.1 Potential Interactions

Potential interactions between Project-related activities and the labour market during the construction, operation, and decommissioning phases of the Project are identified in **Table 6.2-6**. The following criteria have been used to indicate the degree of the effect from the interaction between the labour market and each activity:

- No interaction is predicted.
- Minor interaction, (i.e., an adverse effect may result from an interaction, but standard measures to avoid or minimize the potential effect are available and well understood to be effective, and any residual effects are negligible).
- Carried forward to the assessment of residual and cumulative effects, meaning that the interaction may result in an adverse effect.

Rationale for the assessment of interactions rated as no interaction predicted or minor interaction are presented in **Table 6.2-5**. Interactions with potential effects rated as carried forward are discussed in **Section 6.2.3.2.2**.

With a few exceptions, Project-related effects on the labour market are largely in response to the totality of the Project and not to individual Project works and activities. Also, unlike environmental effects where there can be substantive differences between construction phase effects and operation phase effects, most economic effects occur on a continuum, from the initiation of construction activity through operation. Effects on individuals, businesses and communities are a result of the same processes in both phases. For example, Project direct labour requirements would begin with the start of construction and continue through the operation phase. Indirect labour demand associated with the Project's expenditures on goods and services would also occur throughout construction and operation. Where construction and operation effects, and associated mitigation and enhancement measures, are clearly different, these differences are noted in the assessment. For many of the effects, however, the assessment does not always differentiate between Project phases. Nonetheless, as decommissioning effects are quite distinct from those of construction and operation, these are presented separately.

Table 6.2-6 Potential for Interactions between Project-related Activities and the Labour Market

Project Activities and Physical Works	Labour Market Interaction	Nature of Interaction and Rationale for Interaction Rating
Construction Phase		
All Project construction phase activities and works	Carried forward	Change in employment due to Project-associated labour demand and capacity of the labour force to address the incremental demand Change in labour market balance Change in labour income Change in training opportunities
Operation Phase		
All Project operation phase activities and works	Carried forward	Change in employment due to Project-associated labour demand and capacity of the labour force to address the incremental demand. Change in labour market balance Change in labour income Change in training opportunities
Decommissioning Phase		
All Project decommissioning activities	Carried forward	Change in employment due to Project-associated labour demand

6.2.3.2.2 Potential Effects

Project activities and physical works that are carried forward, as noted in **Table 6.2-5**, may result in effects to the labour market VC. The potential interactions and their effect causes, type, nature, and direction are described in the following sections. The potential effects of the Project on the labour market are as follows:

- change in employment due to Project associated labour demand and capacity of the labour force to address the incremental demand
- change in labour market balance
- change in labour income
- change in training opportunities

Construction – Change in Employment due to Project Labour Demand and Capacity of the Labour Force to Address the Incremental Demand

The change in labour demand due to the Project would come from three sources: (1) direct employment, i.e., workers required to build and operate the Project; (2) indirect employment, (i.e., workers associated with production of goods and services consumed in Project construction and with the upstream production of inputs used in the production of these goods and services); and (3) induced employment, (i.e., workers associated with the consumer or household spending of the wages and incomes earned in Project-associated direct and indirect employment).

Woodfibre LNG Limited is expected to contract a firm or firms to fulfill the role of engineering, procurement, and construction management (EPCM) contractor. This entity would use its own employees, hire additional ones, and use sub-contractors and their employees to construct the LNG facility and terminal. This pool of employees would account for most of the Project's construction phase direct employment, and their work would be based at the Project site near Squamish. In addition, WLNG would have a small group of employees working directly on the Project to manage and administer the construction work.

The direct labour demand or requirements for Project construction in BC, based on estimates provided by WLNG, is estimated at 1,790 full-time equivalent (FTE) jobs over the planned 24-month construction period, or an annual average of 895 FTE jobs.[6] There would be three main groups of direct employment, as follows:

- Woodfibre LNG Limited employees – 140 FTE jobs mainly comprising engineers, project managers, and administrative staff.
- Construction workers – 1,000 FTE jobs, mainly comprising workers constructing the portions of the Project that will be built in BC, including site preparation, earthworks, utilities, piping, foundations, floating storage and offloading unit jetty, marine offloading facility, ferry jetty, and buildings.
- Liquefied natural gas facility module integration workers – 650 FTE jobs, comprising workers who will integrate the LNG processing facility modules when they arrive at the Project site.

Woodfibre LNG Limited's direct employment needs (expressed as FTE jobs) by year are anticipated to be 400 in 2015, 1,060 in 2016, and 330 in 2017. The construction period at the Project site extends over an estimated 24-month period, but work at the Project site is scheduled to substantively begin in June 2015. The full construction period includes fabrication and building of LNG processing facility modules, which is expected to occur in the Far East and begin in Q1 2015 (Woodfibre LNG Limited 2014).

In practice, many of the Project's construction workers would work for periods shorter than one year and not the full 24-month construction phase. Construction activity levels would vary over a year based on sequencing of construction tasks. Although work at the Project site is expected to be minimal in the initial months of 2015, there would be management and engineering work associated with construction in BC. There would be a rise in employment over the initial months (starting June 2015) of construction at the Project site. Projected employment would likely peak in Q1 2016 and then there would be a decline in employment through the first half of 2017, in the final months of construction.

[6] The employment estimates are calculated on the basis of FTE jobs. FTE jobs are estimated by aggregating employment terms of less than one-year into a full-year of employment equivalency (i.e., FTE for one year). Optional terms are FTE workers and person-years (PYs).

In general, the Project's EPCM contractor(s) would utilize experienced and skilled employees to the maximum practical extent because of construction schedule deadlines and WLNG's safety and construction quality expectations. These requirements lead to a demand for workers with suitable, large scale construction project skills and experiences. A large portion of the occupational skills required for on-site construction, approximately 85%, would fall into the tradesperson and equipment operator category. The estimated distribution of the occupational skills of the construction labour force is shown in **Table 6.2-7**.

