

**Pengrowth Energy Corporation
Lindbergh SAGD Expansion Project
Socio-Economic Impact Assessment**

Submitted to Pengrowth Energy Corporation

By

**Nichols Applied Management
Management and Economic Consultants
Suite 2401, 10104 – 103 Avenue NW
Edmonton, Alberta T5J 0H8**

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1. Introduction

1.1 Project Description

1.1.1 Overview

Pengrowth Energy Corporation (Pengrowth) currently operates the Lindbergh SAGD Pilot Project, a 1,258 barrel per day (bpd) project located approximately 35 km northeast of the Town of Elk Point, within the St. Paul County No. 19. In Q3 2013, Pengrowth began construction on Phase 1 of the Lindbergh SAGD Project, an expansion designed to increase the productive capacity of the Lindbergh Pilot by 12,500 bpd. Phase 1 is located at the same site as the Pilot.

Pengrowth is proposing a second expansion of the Lindbergh SAGD Project, Phase 2 (the Project) to increase productive capacity by an additional 17,500 bpd to a total of 30,000 bpd. If approved, construction of the Project will take place between late Q4 2015 and late Q1 2017 and will include:

- an expansion of the existing central plant facility (CPF);
- the construction of four well pads and the drilling of an associated 32 well pairs; and
- related infrastructure such as roads and above-ground gathering and distribution pipeline systems.

The Project is anticipated to operate for approximately 25 years following the completion of Phase 2.

The Project will leverage off of Pengrowth's existing and approved operations. The construction and operations workforce will travel to site for shift rotations primarily in personal vehicles and will be housed in an on-site camp. Roughly half of the operations workers are expected to live locally and may commute on a daily basis to their homes in the region.

Initially, bitumen recovered by the Project will be diluted and transported by truck to one of several terminals in the region. Pengrowth anticipates that, by 2023, the Project will be tied in to the larger regional pipeline network and the trucking of bitumen and diluent will cease. Pipeline connectivity is subject to commercial arrangements and regulatory approval and, as such, the precise timing is uncertain.

1.1.2 Summary of Mitigation and Enhancements

The Project has the following characteristics which serve to enhance positive socio-economic effects of the Project, including:

- a local hire program;
- a trapper compensation program; and
- community investment programs.

Certain characteristics of the Project will reduce or eliminate negative socio-economic effects.

- an on-site camp for construction and operations, exclusive to Pengrowth employees and contractors;
- pipelines to deliver diluents to and dilbit from the Project in later years of operations;
- on-site security staff; and
- on-site emergency services staff.

1.2 Scope of the Socio-Economic Impact Assessment

The Socio-Economic Impact Assessment (SEIA) evaluates the impacts of the construction and operations of the Project on the communities in the region. The potential socio-economic impacts of the construction and operation of the Project include economic and fiscal benefits as well as pressures on social systems. The SEIA draws on and refers to ongoing consultation by Pengrowth in the context of the Project and other initiatives.

2. Regulatory Setting

The SEIA addresses the Terms of Reference (TOR) for the Environmental Impact Assessment (EIA) of the Project as issued by Alberta Environment and Sustainable Resource Development (AESRD, 2013).

2.1.1 Key Issues and Questions

The SEIA draws on the following sources for identifying the key socio-economic issues:

- Section 7 of the TOR for the EIA of the Project, as issued by Alberta Environment and Sustainable Resource Development in 2013 (AESRD 2013);
- discussions with regional service providers;
- the responses by the provincial regulator, other stakeholders, and interveners to recent oil sands SEIAs in the course of the regulatory review process, including public hearings;
- socio-economic studies and reports prepared by government, industry or regional service providers; and
- the analysis of recent SEIAs for other oil sands projects.

These sources indicate that the key socio-economic issues to be considered in this analysis fall into the following categories:

- employment effects;
- regional and provincial economic effects, including:
 - personal and business income;
 - government tax and royalty income;
- population effects;
- effects on regional infrastructure and services, including:
 - housing, including worker housing;
 - policing and emergency services;
 - health services;
 - social services;
 - education services;

- recreation activities;
 - municipal infrastructure and services;
 - transportation effects; and
- traditional land use effects.

2.1.2 Key Indicators

The key indicators used to assess the effects of the Project on communities in the study area are:

- workforce;
- income;
- population change;
- effects of population changes on service providers and physical infrastructure;
- effects of increased traffic on the regional road network; and
- traditional land use and culture.

The key indicators used to assess the Project's income and taxation consequences for governments are:

- municipal taxes;
- provincial corporate tax and resource royalty income; and
- federal corporate tax income.

Many of these key indicators are well suited for quantification and provide an easy-to-interpret measure for potential effects. Effects on service providers are based, in part, on key respondent interviews and are treated mostly qualitatively.

2.1.3 Assessment Cases

This analysis defines and relies upon the following development cases or scenarios:

The **Baseline Case**, which consists of the economic activity in the Regional Study Area (RSA) plus those large industrial Projects that are currently under construction or have regulatory approval. The latter captures the following thermal in-situ and cold production heavy oil projects:

- Royal Dutch Shell – Orion Phase 2;
- Husky – Caribou Lake Pilot;
- Cenovus – Foster Creek Phases F, G and H;
- Osum – Taiga;
- Imperial Oil – Nabiye Phases 14-16; and
- Baytex – Gemini.

The **Application Case**, which consists of all the economic activity assumed under the Baseline Case, plus the Project.

The **Planned Development Case (PDC)**, which consists of the economic activity assumed under the Application Case, plus those large industrial Projects that were disclosed as of October 31, 2013, including:

- Canadian Natural Resources – Primrose/Wolf Lake CSS Followup;
- Cenovus – Foster Creek Phase J;
- Devon – Walleye; and
- Birchwood Resources – Sage Pilot.

2.1.4 Study Boundaries

2.1.4.1 Temporal Considerations

The SEIA covers the Project life from construction through to the end of operations. It will concentrate on the time between 2013 and 2018, reflecting that:

- on-site construction of the Project is expected to take place between Q4 2015 and Q1 2017;
- the Project is expected to begin in early Q2 2017.

The 2013-2018 period captures the maximum socio-economic effects of the Project. It will also capture the maximum cumulative effects, noting that all projects included under the PDC are assumed to reach full operations employment in 2018. Other projects may come forward beyond those considered in the PDC. These will be subject to separate applications, including a cumulative effects assessment of industry development as is known at that time.

2.1.4.2 Spatial Considerations

The Regional Study Area (RSA) for the SEIA (Figure 2.1) is comprised of the Municipal District (M.D.) of Bonnyville; the County of St. Paul; and all of the communities within their boundaries including the Elizabeth and Fishing Lake Métis communities as well as reserve lands for the following First Nations:

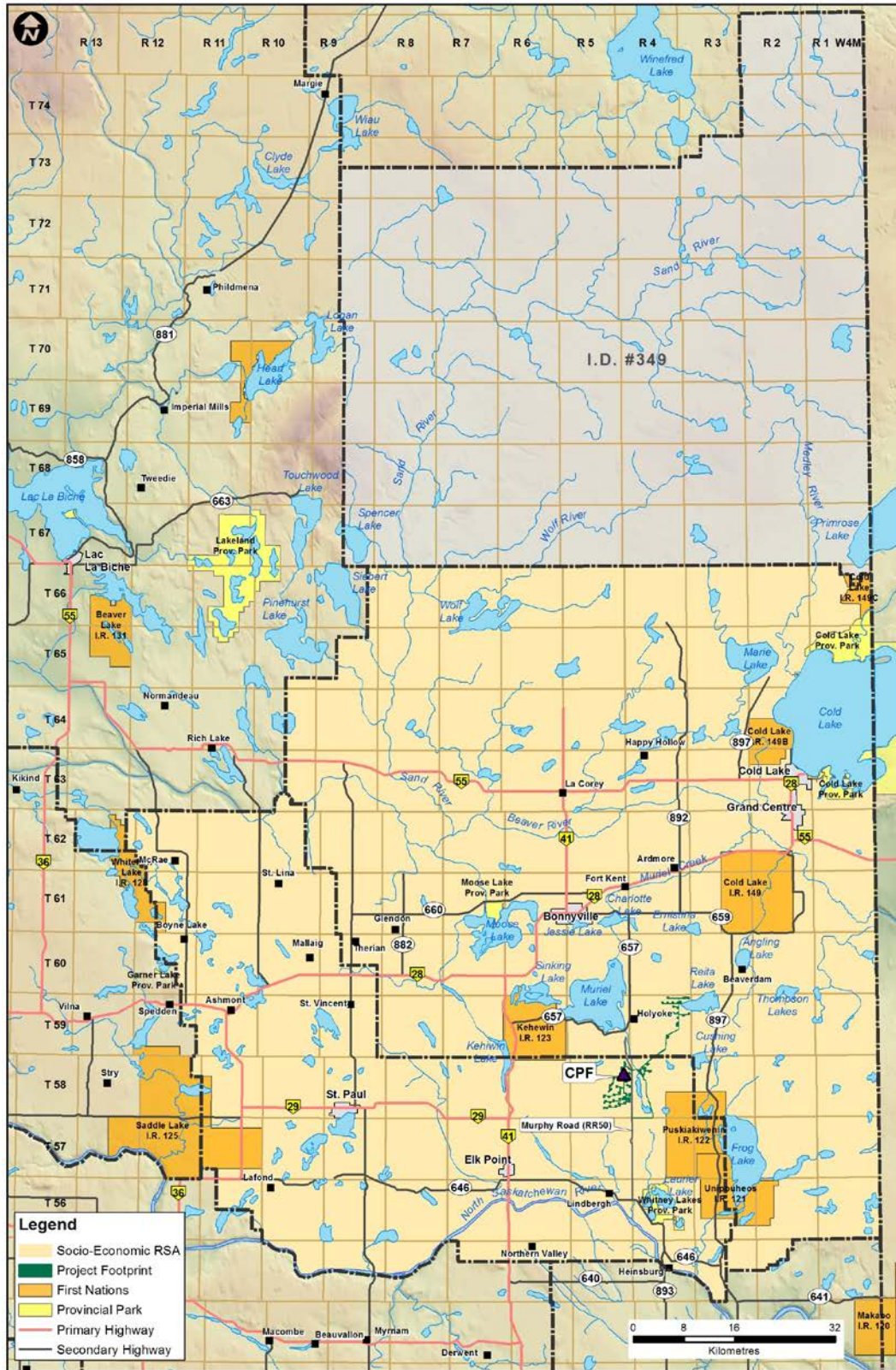
- Cold Lake First Nation;
- Whitefish (Goodfish) Lake First Nation;
- Saddle Lake Cree First Nation;
- Kehewin Cree First Nation;
- Frog Lake First Nation; and
- Onion Lake Cree First Nation.

Recognizing that many Project effects flow to commercial and residential centres, particular attention is paid to the:

- Town of Bonnyville, which has developed as a hub for the oil and gas service industry in the region;
- western portion of the M.D. of Bonnyville, which is the rural area immediately surrounding the Town of Bonnyville that encompasses the transportation network likely used to move people and goods between Bonnyville and the Project;
- Town of St. Paul, which is another service hub in the region with an open housing market and a variety of commercial and government services; and
- Town of Elk Point, a regional transportation hub and residential community in close proximity to the Project.

Where appropriate, the SEIA will consider Project effects beyond the RSA. For example, the SEIA considers the effects of the Project on the Alberta and Canadian economies.

Figure 2.1: Regional Study Area



2.1.5 Analytical Approaches

The differences between the Baseline Case, Application Case, and Planned Development Case are determined using a variety of methods, ranging from extensive quantitative analysis to qualitative approaches, including:

- economic input-output modeling of the Alberta economy to determine the impact of the Project in terms of total employment impacts and the impact on the provincial gross domestic product (GDP) and labour income;
- labour market analysis to relate the construction workforce demands to the availability of workers in light of other anticipated heavy industrial construction in the province;
- population projections to determine the Project impact on regional population growth and on future social infrastructure demands;
- key respondent interviews and analysis of historical performance to gauge the capacity of education, health and other systems to respond to an influx of workers during the construction and operations phases of the Project; and
- data analysis and key respondent interviews with regard to construction and operations-related traffic on the regional road network (Highways 41, 29, 646, 657 and Range Road 50).

The choice of assessment methodology depends on the issue and the availability of data.

3. Economic and Fiscal Effects

3.1 Scope

This section provides an overview of the current economic conditions in the RSA. It also analyzes the economic and fiscal effects of the Project.

3.2 Situation Analysis

3.2.1 Wage Economy

Resource extraction has played a prominent role in the regional economy for a number of years. Historically, agricultural production formed much of the economic base in the RSA, both in the County of St. Paul and in the M.D. of Bonnyville, and movements by agricultural producers away from conventional cattle and grain towards specialized livestock, greenhouses, and niche crops suggests that agriculture will remain a part of the local economy for years to come.

