Recruiting Petroleum Engineers in Canada, the United States, the United Kingdom and Ireland

Demand for Petroleum Engineers in Calgary

Petroleum Engineers have been identified as a high-demand occupation in Calgary based on the Calgary Labour Demand Forecast 2012.[1] In 2010, there were an estimated 7,400 petroleum engineers in the Calgary labour force. Between 2010 and 2020, demand for these workers is expected to increase by about one third, creating demand for 9,800 workers by 2020. Employers will likely face difficulties recruiting qualified workers for both newly-created jobs and existing positions that become vacant. During the global economic slowdown of 2007-2009, 71 per cent of Calgary's petroleum engineering employers recruited new workers and over half of them (53 per cent) reported experiencing hiring difficulties.[2] The combination of growing demand and limited supply are likely to result in shortages of petroleum engineers in Calgary over the next decade.

In order to meet the growing demand for petroleum engineers, Calgary employers may need to access labour markets outside of Calgary, including international labour markets, to meet a portion of their hiring needs. To facilitate targeted recruiting efforts, Calgary Economic Development (CED) has created this guide to identify the best cities and regions for recruiting workers in Canada, the United States, the United Kingdom and Ireland. Top cities and regions for recruiting are recommended based on the size of the occupational labour force and the likelihood that workers will migrate out of the area.[3]

Top Locations for Recruiting in Canada

Calgary is home to approximately 74 per cent of all petroleum engineers in Canada. The top three recommended cities for Calgary employers to recruit petroleum engineers are St. John's NL, Edmonton, and Toronto. Among the top-recommended cities, Edmonton has the largest labour force, with slightly fewer than 1,000 workers. Outside of St. John's, Edmonton and Toronto, no city has more than about 170 petroleum engineers within the labour force.

An out-migration probability index score is estimated for petroleum engineers in all cities based on analysis of data from Statistics Canada Labour Force Survey. Petroleum engineers in St.

[1] See Calgary Labour Demand Forecast 2012
[2] See Alberta Wage and Salary Survey 2009
[3] An out-migration probability index of workers is estimated based on a set of factors that are indicators of future migration. Factors include historical migration patterns, demographics of the occupational labour force, local economic conditions, median income, and the presence of foreign workers in the labour force.

John's NL have the highest probability of out-migration among all cities. Younger workers have a higher probability of making an inter-provincial move and about 65 per cent of petroleum engineers in St. John's are under age 35. Immigrants and past inter-provincial migrants are more likely to relocate and more than half of the 140 petroleum engineers in Regina are inter-provincial migrants.

Information on average wages of petroleum engineers is limited. According to the Alberta Wage and Salary Survey (2009), petroleum engineers in Edmonton earned average annual base pay of $86,044 per year while petroleum engineers in Calgary had average annual base pay of $122,009. Data from HRSDC's labour market information database reports that wages in Calgary are similar to that of Edmonton (at approximately $45 per hour in 2011) and higher than that of workers in St. John's NL where average hourly base pay was $33.26 per hour in 2009 (latest data available).

See tables 1 and 2 for additional information on the petroleum engineering labour force in Canada.

Table 1 Recruiting Indicators for Petroleum Engineers in Canada, by CMA

Rank	Census Metro Area	Employment (2010)[4]	Average Wage Per Hour	Emigration Probability Index*	Percent of Occupational Labour Force			
					Under Age 35 (2010)	International or Inter-Provincial Migrants (5 Year Period)[5]	Immigrants to Canada 2001-2006	Non-Permanent Residents (2006)
1	St. John's, NL	346	33.26	108	65%	31%	0%	4%
2	Edmonton	908	45.14	103	44%	20%	10%	2%
3	Toronto	253	n.a.	103	37%	20%	17%	0%
4	Vancouver	168	n.a.	103	15%	26%	12%	0%
5	Halifax	82	36.95	104	41%	19%	0%	0%
6	Regina	140	n.a.	102	46%	62%	0%	0%
7	Saint John, NB	44	n.a.	105	67%	0%	0%	0%
8	Ottawa	46	n.a.	103	0%	40%	40%	0%
9	Hamilton	37	n.a.	103	0%	0%	0%	0%
10	Québec	27	n.a.	104	67%	67%	0%	0%
Calgary Region		7,370	45.14	103	31%	19%	8%	2%

*See footnote 3 for additional information about the Emigration Probability Index. Note: Data is measured for Census Metropolitan Areas unless otherwise noted. Figures for Calgary may differ from information presented earlier in this report describing labour demand for the Calgary Economic Region. Sources: Labour Force Survey, 2006 Census of Canada, RDA Global, Labour Market Information - HRSDC WorkingInCanada.gc.ca

[4] Figures for employment in Calgary are for the Calgary Economic Region. Figures for other cities are for the census metropolitan area (CMA)

[5] International and inter-provincial migration statistics are analyzed based on data collected in the 2001 and 2006 Census. The data required to analyze this migration pattern for the most recent 5 year period is not available at the time of this analysis.