Table 6.2-7 Occupational Skill Distribution of Construction Phase Labour Force

Occupational Category	Percentage Distribution (%)
Labourers	10
Construction equipment operators and oilers	5
Truck drivers	4
Form carpenters	6
Carpenter helpers	3
Steel fixers (concrete reinforcing steel installers)	5
Ironworkers	10
Ironworker welders	6
Millwrights	4
Pipefitters	10
Pipe Welders	6
Insulators	4
Sheet metal workers	6
Electricians	12
Instrumentation workers	6
Painters	3

Source: Woodfibre LNG Limited 2014.

Woodfibre LNG Limited anticipates sourcing the majority of its direct construction employment, approximately 60% (1,067 FTE jobs) from the LAA labour force. The large Metro Vancouver pool of workers is expected to be the main source, accounting for approximately 55% of direct construction employment, 990 FTE jobs. Approximately 82% of the Project's construction workforce is expected to be sourced from within Canada. The international workers would be at the Project site on a temporary basis and the bulk of them would have specialist skills associated with integration of LNG facility processing modules. The estimated number of direct FTE jobs by area of residence [7] for the construction phase is outline below in **Table 6.2-8**.

[7] The shown number of workers by area of residence is an estimate that is current as of September 2014 and is subject to change as planning for the Project progresses.

Table 6.2-8 Estimated Number of Direct FTE Jobs by Area of Residence for the Construction Phase

Area of Residence	Percentage of FTE Jobs (%)	Estimated FTE Jobs
Squamish-Whistler area	5	77
Metro Vancouver	55	990
Other areas of BC	7	133
Other areas of Canada	15	260
Areas outside of Canada	18	330
Total	100	1790

Source: Woodfibre LNG Limited 2014.

As well, the Project would generate indirect employment within the BC supplier industry businesses from which WLNG and its EPCM contractor(s) directly purchase goods and services. There would also be incremental indirect employment in BC due to the direct suppliers buying BC produced goods and services as inputs for their production activities. [8]

Only employment in BC that is associated with the manufacture and integration of machinery and equipment and the supply of goods and services is included in the economic impact assessment. The Project's purchased goods and services would include concrete, gravel, fuel, food supplies, reinforcing steel, structural steel, piping, general building supplies, and engineering and transport services for example but the largest expenditure category would be LNG processing facility machinery and equipment. WLNG would order the fabrication and assembly of customized LNG processing machinery and equipment from specialized manufacturers. Most of this LNG production equipment and machinery is expected to be manufactured and assembled as modules outside of Canada, because there is no option to purchase this equipment in Canada, and then the assembled modules would be transported by ship and barge to the Project site.

[8] The inputs used for making concrete provide an example of upstream production. Concrete would be used for building the facility's foundations so there would be direct supplier employment associated with concrete manufacture. In addition there would be indirect upstream employment associated with extracting or making the inputs used in concrete manufacture (e.g., Portland cement, sand and gravel); and indirect employment further upstream associated with making or extracting the inputs used in Portland cement production (e.g., limestone, gypsum, clay and fly ash).

The estimated indirect employment in the LAA associated with the Project's expenditures on goods and services for constructing the LNG processing facility and marine terminal is 375 FTE jobs. Indirect employment in BC (which includes the LAA) associated with the Project's construction phase expenditures on goods and services produced in the province is expected to be an estimated 682 FTE jobs[9].

Another labour market effect is the induced employment associated with the consumer and personal services spending that is supported by the wages and incomes of the Project's direct and indirect employment. This spending would help support an estimated 342 FTE jobs in the LAA and in BC overall, an estimated 475 FTE jobs of induced employment.

Estimated total employment in BC resulting from Project construction is 2,357 FTE jobs over the 24 months of construction, or an annual average of 1,178 FTE jobs. The majority of the BC workers are expected to be LAA residents; total employment in the LAA employment is expected to be 1,784 FTE jobs (annual average of 892 FTE jobs), or 76% of the BC employment anticipated to be associated with constructing the Project. These Project-associated labour demand changes are predicted to generate a beneficial effect on employment in the LAA during the construction phase. Consequently, due to the likely beneficial effects of the project on this labour market component the potential for adverse project-related effects on this component is not carried forward for further adverse effects assessment.

Operation – Change in Employment due to Project Labour Demand and Capacity of the Labour Force to Address the Incremental Demand

Woodfibre LNG Limited foresees two stages of direct labour requirements for Project operation: an initial two-year period having a higher employment level due to training of local workers in LNG facility operation, followed by the long-term second stage of the operation phase, during which employment needs would drop by approximately 25%.

9 The direct employment and labour income estimates for the construction and operation phases are based on expenditure and employment estimates developed by WLNG as part of the Project's planning. These estimates may change as new information comes forward or the Project's features, structures or processes change. The indirect and induced output, employment and labour income effects for the construction and operation phases were estimated through use of these direct spending estimates and input-output (I/O) multipliers for BC Statistics Canada's input-output model of the Canadian and provincial economies underlies the industry-specific multipliers that were used in the economic impact modelling (Statistics Canada, Industry Accounts Division 2014). This model is based on detailed information collected by Statistics Canada about the flow of goods and services among the many industries of the national and provincial economies. This information provides comprehensive and detailed representations of the national and provincial economies for 2010, including industry production functions. Multipliers for BC industries that corresponded with the various spending categories were used for the indirect and induced impact calculations. For example, one of the multipliers used in the construction phase estimate was the "*other engineering construction*" industry multiplier and it was applied against the Project's spending on the services of this industry to help estimate some of the construction phase's indirect and induced effects. An example from the operation phase impact calculation is the use of the "*conventional oil and gas extraction*" industry multiplier as the Project will source natural gas from BC as feedstock for the LNG processing facility and there would be indirect and induced economic effects of the Project associated with Project spending on the natural gas produced by this industry in BC.

The BC and LAA effects were estimated by WLNG related to sourcing of its workforce and the geographical pattern of its spending on goods and services, including machinery and equipment. The LAA's shares of indirect and induced output and employment were calculated with estimates of the regional shares of BC industry employment. In most cases, the proportion is based on the region's share of total employment by industry but for certain industries, such as "*investigation and security services*", employment is assumed to be locally supplied.