In recent years, the economic driver of the M.D. of Bonnyville has been, and will likely continue to be, the development of heavy oil and oil sands resources. Cold production and thermal in-situ oil sands projects within the M.D. and in I.D. 349 (an adjacent municipality) currently produce an estimated 500,000 bpd, and output is expected to increase to approximately 1,000,000 bpd by 2030 (GOA 2012). The development of oil extraction projects has resulted in the growth of several related industries, including:

- the emergence of roughly 50 oil field service companies focused largely in the Town of Bonnyville; and
- an estimated 60 contractor and sub-contractor firms that are engaged in the construction of the projects and related infrastructure (Beale 2013, pers. comm.).

Historically, the County of St. Paul and the municipalities within its boundaries have been focused on agriculture, particularly beef production, as well as conventional oil and gas activity (Statistics Canada 2006a). In recent years, the region has become increasingly engaged in heavy oil and gas development, oilfield services, and trucking (Bezpalco 2013, pers. comm.). For example:

- there has been growth in small owner-operated oil field service companies based on farms and acreages throughout the county as individuals take advantage of recent changes in local bylaws (Fedoretz 2013, pers. comm.); and

- the town of Elk Point has emerged as a transportation hub and is home to a growing trucking industry, currently consisting of five companies, and the longest airstrip in the region.

3.2.1.1 Labour Force

Educational Attainment

The educational attainment of the workforce in the RSA is generally reflective of the importance of the oil and gas and agricultural industries to the regional economy. For example, the proportion of workers holding a trade or apprenticeship certification in the RSA is 16%, well above the provincial average of 11% (NHS 2011). Although the level of educational attainment within the RSA is above the provincial average for the trades, the population of the region as a whole has a higher proportion (27%) of individuals who have not completed high school as compared to the province overall (19%) (NHS 2011). This figure is significantly higher for the Aboriginal communities within the RSA where more than half (53%) of the population has not completed high school (Statistics Canada 2006)¹.

Unemployment and Participation

The unemployment rate of the labour force in the RSA (4%) is below that of the provincial average of 5.8% (NHS 2011). There is, however, some variation in the unemployment rate across specific communities within the RSA, ranging from a low of 2% in Elk Point to a high of 7% in the Town of St. Paul (NHS 2011). The corresponding rate for the Aboriginal communities in the RSA is 17%, well above the provincial rate (Statistics Canada 2006).²

The participation rate (i.e. the number of people working or looking for work as a percentage of the total population over 15 years of age) in the RSA is 74%, slightly above the provincial average of 73.2%. The Towns of St. Paul and Elk Point are below this average at 67% and 69%, respectively, but all other communities are above the provincial average (NHS 2011). The corresponding rate for the Aboriginal communities in the RSA is 53%, suggesting that roughly half of the Aboriginal population of the RSA is engaged in the wage economy (Statistics Canada 2006).³

¹ Data suppression in the National Household Survey data precludes the calculation of a corresponding number for 2011. The corresponding provincial figure in 2006 was 22%.

² Data suppression in the National Household Survey data precludes the calculation of a corresponding number for 2011. The provincial unemployment rate in 2006 was 4.3%.

³ Data suppression in the National Household Survey data precludes the calculation of a corresponding number for 2011.

3.2.2 Income

Income data for selected communities⁴ within the RSA show:

- a wide range of incomes across communities and family types throughout the RSA;
- income levels below the provincial average for all family types, with the exception of male single-parent families in the Town of Bonnyville and female lone-parent families in the County of St. Paul;
- lone-parent families headed by women tend to earn less than their male counterparts. This distributional irregularity is particularly evident in the Town of Bonnyville where female lone-parent families earn roughly one third of those headed by men; and
- the average income for all family types on the Kehewin Reserve is well below the average level in the RSA and the province overall.

Table 3.1: Family Income by Community

Community	All Families	Couple Families	Male Lone-Parent Families	Female Lone-Parent Families
	Family Income (\$ 2005)			
Town of Bonnyville	\$77,903	\$85,328	\$92,407	\$32,697
M.D. of Bonnyville	\$91,678	\$98,506	\$44,122	\$27,908
Town of St. Paul	\$68,545	\$73,485	-	\$39,586
St. Paul County	\$71,682	\$72,631	\$62,502	\$54,655
Town of Elk Point	\$63,276	\$67,534	-	\$36,590
Kehewin IR	\$30,664	\$38,247	\$20,109	\$18,421
Alberta	\$95,524	\$103,145	\$69,765	\$44,922

Statistics Canada 2006.

As shown in [Table 3.1](#), income inequality tends to affect women more so than men. A high level of income inequality within a community has the potential to reduce social cohesion.

3.3 Income Effects

3.3.1 Construction Expenditures by Region

Total initial capital expenditure for the Project is estimated at \$770 million. Construction capital expenditures include wages and salaries paid to construction workers, professional engineering and environmental services, and the direct purchase of goods

⁴ Income data was not available for all communities. Table 3.1 reflects available data as of October 2013.

and services, such as equipment modules and structural elements. Capital outlays will likely begin before the construction period for items such as engineering and purchases of long lead-time equipment.

Table 3.2 provides a breakdown of the estimated construction expenditure by region, based on published supply ratios by industry, discussions with local service contractors, information provided by Pengrowth, and the past experiences of similar projects in the province (ABFIN 2011). The table indicates that an estimated 48% of the total expenditure will accrue to the RSA and the rest of Alberta. An additional 26% will accrue to the rest of Canada, and the balance to foreign suppliers. The expenditure accruing to foreign suppliers is related primarily to the purchase of machinery and equipment.

Table 3.2: Construction Expenditure by Region

Expenditures	RSA	Other Alberta	Other Canada	Foreign	Total
	[\$ millions]				
Engineering	-	41	12	4	57
Labour	11	142	122	-	275
Materials	3	33	12	27	75
Major Equipment	11	129	53	172	365
Total	25	345	199	203	770
Total [%]	3	45	26	26	100

- Not Significant.

Note: Totals may not add to 100% due to rounding

An estimated \$24 million (or 3%) will accrue to the RSA, primarily in the form of wages paid to local contractors and major equipment purchased during the construction phase of the Project. This estimate is not net of the spending that accrues to contractors who use out-of-region crews.

3.3.2 Sustaining Capital Expenditures by Region

Once operational, the Project will incur costs in the form of ongoing drilling and sustaining capital expenditure. These expenditures include wages and salaries for drilling/completions contractors, as well as ties-ins, well pads, roads, and plant related materials and equipment required to maintain the designed productive capacity of the facility. Sustaining capital and ongoing drilling expenditures will total approximately \$1.1 billion (real \$2013) over the life of the Project, averaging approximately \$44 million (real \$2013) per year. This is in addition to the initial capital expenditure needed to bring the Project on-stream.

Table 3.3 shows a breakdown of the average annual sustaining capital and ongoing drilling costs by region, based on published supply ratios (ABFIN 2011). Approximately 73% of the average annual sustaining capital and ongoing drilling expenditures will accrue to Alberta, including the RSA. Approximately \$5 million of the expenditures in Alberta will accrue to the RSA, primarily as drilling and maintenance wages.

Table 3.3: Annual Sustaining Capital Expenditures by Region

Expenditures	RSA	Other Alberta	Other Canada	Foreign	Total
	[\$ millions] per year				
Labour	3	2	-	-	5
Materials & Equipment	2	25	3	9	39
Total	5	27	3	9	44
Total [%]	12	61	7	20	100

- Not Significant.

Note: Totals may not add to 100% due to rounding

3.3.3 Operations Expenditures by Region

Once fully constructed, the annual operations expenditure of the Project, including fuel and utilities, will total \$1.5 billion (\$60 million per year, real \$2013). These costs are in addition to the sustaining capital and ongoing drilling expenditures of approximately \$1.1 billion (\$44 million per year, real \$2013).

Table 3.4 provides a breakdown, by region, of the annual operations expenditure based on the published supply ratios by industry (ABFIN 2011). An estimated 73% of the expenditures will accrue to Alberta, including the RSA, and an additional 10% to the rest of Canada.

Table 3.4: Annual Operations Expenditures by Region

Expenditures	RSA	Other Alberta	Other Canada	Foreign	Total
	[\$ millions] per year				
Labour	3	3	-	-	6
Materials & Equipment	3	35	6	10	54
Total	6	38	6	10	60
Total [%]	10	63	10	17	100

- Not Significant.

Note: Totals may not add to 100% due to rounding

An estimated \$3 million of the operations expenditure is expected to accrue to local area workers and contractors. Some of the contractor spending is likely to accrue to out-of-region workers in the early years of operations in view of the relatively small size of the RSA labour force. These estimates may change over time as the workforce in the region develops.

3.3.4 Local Hire and Procurement

Pengrowth has policies in place to hire locally first and to use local contractors where feasible. The Town of Bonnyville has emerged as a service centre for oil sands development in the region, particularly those developments in the northern portion of the M.D. of Bonnyville and I.D. 349. As such, there is contractor capacity in the region that can be engaged by Pengrowth to carry out selected drilling and maintenance activities.

As described in [Section 9](#) of this report, there are a number of First Nations in the RSA, many of whom are actively engaged in the oil and gas sector. To date, Pengrowth has engaged a number of First Nations contractors to carry out work related to earthworks, including road and plant site construction, timber salvage, brush clearing, fencing construction, culvert installation, and other general labour tasks during the construction and operations of the Pilot Project and Phase 1.

Pengrowth has policies in place to work with members of the local community, with a focus on Aboriginals, to receive the training required for long-term operations related employment at the Lindbergh site.

3.4 Total Income Effects

3.4.1 Construction

The construction expenditures associated with the Project will constitute income for contractors, suppliers, and workers. These primary recipients will, in turn, spend a portion of this income on goods and services, thus circulating the expenditures throughout the economy, compounding the income effect of the Project.

Based on published statistics, the Project's direct, indirect and induced impact in terms of Gross Domestic Product (GDP), and household income is approximately \$600 million and \$300 million respectively (ABFIN 2011).

3.4.2 Operations and Sustaining Capital

The total (direct, indirect and induced) GDP impact of operating, ongoing drilling, and sustaining capital expenditures are estimated at \$90 million. The total labour income effect of the Project's operating, sustaining capital, and ongoing drilling expenditures is estimated at \$40 million. The estimates represent averaged annual impact over the life of the Project and are based on published multipliers (ABFIN 2011).

3.5 Fiscal Effects

The Project contributes property taxes to the affected municipalities and oil sands royalties to the provincial government. Project tax and royalty payments expand the ability of the different levels of government to fund programs and initiatives in the RSA and elsewhere.

3.5.1 Municipal Fiscal Effects

The location of the central plant and the initial well-pairs, and the timing of on-going drilling is such that municipal taxes will be paid:

- to the County of St. Paul over the full operational life of the Project; and
- to the M.D. of Bonnyville during the final years of operations as on-going drilling activity will cross from the County of St. Paul into the M.D.

This analysis is focused on the Project's more immediate fiscal impact on the County of St. Paul, which is expected to begin in 2017 and continue over the 25 year operational life of the Project. The Project's fiscal impact will be incremental to the anticipated effects of Phase 1 which is currently under construction and will also be contributing municipal taxes to the County of St. Paul.

The financial position of the County of St. Paul, the host municipality to the Project, can be characterized as follows:

- a non-residential assessment base that is low relative to other rural municipalities in Alberta;
- municipal tax rates that are above those in similar rural Alberta municipalities; and
- current debt levels which are lower than the provincial average of all municipalities and also lower than the average rural municipality.

The total assessment base of the County is approximately \$1.2 billion, with non-residential structures, linear property, and machinery and equipment accounting for 47% of the assessment, and residences accounting for 48% (AMA 2013). Once fully built, the Project is estimated to increase the total non-residential assessment base (including linear, co-generating machinery and equipment, and general machinery and equipment) by approximately \$200 million, or 39%.

The amount of municipal taxes that the Project will pay is uncertain, as both the actual assessment of the facility and the tax rates in effect when it becomes operational are unknown. A preliminary estimate of the Project's municipal tax payment during 2017, its first full year of operations, is \$3.8 million. This estimate assumes the prevailing municipal tax rates remain in effect. In reality, setting municipal tax rates is the prerogative of the municipal government and generally tax rates for different property classes are set based on the gap between required revenue to fund operating and capital budgets and other sources of funding, such as grants, fees, and licenses.

The municipal tax payments are expected to be an order-of-magnitude higher than the municipal costs, making the Project a net contributor to the municipal fiscal health of the County.⁵

3.5.2 Provincial Fiscal Effects

3.5.2.1 Royalties

Once fully operational, the Project will pay royalties to the provincial government. Future royalty payments are subject to uncertainty as they are directly related to the prevailing market price of oil, the Canadian-US dollar exchange rate, and the differential between light and heavy crude oil. Production costs, including fuel, also impact the calculation of royalties.