Table 2 Wages for Petroleum Engineers in Canada, by CMA

Census Metro Area	Recent Wage Range (CAD) [6]				Provincial Annual Wages or Salary, 2005[7]	
	Low Wage	Average Wage	High Wage	Reference Year	Median	Average
St. John's, NL	24.00	33.26	47.42	2009	106,060	117,275
Edmonton	42.36	45.14	52.56	2011	115,777	158,979
Toronto	n.a.	n.a.	n.a.		93,798	99,589
Vancouver	n.a.	n.a.	n.a.		91,290	103,966
Halifax	28.90	36.95	51.30	2010	n.a.	n.a.
Regina	n.a.	n.a.	n.a.		n.a.	n.a.
Saint John, NB	n.a.	n.a.	n.a.		n.a.	n.a.
Ottawa	n.a.	n.a.	n.a.		93,798	99,589
Hamilton	n.a.	n.a.	n.a.		93,798	99,589
Québec	n.a.	n.a.	n.a.		n.a.	n.a.
Calgary	42.36	45.14	52.56	2011	112,210	122,009

Note: Data is measured for Census Metropolitan Areas unless otherwise noted. *Wage data reflects provincial average.
Sources: 2006 Census, Labour Market Information - HRSDC WorkingInCanada.gc.ca

Top Locations for Recruiting in the United States

In the United States, the occupation most closely aligned with NOC 2145 Petroleum Engineers is: **SOC 17-2171: Petroleum Engineers.**

Salary differences between Calgary and the US may present a challenge for Calgary employers recruiting in the United States. Of the top-recommended cities for recruiting petroleum engineers, only two US cities have average salaries that are lower than the Calgary average of CAD $122,000. They are New Orleans (USD $118,000) and Lafayette, Louisiana (USD $97,000).[8]

The US labour force of petroleum engineers is heavily concentrated in Houston, where about 37 per cent of all petroleum engineers are located. In addition to having a large labour force of petroleum engineers, Houston ranks highly among other recommended US cities in all of the mobility indicators listed in Table 3. Non-US citizens and younger workers have a higher-than-average probability of making a long-distance move and they comprise 20 percent of Houston's petroleum engineering labour force. Houston also has an above-average percentage of workers under age 35 (30 per cent). Mean annual base salaries for petroleum engineers in Houston was approximately USD $135,000 in 2010 and Houston is recommended as a location for recruiting, provided that Calgary employers can meet workers' salary expectations.

[6] Source: HRSDC
[7] Calgary median annual salary is calculated based on average hours worked per week and median hourly wage rate reported in the 2009 Alberta Wage and Salary Survey. The average annual salary is the actual figure from the survey. Annual figures for other cities in Table 2 are from HRSDC.
[8] See Bureau of Labor Statistics Occupational Employment Database 2010 and Alberta Wage and Salary Survey 2009.

Data from the American Community Survey (ACS), which measures past migration patterns for workers in over 400 occupations, reveals that petroleum engineers in Dallas, Denver, Bakersfield CA, and Beaumont-Port Arthur TX have the highest scores on an out-migration probability index. Unemployment is highest in Bakersfield and Beaumont-Port Arthur which had unemployment rates of 13.4 per cent and 10.3 per cent, respectively in September-November 2011. Petroleum engineers are in high demand in the US and typically do not have high unemployment rates, however high unemployment rates in these cities may adversely affect spouses seeking work.

Table 3 Out-Migration Indicators of Petroleum Engineers in Top 10 US Cities, 2010[9]

Rank	Metro Area	Number of Workers	Pct. of Workers who are Non-US Citizens	Mean Age	Pct. Of Workers Under Age 35	Out-Migration Probability Index*	Unemployment Rate
1	Houston-Brazoria, TX	10,380	20%	43	30%	119	7.6
2	Dallas-Fort Worth, TX	1,940	18%	42	44%	122	7.4
3	New Orleans, LA	1,360	15%	44	30%	116	6.5
4	Denver-Boulder, CO	770	5%	45	29%	119	7.9
5	Anchorage, AK	730	n.a.	n.a.	n.a.	116	6.1
6	Tulsa, OK	740	5%	49	14%	113	6.4
7	Bakersfield, CA	350	18%	42	30%	119	13.4
8	San Antonio, TX	300	n.a.	n.a.	n.a.	116	5.7
9	Lafayette, LA	350	n.a.	n.a.	n.a.	114	4.9
10	Beaumont-Port Arthur-Orange, TX	250	n.a.	n.a.	n.a.	116	10.3
United States		**28,210**	**11%**	**44**	**25%**	**117**	**8.2**

*The Out-Migration Probability Index gives an indication of the number of workers in the target occupation in each metropolitan area that have made an interregional move in the past 5 years. The index also reflects factors that may affect worker migration, such as historical migration patterns, demographics of the occupational labour force, local economic conditions, median income, and the presence of foreign workers in the labour force. US Average Out-Migration Probability = 100 (for all US workers in all occupations).