Woodfibre LNG Limited expects that direct employment at the LNG facility would total 130 FTE jobs per annum during the initial two-year period, and a majority, an estimated 70% or 90 FTE jobs per year, would be filled by workers sourced from the LAA. The other 40 direct FTE jobs per annum supported by the Project would be associated with specialized qualification needs related to LNG production, and workers would be sourced from outside the LAA, including internationally, to fill these positions. Employment would be higher during this two-year period to provide for specialized training to a portion of the workers sourced from the LAA. Woodfibre LNG Limited expects that the number of positions filled by international workers will be reduced over time as local workers are trained.

The long-term operation phase is anticipated to provide for 100 FTE jobs on an annual basis, and all workers at this point are expected to be LAA residents. Annual direct employment at the Project's LNG production facility is expected to fluctuate within a narrow range over the minimum 25 year facility life and be linked to LNG production volume.

Most of the operation phase employment is expected to consist of skilled positions. There are expected to be supervisors, various technicians, facility operators, safety and security staff, marine staff, work management, and logistics personnel.

In addition to direct employment effects, there is expected to be indirect employment supported by the Project's goods and services spending to sustain operation of the new LNG facility. Project spending is anticipated to support an estimated 185 FTE jobs of indirect employment annually in the LAA in year three and thereafter.

There is expected to be variance in employment associated with goods and services production from year to year, largely based on capital replacement needs and spending. Indirect and induced labour demand in the LAA, supported through project associated spending during the operation phase, is expected to be completely filled from the available and qualified labour supply in the LAA.

The consumer and personal services spending of wages and incomes earned by direct, indirect and induced employees associated with the Project would generate an estimated 78 FTE jobs per annum in operation phase year three and thereafter in the LAA

Total employment in the LAA in year three and thereafter during the Project operation phase is estimated at 363 FTE jobs (100 direct FTE jobs plus 185 indirect FTE jobs plus 78 induced FTE jobs). There is an anticipated total of approximately 1,615 FTE jobs in BC supported annually via Project spending on labour, goods and services. These Project-associated labour demand changes are predicted to generate a positive effect on employment in the LAA during the Project operation phase. Consequently, due to the likely beneficial effects of the project on this labour market component the potential for adverse project-related effects on this component is not carried forward for further adverse effects assessment.

Construction and Operation – Change in Labour Market Balance

Project-related effects on the local labour markets will depend on the capacity of the local labour force to meet local labour demand while the overall labour market in the LAA stays in balance. WLNG's employment arrangements during the construction phase would directly influence the responses of local and non-local labour supply and therefore are incorporated into the assessment of likely Project-related effects. In addition to Project wage levels, these employment arrangements could include provisions for worker travel, accommodation, and shift rotations. The planned worker travel, accommodation, and shift arrangements during the Project construction phase are as follows:

Worker travel – WLNG will provide free access to a regularly scheduled ferry service from the Darrell Bay terminal to the Project site. Workers will be responsible for their own transportation from their permanent or temporary place of residence in the LAA. Woodfibre LNG Limited does not plan to provide a fly-in-fly-out air service for non-local BC or other Canadian workers. Woodfibre LNG Limited will provide travel allowances, as part of a compensation package, to non-local workers.

Worker accommodation – WLNG expects all workers to have or arrange their own accommodation and will not be providing temporary accommodation, such as an on-site camp. Woodfibre LNG Limited will provide living out allowances, as part of a compensation package, to non-local workers.

Shift rotations – Subject to discussions with labour representatives and further Project planning, WLNG intends to implement a daily 10-hour shift for the construction phase and will utilize shift rotations that are typically seen in the construction of major industrial facilities in Western Canada.

Woodfibre LNG Limited expects to source a majority (60%) of the construction phase direct workforce (1,067 FTE jobs), from the LAA. This level of local sourcing is feasible due to the large pool of construction sector labour in the Metro Vancouver area (see **Section 6.2.2**). Although the construction sector labour forces in Squamish and Whistler are proportionately large in local terms, it is the presence and availability in the LAA of the extensive pool of experienced construction workers in Metro Vancouver that would drive LAA labour sourcing. The proximity of a large pool of construction labour is an important differentiating feature between the Project and the other LNG projects proposed for BC, which are located near smaller communities, and would require the temporary in-migration of large numbers of outside workers. WLNG would not rely solely on the LAA labour to obtain its direct construction workforce: an estimated 40% of direct construction employment would be sourced from outside the LAA.

Other factors that are expected to influence the geographic composition of the Project's direct construction workforce is the absence of either a fly-in-fly-out air service or Project provided temporary accommodation. These absences are anticipated to limit the number of non-local workers who seek construction phase employment.

Almost all Project-associated indirect and induced employment in the construction phase that is based in the LAA (an estimated 717 FTE jobs) is anticipated to be sourced from the pool of available and qualified workers residing in the LAA. A few indirect workers may be recruited to assist with Project-related work, but the large Metro Vancouver labour pool is expected to be the primary source of labour.

In the long-term, WLNG expects to source all operation phase workers from the LAA. In addition, all indirect and induced employment in the operation phase is anticipated to be sourced from the LAA labour pool, amounting to an estimated total of 363 FTE jobs.[10]

There are a few factors that determine the available pool of workers to support new work in a metropolitan economy: worker reallocation, unemployment, part-time employment, and labour force participation. Labour force capacity is dynamic, especially in the construction sector, in that there are high levels of both hiring and worker separations, i.e. workers quitting, being laid-off and retirements (a process referred to as worker reallocation) and changes in labour market attachments. This process is a fixture of the labour market and typically the quit rate is actually higher than the layoff rate in a large economy (Shimer 2005). In the case of job quits, this process creates vacancies that job seekers can step into. The annual rate of worker reallocation within the Canadian construction industry has been estimated as approximately 56% (i.e., a hiring rate of 30.9% and a separation rate of 25.1%) (Morrisette, Lu, and Qiu 2013). This situation is expected because of the project structure of construction work, and reflects a high flow of workers who move from project to project. This high rate, although not specific to the BC Lower Mainland, is likely applicable to it and speaks to the availability of workers within its large construction labour force to fill direct labour requirements of the Project as a previous project comes to a close.