For this analysis, it is assumed that:

- the Project is a single, fully integrated (ring fenced) entity;
- the discount rate is 8%;
- the long-term price of WTI is USD \$85; and
- the 2008 Alberta government royalty framework is in effect for the life of the Project.

Under these assumptions, the Project is expected to pay, on average, \$58 million (real \$2013) in royalties per year. Over the 25 year operational life, royalty payments are expected to have a net present value (NPV) of \$400 million.

These provincial fiscal benefits are not net of potential costs to the province of social and physical infrastructure investment driven by oil sands industry expansion, including the Project. The Cold Lake Oil Sands Area (CLOSA) Comprehensive Regional Infrastructure Sustainability Plan (CRISP) outlines the requirement of provincially funded infrastructure in the Cold Lake Oil Sands area as bitumen production increases. These costs notwithstanding, oil sands are a net contributor to the fiscal position of Alberta. Total bitumen royalties paid to the Provincial Government of Alberta in 2011/12 were roughly \$4.5 billion and are forecast to be approximately \$3.4 billion in 2012/13 (GOA 2013.). Approximately 15% (\$760 million in 2011/12) of these bitumen royalties are paid by projects in the CLOSA – the area in which the Project is located.

⁵ Project demands on municipal infrastructure and services are addressed in [Section 6](#).

3.5.2.2 Corporate Taxes

Unlike royalties, which are paid on a project basis, corporate taxes apply to company-wide earnings and are sensitive to the overall financial situation of the Project owner. Pengrowth Energy Corp. is a firm with a number of holdings and accumulated tax credits. These credits are expected to reduce the actual tax payments to zero over the life of the Project.

3.6 Employment Effects

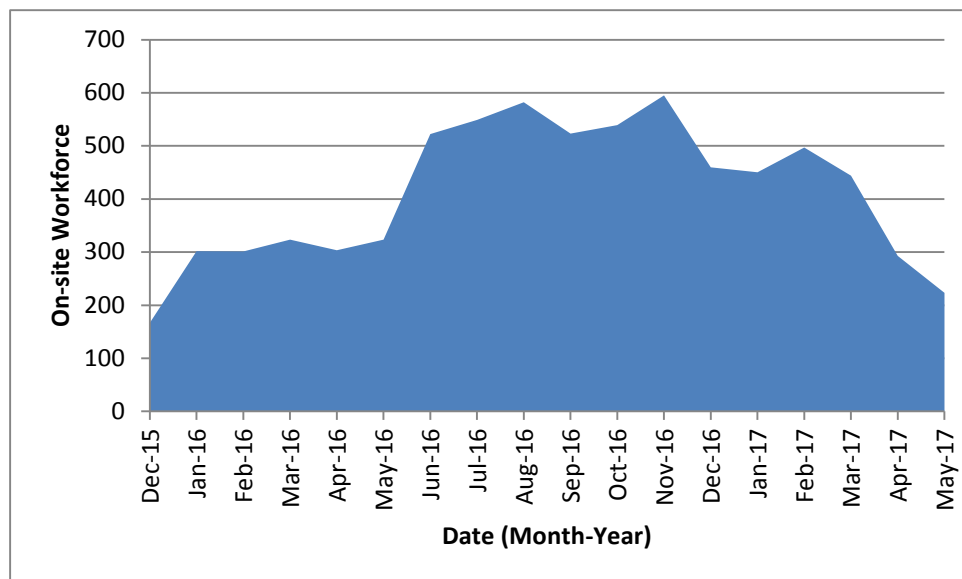
3.6.1 On-Site Construction Employment

Construction of the Project is expected to require 1,050 person years of labour during the 2015 to 2017 period, of which approximately 540 are expected to be on-site, with the balance in construction yards and fabrication shops outside the RSA.

In addition to the 540 person years for the construction of the on-site facilities, there will be initial drilling and completions activity which is expected to generate an additional 75 person years of on-site employment between 2015 and 2017.

All together and under the assumed schedule, the construction of the plants, field facilities, and the drilling of wells will create close to 615 person years of on-site employment over the 18 month construction period (including site preparation and commissioning), with a peak of nearly 600 in late 2016, as shown in Figure 3.1.

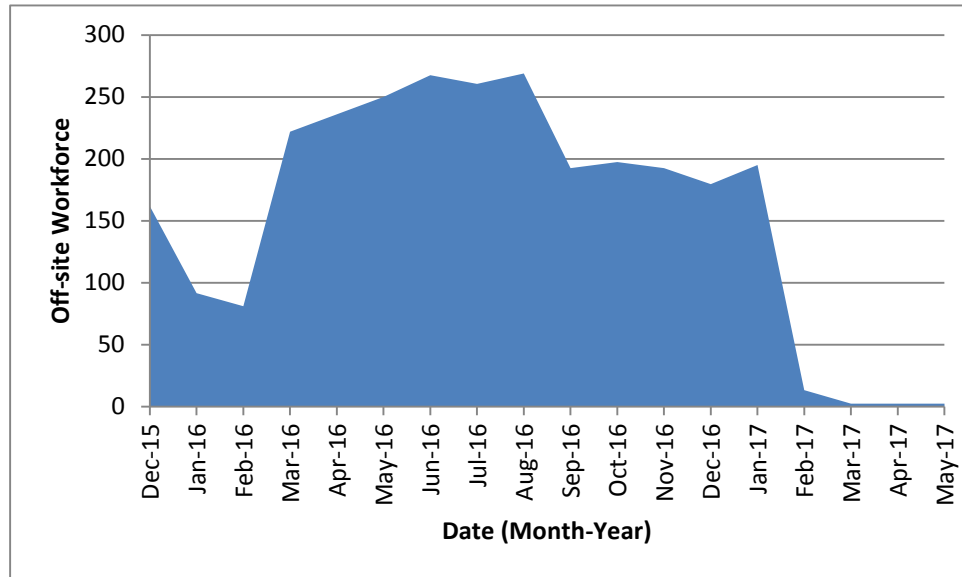
Figure 3.1: On-Site Construction Workforce



3.6.2 Off-Site Construction Employment

The construction of the Project will create work in fabrication shops and construction yards outside of the RSA, mostly in the Edmonton area. The total off-site construction is estimated to be 435 person years during the 2015 to 2017 period. Figure 3.2 shows that the off-site workforce is expected to peak at approximately 270 workers during the summer of 2016 given the assumed construction schedule.

Figure 3.2: Off-Site Construction Workforce



3.6.3 Construction Employment by Type

The Project will employ a broad range of construction trades during the on-site plant, well pad, and pipeline construction activities, the bulk of which will be welders, pipe fitters, and iron workers. The Project will also create significant work for general labourers.

Table 3.5 provides an approximate breakdown of the construction trades represented in the on-site construction workforce.

Table 3.5: On-Site Construction Workers by Occupation

Category	Total [%]
Labourer	33
Welder	10
Concrete finisher	8
Iron worker	10
Pipe fitter	15
Heavy equipment operator	4
Electrician	8
Instrument tech	4
Insulator	8
Total	100

As noted, there will be initial drilling activities during the construction period. The skills required for this work include the full range of rig workers, including roughnecks, motormen and drillers. Off-site workers, employed in fabrication yards, will include metal fabricators, pipe fitters and welders.

3.6.4 Engineering Employment

In addition to on- and off-site construction employment, the Project is expected to create an estimated 190 person years of employment for engineering contractors. The majority of this work will accrue to engineering firms outside of the RSA in Edmonton and Calgary.

3.6.5 On-Site Operations Employment

Once the Project is fully operational, it is expected to employ 37 people, including contractors. All but two of these full-time positions are expected to be Pengrowth employees with the balance staffed by contractors.

During the operations, there will be continuous drilling activities to ensure that productive capacity is maintained throughout the life of the Project. This ongoing drilling activity and associated field construction is expected to employ approximately 25 person years of labour annually on-site. This estimate is an annual average as the actual volume of drilling will vary from year to year. There are contractors within the RSA who have the ability to perform some of this type of work. [Table 3.6](#) provides an approximate breakdown of the operations workforce by type represented in the on-site workforce.

Table 3.6: Operations Workers by Type

Category	Total
Operators and maintenance workers	23
Technical and supervisory staff	8
Administrative positions	4
Maintenance contractors	2
Total	37

In addition to the permanent operations employment, the Project will employ between 100 and 225 contractors for approximately three weeks every two years for scheduled turnarounds.

3.6.6 Off-Site Operations Employment

Some of the activities related to the operation of the Project will be performed off-site. For example, well pad equipment will be fabricated in production facilities in the greater Edmonton area. This employment is expected to average between 5 and 10 person years of employment annually over the life of the Project.

3.6.7 Total Employment Effects

The economic activity associated with the Project will stimulate employment with suppliers to the Project and in the general economy as the affected workers spend their income on goods and services, hence creating employment in consumer goods and services sectors. The employment effect of the Project on suppliers is referred to as indirect employment effects and the employment generation effect in the general economy as induced employment effects. An order-of-magnitude estimate of these indirect and induced employment effects using published multipliers derived from an Input-Output model of the Alberta economy (ABFIN 2011) is as follows:

- the total direct employment effect of the construction phase of the Project, including the on- and off-site workforces and engineering is estimated at 1,240 person years; and
- the total direct, indirect and induced employment effect is estimated at 2,320 person years over the construction period.

The total direct employment effect of the operations phase includes the regular operations work force, the ongoing maintenance work force and ongoing drilling activities. As noted above, the total estimated direct operations employment effect of the Project is approximately 61 full-time equivalent positions. The total direct, indirect and induced employment is estimated to be approximately 245 person years annually.

4. Population

4.1 Scope

This section presents the population effects associated with the Project on the RSA. As indicated in [Section 2.1.4](#), the focus is on the Towns of St. Paul, Elk Point and Bonnyville as well as the M.D. of Bonnyville and the County of St. Paul.

4.2 Situation Analysis

4.2.1 Resident Population

In 2011, the RSA was home to nearly 36,200 people distributed throughout the Towns of Bonnyville, St. Paul and Elk Point, the M.D. of Bonnyville, County of St. Paul, and several First Nations and Métis communities (Statistics Canada 2011). The closest population centre to the Project (35 km) is the Town of Elk Point, which was home to 1,412 people in 2011. Other urban service centres in close proximity to the Project include the Town of St. Paul (55 km) and the Town of Bonnyville (38 km), with populations of 5,400 and 6,216 residents respectively ([Table 4.1](#)).

Table 4.1: Historic RSA Population Growth

Geography	2001	2011	Average Annual Growth Rate (%)
Town of Bonnyville	5,709	6,216	0.9
M.D. of Bonnyville*	8,858	10,587	1.8
Town of St. Paul	5,061	5,400	0.7
County of St. Paul	6,140	5,831	-0.5
Town of Elk Point	1,445	1,412	-0.2
Cold Lake First Nation I.R. 149/149B	588	788	3.0
Kehewin I.R. 123	991	1,065	0.7
Puskiakiwenin I.R. 122	432	484	1.1
Saddle Lake I.R. 125	1,175	1,302	1.0
Whitefish I.R. 128	1,175	1,188	0.1
Unipouheos I.R. 121	586	813	3.3
Elizabeth Métis Settlement	596	654	0.9
Fishing Lake Métis Settlement	478	436	-0.9
RSA Total	33,234	36,176	0.9
Alberta	2,974,807	3,645,257	2.1

*Includes the Village of Glendon

In the ten-year period between 2001 and 2011, the permanent population of the RSA increased at an average annual growth rate of 0.9%, below the provincial rate of 2.1% for that same period. This growth was not uniform across the RSA, for example:

- the Unipouheos First Nation and the Cold Lake First Nation grew at a rate of approximately 3.3% and 3 % respectively, well above the regional and provincial averages;
- the largest urban centres of the Town of St. Paul and the Town of Bonnyville grew at 0.7% and 0.9% respectively, roughly in line with the region overall but below the provincial average;
- the County of St. Paul, Town of Elk Point and Fishing Lake Métis Settlement experienced population declines at a rate of 0.5%, 0.2%, and 0.9% respectively; and
- the M.D. of Bonnyville experienced a growth of 1.8% per year over the ten-year period due in part to the continued development of residential sub-divisions in the Moose Lake, Riverhurst, and Cherry Grove areas (Poole 2013, pers. comm.).

Population estimates for the smaller communities within the RSA should be interpreted with caution as growth rates of communities with small total populations can be heavily influenced by a small absolute change in the number of residents.

4.2.2 Non-Resident Population

In addition to the permanent population residents within the RSA, there are a number of mobile workers living in camps and motels throughout the region. The mobile worker population varies over time due to the seasonal nature of oil and gas projects, pipeline and related infrastructure projects as well as the phased nature of large scale industrial construction.