[9] Data on past migration patterns of petroleum engineers are aggregated with data on mining and geological engineers. Employment and income figures are exclusively representative of petroleum engineers.

Table 4 Wages of Petroleum Engineers in Top Ranked Cities for Recruiting in the United States, 2010

Metropolitan Statistical Area	Workers	Mean Hourly Wage** (USD)	Mean Annual Salary** (USD)	Median Salary by Quartile (USD)				
				Lower 10%	Lower 25%	Median	Upper 25%	Upper 10%
Houston-Brazoria, TX	10,380	65.03	135,270	68,700	93,220	123,430	166,210	n.a.
Dallas-Fort Worth, TX	1,940	64.46	134,070	72,240	92,550	120,270	161,170	n.a.
New Orleans, LA	1,360	56.64	117,810	69,290	86,870	105,930	140,800	n.a.
Denver-Boulder, CO	770	63.96	133,050	86,000	108,290	134,320	155,820	n.a.
Anchorage, AK	730	81.64	169,810	91,900	114,960	160,820	n.a.	n.a.
Tulsa, OK	740	65.84	136,940	64,630	87,170	113,840	n.a.	n.a.
Bakersfield, CA	350	60.45	125,740	64,420	82,420	105,530	150,070	n.a.
San Antonio, TX	300	60.89	126,650	67,750	91,460	109,830	157,950	n.a.
Lafayette, LA	350	46.77	97,290	64,190	72,200	87,280	112,620	156,500
Beaumont-Port Arthur-Orange, TX	250	61.50	127,930	69,600	88,590	115,090	156,600	n.a.
United States	**28,210**	**61.53**	**127,970**	**63,480**	**85,930**	**114,080**	**158,580**	**n.a.**
Calgary (in $ CAD)	**7,370**	**$45.14**	**$122,009**	**n.a.**				

**Source for Calgary wage and salary figures is the 2009 Alberta Wage and Salary Survey. Results are updated every 2 years. At the time of this analysis 2011 figures were not yet published. US Data Sources: Bureau of Labour Statistics Occupational Employment Database, American Community Survey, US Census 2010. Analysis by RDA Global.

Top Locations for Recruiting in the United Kingdom and Ireland

In 2010, there were approximately 5,500 petroleum engineers in the UK labour force. Mean annual incomes for petroleum engineers in the UK was £52,000 in 2010,[10] or approximately CAD $87,725. Based on data from the Quarterly British Labour Force Survey, the UK region with the largest number of petroleum engineers is the South East Region which includes a portion of Greater London as well as Brighton, Oxford, Portsmouth, and Southampton.

There are slightly fewer than 500 petroleum engineers in the Irish labour force with average annual earnings of approximately €57,000 (or CAD $78,000). The Irish economy has been strongly affected by the global economic recession that began in 2008 and a lack of employment opportunities in Ireland is pushing some workers to seek work abroad. As of November, 2011, Ireland had one of the highest levels of unemployment in the European Union at 14.6 per cent. Overall out-migration from Ireland is estimated to have reached 76,400 people in the year between April 2010 and April 2011, an increase of 11,100 (or 16.9 per cent) above the 65,300 recorded in the year ended April 2010.[11] There are only two cities in Ireland with a population exceeding 100,000: Dublin and Cork. Recruiting may be performed on a national scale from either market.

[10] Source: Annual Survey of Hours and Earnings, Analysis by RDA Global
[11] See CSO Population and Migration Estimates, April 2011

Table 5 Recruiting Indicators for Petroleum Engineers - UK and Ireland, 2010[12]

Rank	Region/ Country	Major Cities	Number of Workers 2010
1	South East	Brighton, Oxford, Portsmouth, Southampton	1,000
2	North West	Manchester, Liverpool, Preston, Blackpool	700
3	London	Greater London	600
4	Eastern	Greater London, Cambridge, Norwich, Peterborough, Ipswich	500
5	Scotland	Glasgow, Edinburgh, Aberdeen	500
6	South West	Bristol, Bournemouth, Plymouth	500
7	East Midlands	Nottingham-Derby, Leicester, Northampton	400
8	Wales	Cardiff, Swansea	200
9	North East	Sunderland, Newcastle upon Tyne	100
10	Northern Ireland	Belfast	100
Total UK			**5,500**
Total Ireland			**454**
Calgary			**7,370**

Sources: Quarterly British Labour Force Survey, Annual Survey of Hours and Earnings (UK, 2010), Central Statistics Office Ireland (2010), Analysis by RDA Global.

Foreign Credential Recognition

When recruiting engineers in the UK and Ireland, Alberta employers are advised to consult The Association of Professional Engineers, Geologists, and Geophysicists of Alberta (APEGGA) to determine which workers are most likely to meet the requirements for licensure in Alberta.

Information on foreign credential recognition for engineers in the UK and Ireland is available from the Alberta Department of Human Services at:

http://www.albertacanada.com/immigration/working/occupations.aspx.

[12] Sub-national demographic information and wage data could not be identified for this occupation in Ireland.