A factor in local capacity is the number of qualified unemployed persons within an LAA community in excess of a 5% natural rate of unemployment.[11] The local unemployment rate during the Project construction phase would depend on the state of the regional economy at that time. The baseline information shows an overall unemployment rate in the 6.6% range for Metro Vancouver and the Squamish-Whistler areas (see **Section 6.2.2**). The difference between that rate and a 5% natural rate of unemployment amounts to almost 22,000 unemployed workers in Metro Vancouver. Only a portion of

[10] In and of itself, an FTE job should not be interpreted as a permanent or long-term, sustaining job unit of measurement. However within the Project operation phase, an estimate of FTE jobs can be taken as a proxy estimate of the number of ”permanent” or ”long-term” jobs of a project or program. The short-term structure of construction employment precludes assigning an estimate of “permanent" or ”long-term” jobs to a project or program based only on FTE jobs.

[11] The natural rate of unemployment is the level of unemployment in an economy that is operating at full capacity and its wage increases are gradual and not inflationary. There is unemployment in this scenario because of the time required to find a job, some job seekers will hold out for a higher wage or a certain job and some persons are unwilling to move to accept new employment for a variety of reasons. The Conference Board of Canada (2007) estimated the natural rate of unemployment in Ontario as 5.2%. The Alberta Government has put forth an unemployment rate of 5% as indicating a “balanced labour market” (Labour Force Planning Committee 2001). The natural rate of unemployment provides a guide as to when an economy is in a tight labour market situation but other labour market factors, such as participation rates and worker reallocation rates, are also considerations in determining available labour market capacity to adjust to incremental labour demand.

these job seekers would be qualified for direct construction employment but there would be Project-associated indirect and induced employment positions requiring lower qualifications, and likely having long-term employment prospects, since operation phase spending in the LAA would start as construction phase spending is winding down.

Labour force attachment is another factor that affects labour force capacity. There are persons who share some characteristics of the unemployed but do not fit all the criteria in order to be classified as such. There are part-time workers who want full-time work and are available to do so; persons available to work but not seeking work, such as discouraged workers and recently retired workers; and persons seeking work but not immediately available, which is the smallest segment.

The participation rate signals the potential number of persons available to work but not seeking work. The participation rates in Squamish and Whistler are relatively high but the Metro Vancouver rate (65% in 2013) could increase based upon the potential of attractive employment opportunities drawing workers back into the local labour force.

There is potential for part-time workers to move into full-time employment with the advent of a major project generating a range of direct, indirect and induced employment opportunities. The part-time employment rate in BC was 21% in 2013 (Statistics Canada 2013f).

Based on these labour supply and capacity conditions in the LAA, there is expected to be sufficient capacity within the LAA labour force to meet the expected hiring demand for LAA labour from the Project during both construction and operation phases. In the event that constraints in sourcing labour from the LAA become evident, then WLNG expects to augment the local labour supply through additional recruitment from labour pools outside of the LAA. WLNG's current estimate is that approximately 40% of the direct labour needs in the construction phase would be filled by workers from outside of the LAA, including a group of internationally sourced workers. Large construction projects in BC in the past decade have consistently demonstrated the efficiencies of the labour market by using mobile workers to supplement what is available locally. A low unemployment rate in the LAA would help demonstrate that use of local labour is being maximized.

A labour supply factor for the Project is that it is scheduled to start in June 2015, well in advance of the other major oil and gas projects being planned for BC. As well, it is expected to start in advance of other planned major Lower Mainland projects, such as the Fraser River crossing that will replace the George Massey Tunnel and the Roberts Bank Terminal 2 Project.

For the reasons described above, it is likely that the Project construction and operation activities will have a negligible adverse effect on the labour market balance in the LAA. Sourcing of labour in the LAA for the Project is maximized while not putting the labour market in the LAA out of balance, and furthermore,

some Project direct labour requirements will be sourced through non-local recruiting. Consequently local skills profiles and labour participation rates in the LAA will be enhanced. The likely negligible adverse effect on labour market balance in the LAA due to Project-related activities in the construction and operation phases is therefore not carried forward for mitigation.

Construction and Operation – Change in Labour Income

Annual labour income levels for constructing the facility are expected to be consistent with compensation (wages/salaries and benefits) on an FTE job basis with other major industrial construction projects in the province. WLNG has found that the average labour income per FTE job for the Project's direct construction workers is expected to be in the range of $200,000[12] per year for total compensation rewards. Annual compensation for indirect and induced workers would be in the typical range for these types of positions in the businesses that support industrial construction in the LAA and the province, i.e., an estimated $66,000 per FTE job for indirect workers and $47,000 per FTE job for induced workers.

The labour income in the construction phase associated with the almost 1,100 FTE jobs of direct employment estimated to be sourced from the LAA would total approximately $300 million. The distribution of the direct labour income within the LAA would depend on the community of residence of LAA workers. The Squamish-Whistler area is expected to account for about 7% of direct LAA construction employment, so its share of direct labour income would in the same range.

Taking into account the estimated indirect and induced labour income associated with the Project in the LAA of $41 million, the total labour income supported by the Project in the LAA is anticipated to be approximately $340 million over the 24-month construction phase.

Woodfibre LNG Limited anticipates that the average labour income per FTE job for the Project's direct operation phase workers will be, on average, about $100,000 per year (which includes direct salary plus an additional 25-30% for medical, sick leave, vacation and any other benefits). WLNG foresees 100 FTE jobs over the long-term operation of the Project and all positions are expected to be filled by persons who reside in the LAA. Direct labour income would be an additional $10 million, which would comprise approximately $7M in direct salaries plus $3M in indirect employee costs per annum in the LAA as a result of the Project. It is likely that most direct operation phase workers will reside in the Squamish area for convenience of commuting to work. Assuming that 75% of these workers reside in Squamish, there would be an additional $7.5 million of labour income injected into the Squamish economy. Employment associated with operation of the LNG facility would boost average wage and salary levels noticeably in Squamish because it is a smaller community in the LAA than Metro Vancouver.