Hotels and motels in the Towns of Bonnyville, St. Paul and Elk Point rely on regular business from industrial work crews. Interviews with town officials in each community indicate an occupancy rate of over 90% for hotels and motels, and consequently there are sustained efforts by the towns to attract more temporary lodging development. Officials at the County of St. Paul and M.D. of Bonnyville have reported that regional campgrounds are used to house temporary workers, and the towns are reporting an increase in unofficial room rentals from local homeowners as well as applications for secondary suites. In the County of St. Paul, nine temporary camps have been established during 2013, primarily to house temporary pipeline workers, and an open camp near Bonnyville is reported to be at capacity (Fedoretz; Power; Poole 2013, pers. comm.).

The non-resident population of the County of St. Paul and the Towns of St. Paul and Elk Point is estimated to be 1,100 workers, or approximately 10% of the permanent population, and fluctuates seasonally.

4.3 Population Effects

Any estimate of the future population of the RSA is subject to uncertainty and is linked to the future industrial development scenarios (including oil sands), the workforce housing model employed, and the availability of housing and services in the RSA.

The current industry operating model employed in the RSA is to use mobile workers to construct and operate plants and house them, in large part, in on-site worker accommodations. In general terms, operations and construction camps serve to:

- reduce the population effect of industrial development on the RSA by reducing the number of workers with spouses and family members in the region; and
- reduce the population growth-related effects on local services and infrastructure.

4.3.1 Baseline Case

Based on industry's growth plans in late 2013, the resident population in the RSA is expected to grow by approximately 1.3% annually, reaching 39,408 by 2018, an increase of 2,470 people. The expected population growth by municipality is shown in [Table 4.2](#).

Table 4.2: Baseline Case RSA Population Growth

Geography	2013	2018	Average Annual Growth Rate (%)
Town of Bonnyville	6,325	6,755	1.3
M.D. of Bonnyville*	10,970	12,300	2.3
Town of St. Paul	5,470	5,650	0.6
County of St. Paul	5,831	5,831	0.0
Town of Elk Point	1,412	1,412	0.0
Cold Lake First Nation I.R. 149/149B	835	965	2.9
Kehewin I.R. 123	1,080	1,120	0.7
Puskiakiwenin I.R. 122	495	525	1.2
Saddle Lake I.R. 125	1,330	1,400	1.0
Whitefish I.R. 128	1,190	1,195	0.1
Unipouheos I.R. 121	870	1,020	3.2
Elizabeth Métis Settlement	680	740	1.7
Fishing Lake Métis Settlement	450	490	1.7
RSA Total	36,938	39,408	1.3

*Includes the Village of Glendon

The precise allocation of future population across communities within the RSA is subject to a number of factors, including the availability and price of housing. This is particularly relevant when considering population growth in Aboriginal communities, where the supply of housing is not determined entirely by market forces. There is currently a housing price differential across RSA communities, particularly between the two largest urban centers – the Towns of Bonnyville and St. Paul. Home prices in the former average

\$334,939 whereas house prices in the latter average \$228,211 (AREA 2013). These price differences as well as the proximity of particular communities to future industrial development will affect the settlement patterns of workers who re-locate to the region.

It is worth noting that the historic decline in the populations of the County of St. Paul and the Town of Elk Point are expected to be offset by increased economic activity in the area. Officials in both communities anticipate future growth and report an increase in planned housing developments (Fedoretz 2013; Goyan 2013, pers. comm.).

4.3.2 Application Case

As with Phase 1, Pengrowth will construct and operate the Project on a remote camp basis. Past experience suggests that the majority of construction workers will be housed on-site and approximately 50% of its operations staff will live in camp, with the balance living in urban or rural residential communities throughout the RSA.

Given the existing labour market in the region and the low unemployment rate, a sizeable portion of both the direct operations jobs and the indirect and induced jobs will be filled by in-migrants. Resident population growth associated with the Project will begin accruing to the RSA communities in early 2017 prior to the beginning of operations.

Under the Application Case assumptions and taking into account the camp-based model, the local hire policies, the current distribution of workers from Phase 1 and the current labour market conditions, the permanent population effect of the Project is expected to be 61 people. The population increase will be distributed primarily across the Towns of St. Paul, Bonnyville and Elk Point as well as the residential communities within the M.D. of Bonnyville and the County of St. Paul as shown in [Table 4.3](#). Since housing in Aboriginal communities is limited to members and not subject to general market forces, it is assumed that the Project's effect on the reserves and Métis settlements will be limited.

Table 4.3: Application Case RSA Population Growth

Geography	2013	2018	Project Effect	Average Annual Growth Rate (%)
Town of Bonnyville	6,325	6,761	6	1.3
M.D. of Bonnyville*	10,970	12,313	13	2.3
Town of St. Paul	5,470	5,669	19	0.7
County of St. Paul	5,831	5,848	17	0.1
Town of Elk Point	1,412	1,418	6	0.1
Cold Lake First Nation I.R. 149/149B	835	965	-	2.9
Kehewin I.R. 123	1,080	1,120	-	0.7
Puskiakiwenin I.R. 122	495	525	-	1.2
Saddle Lake I.R. 125	1,330	1,400	-	1.0
Whitefish I.R. 128	1,190	1,195	-	0.1
Unipouheos I.R. 121	870	1,020	-	3.2
Elizabeth Métis Settlement	680	740	-	1.7
Fishing Lake Métis Settlement	450	490	-	1.7
RSA Total	36,938	39,464	61	1.3

*Includes the Village of Glendon

The levels of growth forecast in the Application Case are below the 2% annual growth level currently being planned for by the Towns of Bonnyville and St. Paul, and roughly in line with the 2.5% annual growth being planned for by the M.D. of Bonnyville (MDB 2007; TOB 2005; TOSP 2010). The level of growth in the Aboriginal communities may be higher than shown in [Table 4.3](#) if members currently living off reserve or settlement elect to return to the reserve, subject to the availability of housing.

4.3.3 Planned Development Case

Under the PDC assumptions, the population is expected to increase by 423 people above the Application Case during the by 2018 period. The anticipated distribution of future population growth is shown in [Table 4.4](#). Since housing on the reserves and settlements is limited to members and not subject to general market forces, it is assumed that future growth in the PDC will not have a permanent population effect on these communities. Growth in these communities is reflected in the Baseline Case estimates.

Table 4.4: PDC Case RSA Population Growth

Geography	2013	2018	PDC Effect Above Application Case	Average Annual Growth Rate (%)
Town of Bonnyville	6,325	6,907	146	1.8
M.D. of Bonnyville*	10,970	12,590	277	2.8
Town of St. Paul	5,470	5,669		0.7
County of St. Paul	5,831	5,848		0.1
Town of Elk Point	1,412	1,418		0.1
Cold Lake First Nation I.R. 149/149B	835	965		2.9
Kehewin I.R. 123	1,080	1,120		0.7
Puskiakiwenin I.R. 122	495	525		1.2
Saddle Lake I.R. 125	1,330	1,400		1.0
Whitefish I.R. 128	1,190	1,195		0.1
Unipouheos I.R. 121	870	1,020		3.2
Elizabeth Métis Settlement	680	740		1.7
Fishing Lake Métis Settlement	450	490		1.7
RSA Total	36,938	39,887	423	1.5

*Includes the Village of Glendon, Elizabeth Métis Settlement and Fishing Lake Métis Settlement

All of the growth in the PDC incremental to the Application case is expected to accrue to the Town and M.D. of Bonnyville due to the physical location of the projects included in the PDC. The levels of growth forecast under the PDC are within the 2% annual level of growth currently being planned for by the Towns of Bonnyville and St. Paul and slightly above the 2.5% annual growth being planned for by the M.D. of Bonnyville (MDB 2007; TOB 2005; TOSP 2010). Communities in the RSA may experience population growth rates that differ from those presented in [Table 4.4](#) as individuals react to changes in the availability and affordability of housing throughout the region.

5. Housing

5.1 Scope

This section discusses the housing effect associated with the Baseline Case, Application Case, and the PDC on the RSA.

5.2 Situation Analysis

The RSA has a well-developed housing stock, estimated to be 12,778 private dwellings in 2011, an increase of 743 (6%) dwellings since 2006 (Statistics Canada 2006, 2011). The housing stock has increased at an average annual rate of 1.1% in the region in the past five years, roughly on par with the 0.9% average growth rate of the population (Statistics Canada 2011, 2006). Compared to the provincial average, the RSA shows slightly higher ownership tenure than the province as a whole (80% versus 73%) and a similar level of housing density (Statistics Canada 2011, 2006).

5.2.1 Accommodation for Current Pengrowth Workforce

Approximately half of the current operations workforce, including trades and supervisory staff, associated with the Pilot Project is resident throughout the RSA. Pengrowth houses the balance of the operations staff as well as the majority of the workers associated with the construction of Phase 1 in on-site camps.

5.2.2 Supply of Housing

5.2.2.1 Town of Bonnyville

Approximately 18% of the residential units within the RSA are located in the Town of Bonnyville (Statistics Canada 2011). The Town has seen an increase of approximately 0.5% (11 units) per year since 2006 up to 2,324 in 2011, a rate of increase which is below the population growth of 0.9% annually noted in [Section 4.2](#).

The Town of Bonnyville has the largest proportion of apartments relative to all dwelling types (18%) of all municipalities in the RSA, the balance being mainly semi- and single-detached houses and row houses (Statistics Canada 2006). Approximately 35% of all dwellings are rented whereas 65% are owned. This is a higher rental rate than the RSA average of approximately 18% and provincial average of approximately 25%.

The Town of Bonnyville has sufficient land to develop housing for three to four thousand additional residents; however, a shortage of available home building trades in the region limits the rate at which new houses can be brought on-line. Currently, there are

100 lots under construction and an 80 unit apartment building is planned in a new subdivision for 2015 (Power 2013, pers. comm.).

5.2.2.2 M.D. of Bonnyville

The M.D. of Bonnyville contains approximately 30% of all residential units in the RSA (Statistics Canada 2011). The M.D. had 3,820 dwellings in 2011, an average increase of 2.5% (63 units) per year since 2006, above the rate of population growth (1.8%) for the same period (Statistics Canada 2011, 2006). Much of that growth has taken place in the residential sub-divisions of Moose Lake, Riverhurst, and Cherry Grove (Poole 2013, pers. comm.). The M.D. does not contain any high-density housing units and an estimated 220 units (5%) are available for rent.

The M.D. has a sizeable portion of land available for residential development and is able to accommodate additional housing construction at a pace of 90 to 100 new units per year (Poole 2013, pers. comm.).

5.2.2.3 Town of St. Paul

The Town of St. Paul has 17% of the residential units in the RSA (Statistics Canada 2011). The Town saw 206 units added between 2006 and 2011, bringing its housing stock to 2,169. Approximately 27% of all dwellings are rented while the rest are owned, a proportion on par with the provincial average of approximately 25%. The Town of St. Paul has three parcels of partially serviced land that may be released for residential development. If released, these lands could accommodate roughly 65 residential lots (Laidley 2013, pers. comm.) The town has also recently focused its efforts on attracting the development of temporary housing such as motels, hotels and other short-term rentals (Boisvert 2013, pers. comm.).

5.2.2.4 The County of St. Paul

The County of St. Paul has 17% of the residential units in the RSA (Statistics Canada 2011). The County experienced limited housing development between 2006 and 2011. Over this period, nine units were added bringing the current housing stock up to 2,207. The new units were mainly homes in the lake communities of the County (Fedoretz 2013, pers. comm.). The County has land available for residential development and has recently sub-divided 28 lots in Mallaig.

5.2.2.5 Town of Elk Point

The Town of Elk Point is home to 4% of the residential units in the RSA (Statistics Canada 2011). The Town saw 12 units added between 2006 and 2011, bringing its housing stock to 572 units. Approximately 26% of all dwellings are rented.

There is currently a housing shortage in the Town of Elk Point. Discussions with municipal officials indicate that that workers currently employed in the Elk Point area are commuting from the Towns of St. Paul and Bonnyville due to a lack of homes for sale and rent in Elk Point (Goyan 2013, pers. comm.).

The Town is encouraging residential development in response to this housing shortage, and several multi-family units, including an eightplex and three fourplexes, are currently being developed. The Town has 50 more lots available for development however, town officials report difficulties in attracting developers to the area.

5.2.2.6 Aboriginal Communities

Housing on First Nations reserves is managed by the Band and Aboriginal Affairs and Northern Development Canada (AANDC), and is not generally subject to market forces that would otherwise affect the supply of housing in the community.

Factors that affect the availability of housing on reserve include:

- the cost of housing, especially for people not or only partially engaged in the wage economy; and
- federal government policies and funding for on-reserve housing; and
- revenues generated by the Band through engagement in the broader wage economic activities.

The supply of housing on Métis settlements is driven largely by the ability of the settlements to fund the construction of additional units. The eight Métis Settlements in Alberta recently signed a long-term arrangement with the Provincial government that includes support for a housing program based on the (CAPS) Habitat for Humanity model. This program may trigger a \$15 million investment in housing across all participating settlements.

5.2.3 Price of Housing

In 2012/2013, the average home price in each of the three municipalities within the RSA for which data are available was below the provincial average of \$381,308 (Table 5.1). However, the rental cost in the Town of Bonnyville is above the provincial average.