[12] Total compensation rewards include direct salary, indirect employement costs, benefits and overtime. Total compensation is calculated based upon a construction worker working 50 hrs per week, 52 weeks of the year.

An estimated $23.5 million in total labour income per year over the long-term is anticipated to be generated in the LAA due to Project spending on labour and goods and services. These Project-associated labour income changes are predicted to generate positive effects in the LAA during the construction and operation phases. Consequently, due to the likely beneficial effects of the project on this labour market component the potential for adverse project-related effects on this component is not carried forward for further adverse effects assessment.

Construction and Operation – Changes in Training

The effects on education and training during the construction and operation phases are addressed collectively as effects during the construction phase are bounded by the operation phase. Project-related training initiatives are expected to be initiated during the construction phase, but be relatively limited due to the limited time period, the short work stints expected for many construction workers, and the financial importance of starting production within the projected time frame. Since the Project operation phase is expected to stretch over at least 25 years, however, there would be opportunities for on-the-job and classroom-based training that is either directly provided or supported by WLNG.

The high capital cost of constructing the LNG facility and marine terminal, with no incoming revenues until production starts, necessitates tight construction schedules; however, WLNG anticipates opportunities for on-the-job skills upgrading within the constraints of the Project schedule.

The skill requirements for many LNG facility operation positions would necessitate that insufficiently qualified local residents will need to obtain the requisite training to secure a position with the LNG workforce. As mentioned above, WLNG has provided for a larger facility workforce in the initial two years of the operation phase, in part so that workers with specialized training that are brought from outside of the LAA can train LAA-based workers.

Woodfibre LNG Limited will have a formal and comprehensive training plan and is committed to recruitment and training that maximizes employment opportunities available to local residents. WLNG's training efforts will include an apprenticeship program developed in accord with the operational requirements of its business and the *Industry Training Authority Act*, SBC 2003, c. 34.

For the reasons described above, it is likely that a beneficial effect on training in the LAA will result from the Project during the construction and operation phases. This conclusion is based on the availability of educational initiatives for industrial training in the LAA, including BC government supported programs, and skills upgrading obtained in association with employment at the LNG facility, or in anticipation of employment with the Project, which would be incremental to existing conditions. The scope of this Project associated additional training cannot be estimated at this time but WLNG's commitments are likely to result in concrete improvements in training within the LAA, especially in the Squamish area, over the life of the Project. Consequently, due to the likely beneficial effects of the Project on this labour market component, the potential for adverse Project-related effects on this component is not carried forward for further adverse effects assessment.

Decommissioning - Change in Labour Demand

It is not possible to accurately predict what conditions in the LAA will be 25 years or more in the future, particularly in terms of labour supply and demand. With Project decommissioning, few direct and indirect jobs are anticipated to remain with the Project; however, ending production and dismantling of the LNG facility at the Project site is not anticipated to result in a reduction of employment opportunities in the LAA below existing conditions. Compared to existing conditions, no adverse effects on the labour market in the LAA are likely to result from the Project during the decommissioning phase. Consequently, due to the fact that the decommissioning phase of the project is not likely to result in adverse effects on this labour market component, the potential for adverse Project-related effects on this component is not carried forward for further adverse effects assessment.

6.2.3.3 Proposed Measures to Enhance Potential Beneficial Effects

The Project is likely to have beneficial effects for the labour market in the LAA. These beneficial effects are new employment, additional labour income and training opportunities in the LAA created through the Project's hiring for the LNG facility and spending on goods and services during the construction and operation phases. Adverse effects are not anticipated.

Woodfibre LNG Limited has committed to undertaking a local hiring strategy and a local training strategy, as described in **Section 2.6 Project Benefits**, to enhance the likelihood that LAA residents are well-positioned to seek these opportunities based on their individual capacities to supply the needed skills on a timely basis. In addition, WLNG will monitor the progress of the local hiring strategy and the local training strategy and issue an annual report on hiring and training results for the Project construction and operation phases. With implementation of these benefit enhancement measures, the Project is expected to offer fair and equitable access to Project employment opportunities for interested residents of the LAA communities.

6.2.3.4 Summary of Residual Project Effects and Residual Cumulative Effects

Residual and cumulative effects assessments were not required for this VC, since the Project is anticipated to have positive effects on the Labour Market VC during construction and operation, and no adverse effects during decommissioning. Opportunities will be created for employees, businesses, and contractors directly involved in Project construction as well as for those involved in industries and activities that would benefit from indirect and induced expenditures. All Project effects on the labour market in the LAA are expected to be positive, and further enhanced through WLNG-implemented benefits enhancement measures. These beneficial effects will include positive change in employment, labour income, and training opportunities.

There are no changes to the labour market VC that occur within federal jurisdiction. There are no changes to infrastructure and community services that will occur on federal or trans-boundary lands. No federal permits or approvals are required for infrastructure and community services for this Project to proceed.

6.2.4 Monitoring and Follow-up Programs

As per the local hiring strategy and local training strategy, WLNG will carry out the following:

For the construction phase – Require the EPCM contractor to annually report to WLNG on employment and procurement information, including employee search efforts (job fairs, etc.), worker and contractor selection process, employment numbers, training investments, value, and content of contracts – as a percentage of total hiring and procurement.

For the operation phase – WLNG will prepare an annual report for the first two years of operation on employment and procurement information, including employee search efforts (job fairs, etc.), worker and contractor selection process, employment numbers, training investments, value and content of contracts as a percentage of total hiring and procurement.

General – Undertake regular corporate reviews of the above initiatives to identify barriers to employment, and to support additional benefit enhancement response measures.

6.2.5 References

Antunes, P. 2013. Don't be Fooled by 7% Unemployment. Available at http://www.theglobeandmail.com/report-on-business/economy/economy-lab/dont-be-fooled-by-7-unemployment-a-labour-shortage-is-coming/article15280766/. Accessed August 2014.

Asia Pacific Gateway Skills Table. 2013. Lower Mainland labour market Requirements for the Asia Pacific Gateway, 2013-2022. Available at: http://www.apgst.ca/projects/pdfs/LowerMainlandLabourMarketRequirementsfortheAPG2013-2022.pdf Accessed June 2014.

Bartlett, R. and D. Burleton. 2014. Part-Time Nation: Is Canada Becoming a Nation of Part-Time Employed?. TD Economics Observation. Available at http://www.td.com/document/PDF/economics/special/Part_time_Nation.pdf. Accessed September 2014.

BC Institute of Technology (BCIT). n.d. Trades and Apprenticeship. Available at: http://www.bcit.ca/path/trades/. Accessed July 2014.

BC Stats. 2011. BC Trade Occupations Outlook: 2010-2020. Available at: http://www.workbc.ca/WorkBC/media/WorkBC/Documents/Docs/BC_tradesoccupationoutlook.pdf Accessed June 2014.

Buildforce Canada. 2013. Construction and Maintenance Looking Forward: 2014-2023 Key Highlights: British Columbia. Available at: http://www.buildforce.ca/en/system/files/products/2014_BC_Constr_Maint_Looking_Forward_0.pdf. Accessed May 2014.

Business Council of British Columbia. 2009. Where will the workers come from? British Columbia Labour Force projections to 2030. Available at: http://www.bcbc.com/content/549/2020_200909_PeacockFinlayson.pdf. Accessed June 2014.

Business Council of British Columbia. 2014. BC Economic Review and Outlook. Available at: http://www.bcbc.com/pdfs/BCERO_2014_01%20Final.pdf. Accessed May 2014.

Central 1 Credit Union. 2014. Economy Analysis of British Columbia. Volume 34, Issue 1. Available at: http://www.central1.com/sites/default/files/uploads/files/analysis_report/report_file/ea%202014_01%20bc.pdf. Accessed July 2014

Conference Board of Canada. 2013. Skills In Motion: U.S. Workers May Hold the Key to Canada's Skills Shortage. Available at http://www.conferenceboard.ca/e-library/abstract.aspx?did=5784. Accessed June 2014.

Department of Finance. 2014. Jobs Report: The State of the Canadian labour market. Available at: http://www.budget.gc.ca/2014/docs/jobs-emplois/pdf/jobs-emplois-eng.pdf. Accessed June 2014.

District of Squamish. 2014. Personal communication with District of Squamish and Golder Associates Limited. July 4, 2014

Environmental Assessment Office (EAO). 2013. Guideline for the Selection of Valued Components and Assessment of Potential Effects. Prepared September 9, 2013. Available at http://www.eao.gov.bc.ca/pdf/EAO_Valued_Components_Guideline_2013_09_09.pdf. Accessed May 2014.

Government of BC. 2012a. Factsheet: Skills training supports liquefied natural gas sector in BC. Available at: http://www.newsroom.gov.bc.ca/ministries/jobs-tourism-and-skills-training/factsheets/factsheet-skills-training-supports-liquefied-natural-gas-sector-in-bc.html. Accessed July 2014.

Government of BC. 2012b. BC Jobs Plan: Skills and Training Plan. Available at: http://www.bcjobsplan.ca/wp-content/uploads/Skills-Training-Plan.pdf. Accessed July 2014.

Government of BC. n.d. BC Jobs Plan: Skills and Training at a glance. Available from: http://www.bcjobsplan.ca/wp-content/uploads/FACTSHEET-Skills-Training-in-BC.pdf. Accessed June 2014.

Grant Thornton. 2013. Employment Impact Review. Prepared for BC Ministry of Energy, Mines and Natural Gas. Available at; http://www.empr.gov.bc.ca/OG/Documents/Grant_Thornton_LNG_Employment_Impacts.pdf. Accessed June 2014.

Human Capital Strategies. 2012. Resource Labour Market Information Report 2012. Prepared for RTO. Available at http://www.rtobc.com/global/pdf/RTO%2BLMI%2BReport%2B2012.pdf. Accessed June 2014.

Human Capital Strategies. 2013. Northern British Columbia's Perfect Storm: Resource labour market Information Report 2013. Prepared for RTO. Available at: http://www.rtobc.com/global/pdf/RTO%2BLabour%2BMarket%2BInformation%2BReport%2B2013.pdf. Accessed June 2014.

Human Resources and Skills Development Canada (HRDC). 2012. Red Seal Program. Available at: http://www.hrsdc.gc.ca/eng/workplaceskills/trades_apprenticeship/red_seal/index.shtml. Accessed: July 2014.

Industry Training Authority (ITA). 2011. CIT Partnership Agreement 2011. Available at: http://www.itabc.ca/sites/default/files/docs/partners/CITO/CITO%20Partnership%20Agreement%2011-12.pdf. Accessed June 2014.

ITA. 2012. Our Trades Training System. Available at: http://www.itabc.ca/overview/our-trades-training-system. Accessed May 2014.

ITA. 2013a. ITA Performance Measures Summary 2012-2013. Available at: http://www.itabc.ca/sites/default/files/ITA_AR12-13_Final.pdf. Accessed July 2014.

ITA. 2013b. Empowering Growth in BC: 2012/2013 Canada-British Columbia labour market Agreement Industry Training Authority Success Report. Available from: http://www.itabc.ca/corporate-reports/labour-market-agreement-report/empowering-growth/. Accessed June 2014.

Ingenia Consulting. 2012. Labour Market Supply Side Environmental Scan – BC's Natural Gas Sector. Prepared for RTO. Available at: Labour Market Supply Side Environmental Scan – BC's Natural Gas Sector. Accessed June 2014.

Kwantlen Polytechnic University (KPU). 2014a. Program Details (Faculty of Trades and Technology). Available at: http://www.kpu.ca/trades/programs. Accessed July 2014.

KPU. 2014b. About Kwantlen Polytechnic University. Available at: http://www.kpu.ca/about. Accessed July 2014.