Table 5.1: RSA Housing Market Statistics

Geography	Average Home Price 2013	Average Monthly Rent* 2013	Rental Vacancy Rate (%) 2012
Town of Bonnyville	\$334,939	\$1,121	6.8
M.D. of Bonnyville*	**\$274,057	n/a	n/a
Town of St. Paul	\$228,211	\$787	4.1
County of St. Paul	n/a	n/a	n/a
Town of Elk Point	\$220,264	\$810	0.0
Alberta	\$381,308	\$1,085	1.5

*(2 bedroom apartment)

** 2012 statistic

Source: CMHC 2013, CMHC 2012, AREA 2013, AMA 2013, REAL 2013.

5.2.4 Affordability

There is a reported shortage of both affordable and senior's housing units in all of the municipalities within the RSA (Poole 2013; Power 2013; Fedoretz 2013; Goyan 2013; Boisvert 2013, pers. comm.). The Town of Bonnyville is planning to commission a study on increasing affordable and senior's housing in the region and the Town of Elk Point has created a sub-division for mobile homes while all other communities are encouraging affordable housing development but lack any specific plans to address the issue.

5.2.5 Mobile Worker Accommodation

Local officials indicate that mobile workers in the region reside in temporary work camps, RV parks, campgrounds and hotels and motels. The supply of temporary worker accommodations in the County of St. Paul (including the Towns of St. Paul and Elk Point) is approximately 1,500 sites, rooms and beds. A breakdown of these accommodations by type can be seen in [Table 5.2](#).

Table 5.2: Mobile Worker Accommodation

Accommodation Type	Capacity
Work Camps (# beds)	700
Work Camps (# RV sites)	140
Campgrounds/RV Parks (# sites)	400
Hotels/Motels (# of rooms)	260
Total	1,500

5.3 Housing Effects

The need for housing is driven by population growth. The housing effects presented here assume the previously described use of work camp accommodations by Pengrowth and the use of hotels and motels by other operators in the RSA, which is in line with the current practice. As outlined in [Section 5.2.2.6](#), the availability of housing in Aboriginal communities is not generally subject to conventional market forces that would

otherwise affect the supply of housing. As such, housing effects under the three assessment cases are focused on the Town of Bonnyville, the M.D. of Bonnyville, the Town of St. Paul, the County of St. Paul and the Town of Elk Point.

5.3.1 Baseline Case

The housing needed to accommodate Baseline Case population growth in the RSA is estimated at 700 units (140/year) for the period between 2013 and 2018. The distribution of new housing units throughout the RSA is shown in [Table 5.3](#).

Table 5.3: Baseline Case Housing Requirements

Geography	2011 Housing Units	Average Units Built per year (2006-2011)	Average Units Needed per year (2013-2018)
Town of Bonnyville	2,324	11	35
M.D. of Bonnyville	3,820	63	90
Town of St. Paul	2,169	41	15
County of St. Paul	2,207	2	-
Town of Elk Point	572	2	-
RSA Total	11,092	119	140

The expected demand for housing under the Baseline Case assumption is higher than the previous rate of growth in supply for the RSA as a whole. The recent rate of growth in the housing stock in the M.D. and the Town of Bonnyville will not be sufficient to meet the demand for housing in the Baseline Case. However, discussions with municipal officials indicate that the pace of residential development is increasing in the Town of Bonnyville and the M.D. of Bonnyville is capable of bringing up to 100 units of housing on-line per year if necessary (Poole 2013; Power 2013, pers. comm.). They also indicate that sufficient land is available to meet the demand for new housing under the Baseline Case (Poole 2013; Power 2013, pers. comm.).

5.3.2 Application Case

The permanent housing need associated with the long-term population effect of the Project is estimated to be approximately 25 units by 2018. Including the growth in the Baseline Case, demand is estimated at approximately 730 units (146/year) by 2018. The anticipated distribution of new housing units throughout the RSA is shown in [Table 5.4](#).

Table 5.4: Application Case Housing Requirements

Geography	2011 Housing Units	Average Units Built per year (2006-2011)	Average Units Needed per year (2013-2018)
Town of Bonnyville	2,324	11	35
M.D. of Bonnyville	3,820	63	95
Town of St. Paul	2,169	41	15
County of St. Paul	2,207	2	1
Town of Elk Point	572	2	-
RSA Total	11,092	119	146

The expected demand for housing under the Application Case assumptions is higher than the previous rate of growth in supply for the RSA as a whole. Similarly to the Baseline Case, the recent rate of growth in the housing stock in the M.D. and the Town of Bonnyville will not be sufficient to meet the demand for housing in the Application Case. However, discussions with municipal officials indicate that the pace of residential development is increasing in the Town of Bonnyville and the M.D. of Bonnyville is capable of bringing up to 100 units of housing on-line per year (Poole 2013; Power 2013, pers. comm.). They also indicate that sufficient land is available to meet the demand for new housing under the Application Case (Poole 2013; Power 2013, pers. comm.).

The historic rates of growth in the housing markets of the County and Town of St. Paul will likely be sufficient to provide the additional units needed in the Application case. The town of Elk Point has land available for development but the supply of housing will depend largely on the ability of the municipality to attract residential contractors. As described in [Section 5.2.2.5](#), the Town of Elk Point is also actively encouraging residential development.

5.3.3 Planned Development Case

The permanent population forecast for the PDC is estimated to generate housing demand for 885 units (177/year), by 2018 (155 units above the Application Case). The anticipated distribution of new housing units throughout the RSA is shown in [Table 5.5](#).

Table 5.5: PDC Housing Requirements

Geography	2011 Housing Units	Average Units Built per year (2006 -2011)	Average Units Needed per year (2013-2018)
Town of Bonnyville	2,324	11	45
M.D. of Bonnyville	3,820	63	110
Town of St. Paul	2,169	41	20
County of St. Paul	2,207	2	1
Town of Elk Point	572	2	1
RSA Total	11,092	119	177

The additional housing demand in the PDC that is incremental to the Application case is expected to accrue to the Town and M.D. of Bonnyville due to the physical location of the projects included in the PDC. As indicated in [Section 5.2.2](#), both municipalities have land available for development and will need to engage developers in the near term to allow for the timely construction of the housing units necessary to accommodate the growth forecast under PDC assumptions.

5.4 Mitigation and Management Measures

Pengrowth has existing operations in the RSA and is aware of the existing housing conditions throughout the region. Pengrowth recognizes that:

- the size of the workforce needed for the construction and operation of the Project cannot likely be fully supplied by the local labour force; and
- job creation in the region may lead to in-migration and the associated demand for temporary and/or permanent housing.

With a view to these realities, Pengrowth has adopted construction and operations strategies that make use of on-site camps to house both construction and a portion of operations workers. Housing workers in on-site camps will minimize the direct Project effects on the demand for housing, both temporary and permanent, in the RSA.

6. Municipal Infrastructure

6.1 Scope

This section discusses the existing municipal infrastructure in the RSA as well as the effects associated with the Baseline Case, Application Case, and PDC. The funding of municipal infrastructure is also addressed.

6.2 Situation Analysis

6.2.1 Existing Infrastructure

Each of the municipalities within the RSA is responsible for the planning, construction, operations, and maintenance of municipal infrastructure within its boundaries. The demand for certain municipal infrastructure and services in the Towns of Bonnyville, St. Paul and Elk Point is driven not only by their respective residents, but also by the needs of individuals living nearby.

The Towns of St. Paul and Bonnyville offer a range of well-developed municipal infrastructure to residents of the RSA. With respect to the future capacity of the existing municipal infrastructure in the RSA, discussions with municipal representatives indicate that:

- wastewater treatment capacity varies throughout the RSA:
 - the County of St. Paul's sewage lagoon is at capacity;
 - Elk Point is expanding its sewage lagoon to accommodate three times the current population;
 - the M.D. of Bonnyville's sewage lagoons have some capacity but are limited to residential use and do not take large, commercial sewage; and
 - the Towns of St. Paul and Bonnyville both have sewage capacity to accommodate population well beyond current levels (Fedoretz 2013, pers. comm.; Goyan 2013; Boisvert 2013; Poole 2013; Power 2013, pers. comm.).
- the water treatment plant in the Town of St. Paul can process water for up to 10,000 residents, well above the current population levels. A water line from the treatment plant is also being put in to service the Town of Elk Point (Fedoretz 2013; Boisvert 2013, pers. comm.);

- The water treatment facility in the Town of Bonnyville is under strain because the input water from Moose Lake is of low quality and requires substantial treatment in order to be made safe for human consumption. A Government of Alberta study has identified the need for a regional water system between Town of Bonnyville, M.D. of Bonnyville, Cold Lake and Cold Lake First Nation (CLFN). A waterline from the City of Cold Lake to the Town of Bonnyville is expected to be built over the next several years (Power 2013, pers. comm.).
- Many residents of the M.D. of Bonnyville are connected to water and wastewater systems. Some residents have water delivered, others have local wells and some have wastewater trucked out. Major service points for water hauling in the M.D. are reservoirs in the hamlets of Ardmore and Fort Kent. The availability of potable water is becoming an issue and the M.D. is limiting commercial use of potable water from reservoirs (Poole 2013, pers. comm.).
- There are six transfer stations throughout the County of St. Paul, including in the towns of St. Paul and Elk Point. Waste is transferred to the county's Evergreen Regional Landfill which has capacity to accommodate sizeable future growth (Fedoretz 2013, pers. comm.).
- The M.D. and Town of Bonnyville haul solid waste from local transfer stations to landfills located near the Village of Ryley in Beaver County and, on occasion, to the hamlet of Lafond in St. Paul County (Poole 2013; Power 2013, pers. comm.).

Municipalities in the RSA also offer recreation and social services to residents of the RSA. These services, along with fire protection services for which municipalities are responsible, are discussed in [Section 7.3](#).

6.2.2 Funding of Municipal Infrastructure

Generally speaking, municipal governments are responsible for costs associated with the construction and maintenance of infrastructure such as water and sewer systems. As shown in [Table 6.1](#), many of the municipalities in the RSA show signs of healthy financial positions. Specifically, they have:

- per capita assessments near or above the provincial average for similar municipalities, with the exception of the County of St. Paul and the Town of Elk Point;
- per capita debt levels below the provincial average for municipalities of their type, with the exception of the Town of Bonnyville; and
- total municipal debt levels that are less than:
 - 1% of the allowable limit in the County of St. Paul;
 - 24% of the allowable limit in the Town of St. Paul;
 - 7% of the allowable limit in the Town of Elk Point;
 - 48% of the allowable limit in the Town of Bonnyville; and
 - 3% of the allowable limit in the M.D. of Bonnyville.

Table 6.1: 2011 Municipal Financial Indicators

Community	Per Capita Debt	Average Per Capita Debt for Municipality Type	Per Capita Assessment	Average Per Capita Assessment for Municipality Type
County of St. Paul	\$50	\$754	\$213,725	\$398,723
Town of St. Paul	\$656	\$1,052	\$105,478	\$110,346
Town of Elk Point	\$191	\$1,052	\$81,025	\$110,346
M.D. of Bonnyville	\$220	\$754	\$469,313	\$378,723
Town of Bonnyville	\$1,560	\$1,052	\$127,703	\$110,346

Source: AMA 2013.

There are a number of revenue sharing agreements in place between RSA municipalities. Agreements are in place between the M.D. of Bonnyville, the Town of Bonnyville, and the City of Cold Lake under which a portion of the M.D.'s revenues are shared with the two urban centres to offset the cost of service delivery to M.D. residents. A similar agreement is in place between the County and Town of St. Paul. This agreement covers services provided to County residents by the Town's Culture, Parks and Recreation Department.

The M.D. of Bonnyville is also party to an agreement with the provincial government which allows for the transfer of non-residential tax revenue from I.D. #349 to the M.D. amounting to roughly \$1 million annually for the next 4 years.

6.3 Municipal Infrastructure Effects

6.3.1 Baseline Case

The Baseline Case population growth rates for RSA municipalities, ranging between 0% to 2.3%, fall within the growth rates being used for municipal planning purposes (SP 2010, TOB 2005, MDB 2007). Even so, some municipal infrastructure and services outlined in [Section 6.2](#) – such as the water treatment facility in the Town of Bonnyville – is either reaching or at capacity. Plans for addressing these capacity issues will need to be developed and carried out in a timely manner in order to meet future growth demands.

6.3.2 Application Case

The additional population growth and hence municipal infrastructure requirements under the Application Case are marginal. The municipal infrastructure currently in place and planned is expected to be sufficient to service the anticipated Project-related population effect of approximately 60 people.

The Project itself and the associated on-site camp will not be tied directly into the water and sewer system of the County. It will, however, purchase potable water from the County and haul out sewage to the Bonnyville and Cold Lake Municipal lagoons. Pengrowth may apply for a drinking water well license from Alberta Environment and Sustainable Resource Development and, if developed, this well may offset the amount of potable water purchased from the County.