Labour Force Planning Committee. 2001. Prepared for Growth: Building Alberta's Labour Supply. Available at: Accessed July 2014.

McQuillan, K. 2013. All the workers we need: debunking Canada's labour shortage fallacy. University of Calgary SPP Research Papers Vol. Issue 13. Available at: http://policyschool.ucalgary.ca/sites/default/files/research/mcquillan-labour-shortages-final.pdf. Accessed June 2014.

Ministry of Energy, Mines and Natural Gas. 2014. British Columbia's Liquefied Natural Gas Strategy: One year update. Available at: http://www.gov.bc.ca/com/attachments/LNGreport_update2013_web130207.pdf. Accessed July 2014.

Ministry of Jobs, Tourism and Skills Training. 2014a. A Guide to BC Employment Standards Act. Available at: https://www.labour.gov.bc.ca/esb/esaguide/#10. Accessed June 2014.

Ministry of Jobs, Tourism and Skills Training. 2014b. Provincial Nominee Program BC. http://www.welcomebc.ca/Immigrate/About-the-BC-PNP/About-the-BC-PNP.aspx. Accessed September 2014.

Morrisette, R., Lu, Y., and Qiu, T. 2013. Worker Reallocation in Canada. Social Analysis Division, Statistics Canada. Available at: http://www.statcan.gc.ca/pub/11f0019m/11f0019m2013348-eng.pdfAccessed August 2014.

Office of the Parliamentary Budget Officer. 2014. An Assessment of Canada's labour market Performance. Available at http://www.pbo-dpb.gc.ca/files/files/Labour_Note_EN.pdf. Accessed June 2014.

Premier's LNG Working Group .2014. Final Report to the Premier and Minister of Jobs, Tourism and Skills training and Minister Responsible for Labour Premier's LNG Working Group – March 31, 2014. Available at: http://nwcoastenergynews.com/wp-content/uploads/2014/04/lng_final_report.pdf. Accessed July 2014.

Petroleum Human Resources Council. 2013a. Labour Demand Outlook for BC's Natural Gas Industry. Prepared for the BC Natural Gas Workforce Strategy Committee. Available at: http://cynthiaaasen.com/wp-content/uploads/2013/04/2013-02-21_final_bc_natural_gas_labour_demand_to_2020_report.pdfAccessed June 2014.

Petroleum Human Resources Council. 2013b. The Decade Ahead: labour market Outlook to 2022 for Canada's Oil and natural Gas Industry. Available at: http://www.iecbc.ca/sites/default/files/Enform%20Petroleum%20Labour%20Market%20Information%20canada_labour_market_outlook_to_2022_report_may_2013.pdf. Accessed June 2014.

Petroleum Human Resources Council. 2013c. Oil Sands Labour Market Outlook to 2012. Available at: http://www.petrohrsc.ca/media/19695/final_oil_sands_labour_market_outlook_to_2021_fact_sheet.pdfAccessed June 2014.

Petroleum Human Resources Council, (2013d); BC Natural Gas Workforce Strategy and Action Plan. Prepared for the BC Natural Gas Workforce Strategy Committee. Available at: http://www.rtobc.com/global/pdf/BC%2BNG%2BStrategy%2B2013JUL.pdf. Accessed June 2014.

Resource Training Organization of British Columbia. 2013. Northern British Columbia's Perfect Storm: Resource Labour Market Information Report 2013. Prepared for the Resource Training Organization of B.C. Available at: http://www.rtobc.com/global/pdf/RTO%2BLMI%2BReport%2B2012.pdf. Accessed June 2014.

Shimer, R. 2005. The Cyclicality of Hires, Separations and Job-to-Job Transitions. Federal Reserve Bank of St. Louis Review. July/August 2005: 493-507.

Squamish Nation. 2013. Squamish Nation Trades Centre. Available at: http://www.squamish.net/government/departments/service-delivery/employment-training/squamish-nation-trades-centre/. Accessed August 2014.

Statistics Canada. 2002a. Squamish, British Columbia. 2001 Community Profiles. Released June 27, 2002. Last modified: 2005-11-30. Statistics Canada Catalogue no. 93F0053XIE. http://www12.statcan.ca/english/profil01/CP01/Details/Page.cfm?Lang=E&Geo1=CSD&Code1=5931006&Geo2=PR&Code2=59&Data=Count&SearchText=squamish&SearchType=Begins&SearchPR=59&B1=All&Custom=. Accessed June 2014.

Statistics Canada. 2002b. Whistler, British Columbia. 2001 Community Profiles. Released June 27, 2002. Last modified: 2005-11-30. Statistics Canada Catalogue no. 93F0053XIE. http://www12.statcan.ca/english/profil01/CP01/Details/Page.cfm?Lang=E&Geo1=CSD&Code1=5931020&Geo2=PR&Code2=59&Data=Count&SearchText=whistler&SearchType=Begins&SearchPR=59&B1=All&Custom=. Accessed June 2014.

Statistics Canada. 2002c. Vancouver, British Columbia. 2001 Community Profiles. Released June 27, 2002. Last modified: 2005-11-30. Statistics Canada Catalogue no. 93F0053XIE. http://www12.statcan.ca/english/profil01/CP01/Details/Page.cfm?Lang=E&Geo1=CMA&Code1=933__&Geo2=PR&Code2=59&Data=Count&SearchText=vancouver&SearchType=Begins&SearchPR=59&B1=All&Custom=. Accessed June 2014.

Statistics Canada. 2002d. Squamish-Lillooet D. 2001 Community Profiles. Released June 27, 2002. Last modified: 2005-11-30. Statistics Canada Catalogue no. 93F0053XIE. http://www12.statcan.ca/english/Profil01/CP01/Details/Page.cfm?Lang=E&Geo1=CSD&Code1=5931021&Geo2=PR&Code2=59&Data=Count&SearchText=squamish&SearchType=Begins&SearchPR=01&B1=All&Custom==. Accessed June 2014.