Along with a marginal demand on municipal services, the Project will add to the County of St. Paul's assessment base and pay municipal property taxes ([Section 3.5.1](#)).

6.3.3 Planned Development Case

Population effects under PDC assumptions are estimated to be 488 new residents in the RSA above Baseline Case estimates in 2018. For most RSA municipalities, the PDC population growth rate falls within the growth rate being used for municipal planning purposes, with the exception of the M.D. of Bonnyville where the growth rate is slightly above (2.8%) the upper range of 2.5% being used by the municipality. The municipal infrastructure currently in place combined with planned upgrades and expansions might not be sufficient to service the anticipated population under the PDC assumptions and therefore development plans should be monitored and plans adjusted as required in order to ensure full services should the PDC materialize.

With respect to future infrastructure needs, the provincial government has developed a Comprehensive Regional Infrastructure Sustainability Plan (CRISP) for the Cold Lake Oil Sands Area (CLOSA) – a larger region that includes the RSA (GOA 2012). The CLOSA CRISP links oil sands industry expansion to population growth and requirements for provincially funded infrastructure, including water and wastewater facilities. Among the near-term (2014) implementation actions identified in the CLOSA CRISP are:

- build on existing work, complete a more detailed feasibility study on the recommended Cold Lake regional waterline;
- encourage continued regional co-operation between municipalities by supporting municipalities in the development and implementation of inter-municipal agreements and regional services when requested; and
- integrate short-term infrastructure priorities, including existing capacity gaps and state-of-good repair needs for existing infrastructure into the Government of Alberta Capital Plan and Budget.

6.4 Mitigation and Management Measures

Pengrowth is committed to communicating regularly with municipalities in the region to keep them informed of its development plans so that affected municipalities can make informed decisions regarding any potential Project-related changes in the demand for services.

7. Social Infrastructure

7.1 Scope

All residents of the region rely on social infrastructure as a means of maintaining and improving quality of life. Social infrastructure includes a diverse range of human services and infrastructure, including health, education, social, recreation, policing and emergency services.

These facilities and services are important to the community as a means of:

- supporting the functioning of the community by sustaining the well-being of its residents and building social cohesion; and
- sustaining economic growth by making the community more attractive to those considering investing in, or relocating to, the region.

The Project will have an effect on social infrastructure in the RSA primarily via its population effect. This section discusses those effects and provides order-of-magnitude estimates of select social infrastructure effects under the Baseline, Application and Planned Development Case scenarios.

7.2 Situation Analysis

7.2.1 Policing

Policing in the region is provided by the Royal Canadian Mounted Police (RCMP) via the:

- St. Paul detachment, which is responsible for policing the Town of St. Paul, part of the County of St. Paul, Saddle Lake Reserve and Goodfish Lake Reserve. The detachment is staffed by 31 officers, including six Aboriginal policing positions (Trottier 2013, pers. comm.);
- Elk Point detachment, which is responsible for policing the Town of Elk Point and part of the County of St. Paul. The detachment is entirely funded by the province. Information on the number of officers is not publicly available (Casey 2013, pers. comm.); and
- Bonnyville detachment, which is responsible for policing the Town of Bonnyville, as well as the western portion of the M.D. of Bonnyville including the La Corey road (Range Road 60) and the Village of Glendon. The detachment is staffed by 18 officers (Gandalfi 2013, pers. comm.).

Based on data from Statistics Canada, crime rates in the RSA (criminal code offences per 1,000 population)⁶:

- range from approximately 100 in the area surrounding Bonnyville to 350 in St. Paul;
- are above the provincial crime rate of 85;
- with the exception of St. Paul (350), are largely in line with crime rates for other comparable communities in Alberta (ranging from 80 to 300); and
- since 2009, have dropped in the St. Paul area, increased slightly in the Bonnyville area and increased considerably in the Elk Point area (approx. 40%) (StatsCan 2013).

Interview respondents from detachments in the RSA also note the following (Casey, Trottier, Gandalfi, pers. comm. 2013):

- increased traffic, including heavy truck traffic, and traffic-related issues, such as dangerous driving and traffic-related offences and accidents, particularly on Hwy. 646 but also on Hwy. 41 and 897; and,
- increased thefts from remote industrial sites, particularly those serviced by the Elk Point and Bonnyville detachments.

7.2.2 Emergency Services

Ambulance service provision falls under the responsibility of Alberta Health Services (AHS), which contracts providers throughout the province. Within the RSA, ambulance services providers include:

- St. Paul and District Ambulance Service, which provides coverage to the County and Town of St. Paul and provides backup coverage to the Town of Elk Point and other nearby municipalities. The service, which is owned by the Town and County of St. Paul and operated by St. Therese Hospital, operates four ambulances using 16 full-time and 20 casual staff (Brodziak 2013a, pers. comm.).
- The Bonnyville Municipal Ambulance (BMA) service, which provides coverage to the Town of Bonnyville and much of the southwest portion of the MD of Bonnyville, including the communities of Glendon, Iron River, La Corey, and Ardmore. The BMA service operates three ambulances using 19 full-time and 21 casual staff and handles approximately 950 calls per year. According to a BMA

⁶ Four-year average (2009-2012).

representative, the service runs at capacity or is short of capacity about 45-50% of the time and has seen a significant increase in traffic-related calls in recent years as a result of increased oilfield-related activity (Stone 2013, pers. comm., BAS 2013).

- Prairie EMS, which provides coverage to the Town of Elk Point and further south along Hwy 646, in the Lindbergh area. There is one ambulance with advanced life support in Elk Point that is staffed by two paramedic/EMT crews. The company has additional resources that can be moved between locations to fill vacancies, when necessary (Cauchy 2013, pers. comm.).

Fire protection services are located in towns throughout the RSA, providing coverage to the surrounding rural areas (Table 7.1). Fire stations in the RSA are largely volunteer led (i.e. chiefs), supported by part-time (volunteer or paid on-call) firefighting forces. The two largest and best-equipped fire stations are located in the Towns of St. Paul and Bonnyville. Both fire stations handle, on average, 170 calls per year (SPFD 2013, BRFA2013a). The fire station in Elk Point handles approximately 150 calls per year. These call volumes have been largely consistent over time and fall within the capacity of the fire stations. In addition to municipal fire services, many Aboriginal communities in the RSA also have their own volunteer fire departments (KFN 2013c, FLFN 2013a, FLMS 2013, CLFN 2013a, WLFN 2013c).

Table 7.1: Fire Protection Services

Fire Department	Station Location	Personnel	Equipment
St. Paul Fire Department	St. Paul	36 members	<ul style="list-style-type: none"> • Rescue van equipment with Jaws of Life • 2 pumpers • 1 water truck
Ashmont Fire Department	Ashmont	15 members	<ul style="list-style-type: none"> • 1 pumper truck • 1 equipment van
Mallaig Fire Department	Mallaig	25 members	<ul style="list-style-type: none"> • 1 pumper truck • 1 rescue van • 1 water truck
Elk Point Fire Department	Elk Point	23 members	<ul style="list-style-type: none"> • 2 pumper trucks • 1 rescue van • 1 boat for water rescue
Bonnyville Regional Fire Authority	Bonnyville	6 full-time staff 9 part-time/ casual staff approximately 160 volunteers	<ul style="list-style-type: none"> • 1 rapid response unit • 4 pumper trucks • 1 water truck • Aerial Foam Unit • Specialized equipment for industrial firefighting, vehicle extrication, wildland firefighting, hazardous material response and high angle rescue
	Glendon		<ul style="list-style-type: none"> • 1 pumper truck • 1 tanker truck • 1 rapid response vehicle • Village of Glendon Fire truck
	Fort Kent		<ul style="list-style-type: none"> • 1 pumper truck
	Ardmore		<ul style="list-style-type: none"> • 1 pumper truck
	Iron River		<ul style="list-style-type: none"> • 1 rapid response unit • 1 tanker truck
	La Corey		<ul style="list-style-type: none"> • 1 pumper truck • 2 tanker trucks
	Goodridge		<ul style="list-style-type: none"> • 1 pumper truck • 1 tanker truck • 1 rescue/support vehicle

Source: BRFA 2013b, COSP 2013a.

The Bonnyville Regional Fire Authority has mutual aid protection agreements with the County of St. Paul, as well as with Aboriginal communities, such as the Cold Lake First Nations, Kehewin Cree Nation, and Elizabeth Métis Settlement. In addition, the Authority provides industrial fire protection services under contract to Imperial Oil Resources and Canadian Natural Resources Ltd. Via this agreement, the Authority receives funding from industry for apparatus and equipment upgrading (BRFA 2013c).

The Bonnyville Regional Fire Authority is adequately staffed and prepared for population growth and plans to add staff in order to maintain the current ratio of firefighters to citizens as the population grows (Welecki 2012, pers. comm.).

The St. Paul Fire Department is also adequately staffed and, as of late 2013, has excess capacity. Future staffing or capacity issues are not being anticipated. The Department

has mutual aid agreements with the County of Smoky Lake, the County of Two Hills and the Bonnyville Regional Fire Authority. No current industrial protection service agreements exist with companies in the area (Kotowicz 2013, pers. comm.).

7.2.3 Health Services

Alberta Health Services (North Zone) has primary responsibility for the delivery of many provincially funded health services in the study area. Health centres in the RSA include:

- St. Therese - St. Paul Healthcare Centre: a facility with 30 acute-care beds that provides 24-hour emergency, pharmacy, laboratory and X-Ray services to residents of the Town and County of St. Paul. The Centre currently operates at approximately 80%+ capacity and is staffed by a general surgeon, nine general practitioners and three specialists (Blanchette 2013, pers. comm.);
- Elk Point Healthcare Centre: a fully integrated facility with 12 acute-care beds that provides acute care, continuing care and community health services to residents of the Town of Elk Point and surrounding area; and
- Bonnyville Health Centre: a facility with 33 acute-care beds that offers 24-hour emergency, acute and long-term care, palliative care to residents of the Town and M.D. of Bonnyville. The Centre has expansion plans, including increasing the number of acute-care beds to 43, increasing the number of stretcher bays from four to 12, and building four operating suites. The Centre currently operates at approximately 70% to 75% capacity and employs 20 General Practitioners, three anesthesiologists, one internist, one orthopedic surgeon and 15 visiting specialists (Smyl 2013, pers. comm.).

Some communities in the RSA are also home to medical clinics and family physician offices that provide access to physician and other primary care services. Many of these clinics and physician offices are also part of either the Bonnyville or Lakeland Primary Care Networks (PCNs). PCNs connect local family physicians with other health professionals in order to better coordinate delivery of, and improve access to, primary health services for their patients.

Issues with respect to the provision of health services in the RSA include (Smyl 2012, Blanchette 2013, pers. comm.):

- difficulty in recruiting and retaining health care professionals and support staff;
- space constraints and aging infrastructure in health centres in the region;
- occasional reduction of emergency room hours, from 24-hours to daytime hours only, during periods of physician shortages; and

- difficulty in ensuring access to a level of health services that is comparable to other parts of the province.

Despite these issues, which are similar to issues in other rural settings in Alberta, emergency departments in the assessment area consistently perform well. For the past three years (2010/11 to 2012/13), emergency departments in the region discharged 95% of patients within the targeted timeframe (less than 4 hours). This is well above the provincial average, which approximately 80%, and above the average for suburban/rural hospitals (91%) (AHS 2012, 2013).

Along with the health services identified above, there are also services available in Aboriginal communities in the RSA including:

- Kehewin Health Centre, which provides members of the Kehewin First Nation with access to health professionals (e.g. nurse, dental hygienist, dietician) as well as health programs and services (e.g. maternal child health program, home care program) (KFN 2013a);
- Cold Lake First Nation Health Centre, which provides members of the CLFN with access to a number of health services including primary care (e.g. home care, bi-weekly doctor/dental hygienist clinic), chronic disease management (e.g. diabetes initiative), and children and youth programs (e.g. Aboriginal Headstart, maternal health) (CLFN 2013b);
- Saddle Lake Health and Wellness Centre, which provides Saddle Lake Cree First Nation members with access to a medical clinic, pharmacy, home care, public health and wellness programs (SLCN 2013a);
- Whitefish (Goodfish) Lake Health program, which is responsible for delivering and promoting community health services, such as prenatal care, counselling services, and home care for members of the Whitefish Lake First Nation (WLFN 2013a);
- health services at Frog Lake, including the Morning Sky Health and Wellness Centre and Frog Lake Counselling Services (National Native Alcohol and Drug Abuse Program) (FLFN 2013b); and
- access to nursing services at the Elizabeth and Fishing Lake Métis Settlements (EMS 2013, FLMS 2013).

7.2.4 Education

Primary and secondary education in the RSA is provided by several school boards, including:

- the St. Paul Education Regional Division No. 1. The Division operates nine school sites in the County of St. Paul; in the communities of Ashmont (2), Elk Point (3), Heinsburg (2), Myrnam (1), Mallaig (1) and the Hairy Hill Hutterite Colony (1). There are a further six school sites in St. Paul, including the St. Paul Storefront Campus, offering schooling to youth not attending or succeeding in the regular system, and the St. Paul Alternate Education Centre, a virtual school that serves Grades 7-12 students on a full-time, part-time or off-site basis (SPEP 2012);
- the Northern Lights School Division No. 69. The Division operates four school sites in the Town of Bonnyville, including the Bonnyville Outreach School which operates as a recovery program for students who have otherwise been unsuccessful in the school system. There are three more school sites in the M.D. of Bonnyville, in the communities of Iron River, Glendon, and Ardmore;
- the Lakeland Catholic School District No. 150. The District operates three schools in the Town of Bonnyville, which covers preschool to grade 12, and all offer French Immersion to students; and
- the East Central Francophone Education Region No. 3 School System operates one school each in the Towns of Bonnyville and St. Paul.

According to Accountability Pillar Survey results from Alberta Education, between 85% and 87% of teachers, parents, and students surveyed in 2012 were satisfied with the overall quality of basic education in the St. Paul, Northern Lights, and Lakeland school systems. This is comparable to the provincial average of 89% (SPEP 2012, NLSO 2012, LLSO 2012).

[Table 7.2](#) provides Accountability Pillar Survey results for students in the region as compared to the provincial average. The results show that:

- high school completion rates and post-secondary transition rates for all students in the St. Paul and Northern Lights school divisions are below the provincial average;
- high school completion rates and post-secondary transition rates for all students in the Lakeland school division are above the provincial average; and
- high school completion rates and post-secondary transition rates for Aboriginal students are above the provincial average in all three school divisions.

Table 7.2 provides results based on a three-year average. While high school completion and post-secondary transitions have largely been maintained over this three year period, rates for Aboriginal students in the St. Paul school division have been declining.

Table 7.2: Accountability Pillar Survey Results (3 Year Average)

Measure		St. Paul ERD ¹	Northern Lights SD ²	Lakeland RCSSD ³	Provincial Average
All Students	High School Completion Rate (3 year)	67.3	63.8	77.6	71.6
	Post-Secondary Transition Rate (6 year)	55.6	57.2	63.7	59.5
FNMI Students ⁴	FNMI High School Completion Rate (3 year)	40.6	45.5	51.9	36.0
	FNMI Post-Secondary Transition Rate (6 year)	43.7	47.3	64.2	32.3

Sources: SPEP 2012, NLSD 2012, LLSLSD 2012.

Notes:

1) St. Paul Education Regional Division No. 1.

2) Northern Lights School Division No. 69.

3) Lakeland Roman Catholic Separate School District No. 150.

4) FNMI = First Nation, Métis and Inuit.

School division officials report the following trends and challenges (Brodziak 2013, pers. comm.):

- an overall decline in enrolment, particularly in rural areas;
- fluctuating student populations in some schools servicing large First Nations populations; and
- an increase in students with diverse cultural backgrounds as a result of immigration.

Along with the public and separate school divisions noted above, a number of Aboriginal communities in the region also have education offerings, including:

- the Frog Lake Chief Napeweaw Comprehensive School, a Kindergarten to Grade 12 School (FLFN 2013c);
- the Pakan Elementary and Junior High School at Goodfish Lake (WLFN 2013b);
- the Onchaminahos School and Kihew Asiniy Education Centre which together offers classes from K-12 at Saddle Lake (SLCN 2013b);
- the Kehewin Community Education Centre, which offers K-12, as well as a Cree Language and Cultural Program (KFN 2013b);

- the LeGoff School, which offers classes from K-9 for the CLFN (CLFN 2013c);
- the Elizabeth Métis Settlement School which offers programs from Early Childhood Services (ECS) to Grade 8 (EMS 2013); and
- schooling from K-6 on the Fishing Lake Métis Settlement (FLMS 2013).

Post-secondary education in the region is provided by Portage College, which operates campuses in Frog Lake, Bonnyville, and St. Paul. College programs include academic upgrading, apprenticeship training, and courses focused on:

- business;
- human services;
- health and wellness;
- environmental sciences; and
- native studies.

The college also has selected programs that allow students to accumulate credits towards university programs.

The Blue Quills First Nations College is also located in the RSA, on reserve lands near the Town of St. Paul. The College is a locally controlled Indigenous education centre that offers accredited post-secondary education programs to both Aboriginal and non-Aboriginal students.

7.2.5 Recreation

As outlined in [Table 7.3](#), there are a range of recreational services and amenities in the RSA.

Table 7.3: Recreation Services and Amenities

Municipality	Recreational Amenities and Services
Town of St. Paul	<ul style="list-style-type: none"> • 2 indoor ice arenas • indoor swimming pool • six-sheet curling rink • recreation centre • 14 soccer fields • 15 community parks • 2 tennis courts • 2 sports fields • 8 ball diamonds • St. Paul Golf Course • management of sports group registrations, tennis lessons, and Kidsport funding by the Town’s Community Services Department (TOSP 2013)
Town of Elk Point	<ul style="list-style-type: none"> • ice arena • spray park • golf club • curling rink • recreation centre • outdoor attractions, including campgrounds and trails
County of St. Paul	<ul style="list-style-type: none"> • a number of campgrounds, RV parks, ball diamonds, hiking trails (including the Iron Horse Trail) and other recreational amenities located throughout the County
Town of Bonnyville	<ul style="list-style-type: none"> • the Centennial Centre, a multi-purpose recreation centre which has two ice rinks, an indoor track, climbing wall, and other fitness and event facilities • several parks and playgrounds • golf course • curling club • swimming pool • skating park (TOB 2013)
M.D. of Bonnyville	<ul style="list-style-type: none"> • 10 municipally-owned and operated campgrounds (MDB 2013) • Kinosoo Ridge Snow Resort • opportunities for a variety of outdoor pursuits including boating, camping, and fishing • an agreement with the Town of Bonnyville allowing M.D. residents equal access to recreation facilities in the urban centre (Poole 2012, pers. comm.)

7.2.6 Social Services

Social service providers in the St. Paul area (town and county) include:

- Alcoholics Anonymous and Narcotics Anonymous;
- Mannawanis Native Friendship Center Food Bank;
- St. Paul and District Crisis Centre; and
- Family and Community Support Services (FCSS).

FCSS is a funding partnership, between each local municipality and the province, providing preventative social programming with the help of volunteers. Among the

programs and services offered are: counseling services, youth programs, a mom'n'tots program, a seniors assistance program, and meals-on-wheels (COSP 2013b, FCSS 2013).

According to an FCSS representative with the County of St. Paul, the presence of temporary workers in the region has driven increased demand for some services (e.g. demand for mom and tot services by partners of temporary workers living in campgrounds). It is also noted that temporary workers are not considered in the FCSS population-based funding formula (Fodchuk 2013, pers. comm.). In Elk Point, the FCSS office is increasingly being used as a source of information about government services for foreign workers (Easthope 2013, pers. comm.). Social service providers in the region have indicated a difficulty in recruiting staff due to local labour market conditions (Boone 2013, pers. comm.).

In the Town of Bonnyville, social service providers include:⁷

- North Central Child and Family Service Authority;
- Bonnyville and District Family and Community Support Services;
- Bonnyville Canadian Native Friendship Centre;
- Bonnyville Indian Métis Rehabilitation Centre;
- Catholic Social Services; and
- several regional programs that focus on addiction prevention and community outreach.

Social service organizations operating in the community report several challenges (Beale 2013, pers. comm.) including:

- the need for affordable housing programs;
- full capacity in child care services;
- problems recruiting and retaining quality workers in the social service sector;
- integrating foreign workers; and
- overall capacity issues.

Social service organizations operating in the Bonnyville region are currently at or near capacity and are unable to increase services under current staffing levels. The growth of

⁷ The M.D. of Bonnyville has a funding arrangement with the Town of Bonnyville, allowing M.D. residents to utilize available social services in the town.

new residents in the community can contribute to service demands, as these residents often lack extended family support and they tend to seek help from community organizations (Beale 2013, pers. comm.).

In addition to the services identified above, some Aboriginal communities in the RSA have additional social services available for their community members (e.g. social worker in the community, child and family services department).

7.3 Social Infrastructure Effects

Population growth under Baseline Case, Application Case and PDC assumptions will require additional social infrastructure in the RSA as demand for social infrastructure is expected to increase largely in line with population effects. The increase in demand for social infrastructure will require additional facilities, programming, and staffing.

Table 7.4 provides an overview of effects on selected social infrastructure indicators by 2018.

The social infrastructure indicators were selected with a view to illustrate generally the effect of growth in the region, not to conduct a full needs assessment for the social infrastructure areas under consideration. The indicators provide only a proxy of social infrastructure requirements, each of which comprises complex systems and interactions with other areas. Further analysis will be required by the appropriate planning authorities and service providers for planning purposes.

Table 7.4 shows that additional social infrastructure will be required even under the Baseline Case assumptions. The table also shows that the Project and PDC-induced population growth will require additional services (i.e. over and above social infrastructure required under the Baseline Case assumptions). The social infrastructure requirements identified in the table are for the RSA as a whole, but will largely fall on the Town and M.D. of Bonnyville where the majority of population effects are expected to occur.

Table 7.4: Additional Social Infrastructure Required by 2018

Social Service or Program	Selected Indicator	Baseline Case ¹	Application Case (Project Effects Only)	Planned Development Case ²	Total ³
Additional Requirements by 2018					
Police Services	Number of Police Officers	3 to 4	<1	<1	4 to 5
Fire Services	Number of Staff/ Volunteers	15 to 16	<1	3 to 4	19 to 20
Health Service	Number of Acute-Care Beds	4 to 5	<1	<1	5 to 6
Education	Number of Teachers	23 to 24	<1	5 to 6	29 to 30

Notes:

- 1) Additional social infrastructure required over and above existing levels
- 2) Additional social infrastructure required over and above Application Case assumptions by 2018
- 3) Total additional social infrastructure requirements by 2018

The nature of the Project's effect on local services and infrastructure is expected to be as follows:

- Project construction will increase the mobile workforce in the region, placing temporary additional demands on regional social infrastructure, such as health and social services, and policing and emergency response services. These effects will mostly occur in or near RSA communities that are in closer proximity to the Project (e.g. Town of St. Paul, Town of Elk Point). As outlined in [Section 7.4](#), Pengrowth will undertake a number of mitigation and management measures (e.g. camp accommodations, on-site services) to reduce construction-related effects on regional infrastructure and services; and
- Project operations will:
 - create stable, well-paying employment that will attract permanent residents to the region who are less likely to draw on social supports or certain social services (e.g. affordable housing, income support) but will create additional demands on other social infrastructure, such as health and education services;
 - draw operations workers from outside the region who will bring spouses and family members with them, increasing the labour pool and volunteer base on which local service providers can draw; and
 - increase the potential for traffic accidents and industrial accidents that could in turn place demands on policing, emergency response and health services in the region.

The long-term Project effects on social infrastructure, in line with population effects, are expected to be negligible.

With respect to the PDC, a number of service providers indicated that they are well positioned to plan for and address most future growth forecasted under PDC assumptions. The one exception is FCSS in the Town of Bonnyville, who report that they are currently operating at, or very near, capacity. In general, service providers will likely face some challenges in meeting increased demands, including attracting and retaining qualified staff and securing predictable, sustainable government funding.

While service providers might face challenges in meeting the increased demand, future growth can also help generate opportunities to address this increased demand by:

- increasing funding from the federal and provincial governments (e.g., per capita funding support for certain programs and services);

- increasing the number of businesses in the area that can offer support for community programs and infrastructure used by residents;
- increasing the labour pool and volunteer base on which local service providers can draw; and
- increasing revenues to local government, which can be used to increase investment in public infrastructure and services.

Growth in a community can also help increase the breadth and nature of social infrastructure services available to local residents (e.g., specialized health services and broader educational offerings).

For Aboriginal communities in the RSA industrial development both limits opportunities for traditional pursuits, and makes available income and employment opportunities to people with the requisite skills. Many Métis and First Nations community members currently need, and may continue to need, support in managing the changes brought on by development. This assistance may be needed in different forms for different people. For example, some may need programs aimed at keeping their children in school, others will need employment readiness training, and still others will need counselling for a range of social issues, including addictions. The closely knit nature of small Aboriginal communities necessitates that any assistance or support offered will need to be highly personal.

7.4 Mitigations and Management Measures

Pengrowth's use of on-site camp accommodations during both construction and operations is largely driven by worker recruitment and retention considerations. However, the camps also have the ancillary effect of reducing the Project's effect on the resident population and its effect on social infrastructure in the region.