Statistics Canada. 2007a. Squamish, British Columbia (Code5931006) (table). 2006 Community Profiles. 2006 Census. Statistics Canada Catalogue no. 92-591-XWE. Ottawa. Released March 13, 2007. http://www12.statcan.ca/census-recensement/2006/dp-pd/prof/92-591/index.cfm?Lang=E. Accessed June 2014.

Statistics Canada. 2007b. Whistler, British Columbia (Code5931020) (table). 2006 Community Profiles. 2006 Census. Statistics Canada Catalogue no. 92-591-XWE. Ottawa. Released March 13, 2007. http://www12.statcan.ca/census-recensement/2006/dp-pd/prof/92-591/index.cfm?Lang=E. Accessed June 2014.

Statistics Canada. 2007c. Vancouver, British Columbia (Code933) (table). 2006 Community Profiles. 2006 Census. Statistics Canada Catalogue no. 92-591-XWE. Ottawa. Released March 13, 2007. http://www12.statcan.ca/census-recensement/2006/dp-pd/prof/92-591/index.cfm?Lang=E. Accessed June 2014.

Statistics Canada. 2007d. Squamish-Lillooet D (Code5931021) (table). 2006 Community Profiles. 2006 Census. Statistics Canada Catalogue no. 92-591-XWE. Ottawa. Released March 13, 2007. http://www12.statcan.ca/census-recensement/2006/dp-pd/prof/92-594/index.cfm?Lang=E. Accessed June 2014.

Statistics Canada. 2007e. Squamish, British Columbia (Code630446) (table). Aboriginal Population Profile. 2006 Census. Statistics Canada Catalogue no. 92-594-XWE. Ottawa. Released January 15, 2008. http://www12.statcan.ca/census-recensement/2006/dp-pd/prof/92-594/index.cfm?Lang=E. Accessed June 2014.

Statistics Canada. 2013a. Squamish, DM, British Columbia (Code 5931006) (table). National Household Survey (NHS) Profile. 2011 Census. Statistics Canada Catalogue no. 99-004-XWE. Ottawa. Released June 26, 2013. http://www12.statcan.gc.ca/nhs-enm/2011/dp-pd/prof/index.cfm?Lang=E. Accessed June 2014.

Statistics Canada. 2013b. Whistler, DM, British Columbia (Code 5931020) (table). National Household Survey (NHS) Profile. 2011 Census. Statistics Canada Catalogue no. 99-004-XWE. Ottawa. Released June 26, 2013. http://www12.statcan.gc.ca/nhs-enm/2011/dp-pd/prof/index.cfm?Lang=E. Accessed June 2014.

Statistics Canada. 2013c. Vancouver, CMA, British Columbia (Code 933) (table). National Household Survey (NHS) Profile. 2011 Census. Statistics Canada Catalogue no. 99-004-XWE. Ottawa. Released June 26, 2013. http://www12.statcan.gc.ca/nhs-enm/2011/dp-pd/prof/index.cfm?Lang=E. Accessed June 2014.

Statistics Canada. 2013d. British Columbia (Code 59) (table). National Household Survey (NHS) Profile. 2011 Census. Statistics Canada Catalogue no. 99-004-XWE. Ottawa. Released June 26, 2013. http://www12.statcan.gc.ca/nhs-enm/2011/dp-pd/prof/index.cfm?Lang=E. Accessed June 2014.

Statistics Canada. 2013e. Squamish, Indian band area, British Columbia (Code 630555) (table). National Household Survey (NHS) Aboriginal Population Profile. 2011 National Household Survey. Statistics Canada Catalogue no. 99-011-X2011007. Ottawa. Released November 13, 2013. http://www12.statcan.gc.ca/nhs-enm/2011/dp-pd/aprof/index.cfm?Lang=E. Accessed June 2014.

Statistics Canada. 2013f. Table 282-0010 - Labour force survey estimates (LFS), by North American Industry Classification System (NAICS), sex and age group annual (persons x 1,000), CANSIM (database). (Accessed: 2014-07-02) Available at: http://www5.statcan.gc.ca/cansim/pick-choisir?lang=eng&p2=33&id=2820008. Accessed June 2014.

Statistics Canada. 2014. National Household Survey Profile - Squamish-Lillooet name search results. Available at: http://www12.statcan.gc.ca/nhs-enm/2011/dp-pd/prof/search-recherche/frm_res.cfm?Lang=E&SearchText=Squamish-Lillooet&SearchType=Begins&SearchPR=01&TABID=1&Geo1=CD&Code1=5931. Accessed August 2014.

Statistics Canada Industry Accounts Division. 2014. Provincial Input-Output Multipliers, 2010. Catalogue no. 15F0046XDB.

TD Economics. 2013. Jobs in Canada: Where, What and For Whom? Available at: http://www.td.com/document/PDF/economics/special/JobsInCanada.pdf. Accessed June 2014.

The Research Universities' Council of British Columbia. 2013. BC Labour Market Profile. Available at http://www.tupc.bc.ca/pdfs/2013-01-28_850_AM_LMP_Deck.pdf. Accessed June 2014.

University of BC. n.d. Undergraduate Programs and Admissions. Available at: http://you.ubc.ca/programs/. Accessed July 4 2014.

Vancouver Community College. n.d. Program Areas. Available at: http://www.vcc.ca/programscourses/program-areas/. Accessed July 2014.

Whistler Chamber of Commerce. 2014. Personal communication with Whistler Chamber of Commerce and Golder Associates Limited. July 8, 2014.

Woodfibre LNG Limited. 2014. Woodfibre LNG Project Feasibility Study Report. Unpublished internal report. Vancouver BC. 218 pp.

WorkBC. 2011a. British Columbia Trade Occupations Outlook. Available at: http://www.workbc.ca/WorkBC/media/WorkBC/Documents/Docs/BC_tradesoccupationoutlook.pdf Accessed April 2014.

WorkBC. 2011b. British Columbia Labour Market Outlook 2010-2020. Available at: http://www.workbc.ca/WorkBC/media/WorkBC/Documents/Docs/BCLMOutlook.pdf. Accessed April 2014.