Pengrowth will implement a number of additional initiatives to both mitigate the social infrastructure effects of the Project and to support its role as a good corporate citizen in the region. Specifically, Pengrowth will:

- put in place Project-related measures to mitigate effects on regional social infrastructure, including:
 - developing and implementing an emergency response plan. This will include putting in place fire and emergency services such as an on-site first aid facility with trained medical personnel, emergency transportation vehicle and fire-fighting equipment. Pengrowth's personnel and contractors will also have the appropriate Health and Safety Training;

- employing on-site security services and procedures, including controlled gates, check-in procedures, and camp-based security officers on duty 24 hours. Pengrowth will also offer in-house security services to assist the RCMP within, and sometimes outside, the Project lease boundaries (e.g., securing accident scenes, assisting with highway closures);
 - maintaining explicit and enforced workplace policies with regards to the use of alcohol, drugs, and illegal activities;
 - offering shift schedules that provide workers with sufficient time off to enjoy leisure activities in their home communities;
 - providing operations-related employees with access to the company's confidential employee assistance plan, which provides support for families and individuals who may experience difficulty dealing with personal, family, or work-life issues that can affect one's health and well-being; and
 - establishing on-site recreation facilities for camp workers, including a TV room, a games rooms, a library, and an exercise room.
- support local community initiatives (e.g. financial and in-kind contributions to social groups, education institutions, and health care providers), where appropriate; and
 - cooperate with service providers (e.g. health, social, education), government, and other industrial operators in the region to assist in addressing effects of the Project and resource development in general by:
 - communicating its development and operational plans with the appropriate agencies; and
 - working with the provincial and municipal governments on the implementation of relevant planning initiatives, where appropriate.

8. Transportation

8.1 Scope

This section discusses transportation issues in the region with a focus on traffic volumes and safety along the access routes linking the Project and other industrial activity to the major population centres in the RSA, including the towns of Elk Point, St. Paul, Bonnyville and Vermillion. Specifically, the analysis focuses on the following road segments:

- Hwy 41, north and south of Elk Point;
- Hwy 29, near the intersection of Hwy 41;
- Hwy 646, east of Hwy 41 at Elk Point to RR 50;
- Hwy 657, north of RR 50 to Hwy 659 near Bonnyville; and
- Range Road 50, which links the Project to Hwys 646 and 657.

A Project-specific traffic impact assessment (TIA) has been undertaken (McElhanney 2013). The effects estimates for the three development cases presented in this section are in line with the findings of the TIA.

8.2 Situation Analysis

8.2.1 Regional Road Network

The RSA has a well-developed road network, consisting of a number of primary and secondary highways. Major highways in the region include (Figure 2.1):

- Hwy 41, providing north-south travel through the region and connecting the Town of Bonnyville to Hwy 16 (the Yellowhead Hwy); and
- Hwy 29, which connects St. Paul to Hwy 41⁸ to the east and Lamont to the west.

Secondary highways within the RSA that are of relevance to the Project include:

- Hwy 646, which connects Hwy 41 near Elk Point to Lindbergh; and
- Hwy 657, which connects north from the Project to both Hwy 659 near Bonnyville, as well as Hwy 41.

⁸ The rural segments of both Hwy 41 and 29 in the RSA are two-lane undivided roadways

Project access is via Range Road (RR) 50 (also known as the Murphy Road) which connects Hwys 646 near Lindbergh to Hwy 657 by Muriel Lake. Refer to Figure 2.1 Regional Study Area for a map of the road network in the region.

The area is host to a number of oil production and storage facilities and well sites. The majority of the workforce in the area travels to and from these sites in company vehicles.

8.2.2 Traffic Volumes

Traffic volumes in the RSA are increasing due to a number of factors, including existing heavy conventional oil and gas and oil sands projects commencing and expanding, pipeline construction and as a result of general economic activity. Volumes on various roadways that link the Project to the communities of Elk Point, St. Paul, Bonnyville and Vermillion have seen varying levels of growth over the past number of years. Specifically:

- Hwy 29 east of St. Paul, near the intersection with Hwy 41, has seen an increase of 10% over the past five years, and 23% over the past nine years;
- Hwy 41 north of Elk Point has seen an increase of 30% over the past five years, and a 40% change compared to nine years ago;
- volumes on Hwy 646 west of Lindbergh have increased by 32% over the past five years, but only by 6% compared to nine years ago, when levels were relatively higher; and
- Hwy 657, near the intersection with Hwy 659 east of Bonnyville has seen increases of 32% and 43% over the past five and nine years, respectively.

[Table 8.1](#) shows the growth in traffic volumes on select highway control sections (CS) during the 2003 to 2012 period.

Average annual growth rates in traffic volumes, ranging between 1% and 4% are reflective of the region's level of economic activity. Growth rates on the segments identified for analysis within the RSA are in-line with, and in some cases, higher than the Provincial average for rural highways, which typically range between 2% to 2.5% per annum.

Table 8.1 Historic Traffic Volumes on RSA Highways

Hwy	CS	Description	AADT			5-Year Change (07-12)			9-Year Change (03-12)		
			2003	2007	2012	AADT	Total %	AARC %	AADT	Total %	AARC %
41	22	N of 50 Ave in Elk Point	2,450	2,650	3,450	800	30%	5%	1,000	41%	4%
41	22	S of 29 N of Elk Point	1,620	1,930	2,080	150	8%	2%	460	28%	3%
29	10	W of 41 N of Elk Point	1,090	1,220	1,340	120	10%	2%	250	23%	2%
646	4	E of 41 S of Elk Point	1,590	1,280	1,690	410	32%	6%	100	6%	1%
657	4	S of 659 E of Bonnyville	700	760	1,000	240	32%	6%	300	43%	4%

Notes: AADT = average annual daily traffic. CS = Control Section. AARC = annual average rate of change.

Source: AT 2013a.

Although volumes have seen substantial relative increases throughout this period, the daily vehicle movements in the region are still relatively low. Current volumes, measured as annual average daily traffic (AADT, or two-way vehicle movements) on the highway segments analyzed here are as follows:

- 3,450 AADT on Hwy 41 north of Elk Point;
- 1,690 AADT on Hwy 646 east of Elk Point;
- 1,340 AADT on Hwy 29 near Hwy 41; and
- 1,000 AADT on Hwy 657 north of the Project.

Traffic volume on each of these four highway segments is well below the carrying capacity of these highway classifications, which is generally considered to be in the range of 10,000 AADT, before twinning is required.

Despite measured volumes that are within the capacity of the area roadways, municipal and other respondents note increasing traffic levels, commenting on the general level of 'busyness' for area roads. Elk Point, which is home to a number of transport companies and trucking operators, is experiencing higher volumes in and around the town site (Casey 2013, pers. comm.).

Range Road 50 is an industrial road under the jurisdiction of the County of St. Paul that was constructed about 25 years ago. Fifteen years ago, the road was paved and upgraded by the County to the equivalent quality and width of a two-lane provincial secondary highway with a speed limit of 100 km per hour. The upgrade was made possible through a grant from Alberta Transportation and with the participation of industry in the area. RR 50 has steady truck traffic, and current volume is in the range of 900 AADT (McElhanney 2013, deMoissac 2013, pers. comm.).

8.2.3 Road Network Improvements

According to the County of St. Paul, potential upgrades to road infrastructure in the RSA include:

- a new pavement overlay for RR 50; and
- potential upgrade to the Hwy 41 / 29 intersection.

The County has applied to Alberta Transportation for support in paying for the new overlay to RR 50, a project which is estimated to cost \$7 million. According to the County, the Hwy 41 / 29 intersection has been the subject of a number of studies by Alberta Transportation over the years. As of November 2013, the potential for either of these projects proceeding remains uncertain (deMoissac 2013, pers. comm.).

The CLOSA CRISP lays out the infrastructure requirements, including road and highway upgrades, for future oil sands development in the Cold Lake Oil Sands Area. Based on high level estimates regarding future investment levels, the study indicates that additional lane capacity could be required on Hwy 28 through Bonnyville and Hwys 29 and 881 through St. Paul (GOA 2012). The necessity of these upgrades is dependent on the development scenario used in the analysis actually occurring. The CLOSA CRISP was completed in February 2012, and as of September 2013, the document was under review by the Government of Alberta.

8.2.4 Traffic Safety

Traffic safety along the identified highway segments in the RSA has been the subject of focus for area RCMP detachments. Concerns are related primarily to truck traffic in the area and the related driving habits of drivers, including speeding (Casey, pers. comm. 2013).

The frequency and severity of collisions vary across the RSA roadways. [Table 8.2](#) provides a summary of the collision rates on RSA road segments over the past five years.

Table 8.2 Collision Rates on RSA Highways

Hwy	Control Section	Section Description	Collision Rate per 100 Million Vehicle Km				
			2007	2008	2009	2010	2011
41	22	N of 646 to S of 29 N	203	224	234	222	196
		(% of Prov. Avg.)	175%	196%	213%	206%	196%
29	10	E of 881 WJ to W of 41	147	162	137	151	165
		(% of Prov. Avg.)	127%	142%	124%	139%	165%
646	4	E 41 S of Elk Point to N of 893	160	172	151	162	141
		(% of Prov. Avg.)	106%	117%	108%	116%	109%
657	4	Junction SR 657:04 to S of 659	217	198	172	174	153
		(% of Prov. Avg.)	144%	135%	123%	124%	118%

Note: Collision rates are calculated using five-year rolling averages. Provincial average relates to comparable highway types (e.g. rural primary highway, rural secondary highway).

Source: AT 2013b and Nichols Applied Management Inc.

During the 2007 to 2011 period, collision frequencies on area highways have consistently exceeded provincial averages for two-lane undivided highways. In 2011, the most recent year for which data are available, the collision rate was 9% to 96% higher, depending on the segment under analysis, than the provincial average for comparable highways.

The collision rate for Hwy 41, between Hwy 646 south of Elk Point north to the intersection with Hwy 29, has been roughly double the provincial average over the past five years, but has been trending downwards the last two years. Actual collisions occurring on that stretch of highway have ranged between 5 and 14 in any given year. The RCMP did not express any particular concern related to the level of collisions in the area in comparison to other jurisdictions, but is aware of community concerns and have made traffic enforcement a priority in the area (Casey, pers. comm. 2013).

The collision rates for Hwys 29 and 646 have remained relatively steady during the 2007 to 2011 period, while the rate for Hwy 657 has been declining over the same time period. Collision data is not available for RR 50, although according to representatives of the County of St. Paul and the RCMP, collisions do not appear to be an issue on that roadway (deMoissac, Casey, pers. comm. 2013).

8.2.5 Air and Rail

There is currently no rail access into the RSA although some previously de-commissioned lines have been converted into regional trail networks. Public airports in the region include small civilian operations at Bonnyville, St. Paul and Elk Point. There is currently no regularly scheduled public air service in the region.

8.3 Transportation Effects

8.3.1 Baseline Case

Under Baseline Case assumptions, traffic volumes on regional highways are expected to increase between 2012 and 2018. [Table 8.3](#) presents volume estimates for the relevant RSA roadways under Baseline Case assumptions.

Table 8.3 Baseline Case Traffic Volumes on RSA Highways

Hwy/ Control Section	Section Description	AADT			Change (AADT) 2012-16	Change (%) 2012-16	Change (AADT) 2012-18	Change (%) 2012-18
		2012	2016	2018				
RR 50	At Project Access Road	900	1,100	1,160	200	22%	260	29%
41:22	S of 29 N of Elk Point	2,080	2,210	2,280	130	6%	200	10%
29:10	W of 41 N of Elk Point	1,340	1,440	1,500	100	7%	160	12%
646:4	E of 41 S of Elk Point	1,690	1,870	1,960	180	11%	270	16%
657:4	S of 659 E of Bonnyville	1,000	1,100	1,160	100	10%	160	16%

Source: Appendix 8 and Nichols Applied Management Inc.

Between 2012 and 2018, traffic volumes along regional roadways are expected to increase by:

- 260 AADT (29%) on RR 50 at the Project access road;
- 200 AADT (10%) on Hwy 41 north of Elk Point;
- 160 AADT (12%) on Hwy 29 east of St. Paul;
- 270 AADT (16%) on Hwy 646 south of Elk Point; and
- 160 AADT (16%) on Hwy 657, south of Hwy 659 near Bonnyville.

The estimates provided above indicate volume growth on Hwys 41 and 29 is expected to remain in line with the trend experienced over the past five years. Volumes along Hwys 646 and 657, which have experienced substantial relative increases during the past five years, will continue to grow at rates above the regional average. Volume on RR 50 at the Project access road is expected to grow by 260 AADT (29%), above 2012 levels, due to the commencement of Phase 1 operations.

8.3.2 Application Case

Project-related traffic, as measured at the access road on RR 50, is expected to average 100 AADT during the construction period, peaking at 150 AADT in Q3 2016. Operations related traffic is expected to be 300 AADT once full production is achieved. Project traffic beyond the site is expected to be dispersed throughout the RSA highway network. The extent to which the various RSA highway segments are impacted depends upon the origin and destination of various construction and operations-related trips. [Table 8.4](#) presents estimated volumes associated with Project traffic during peak construction in 2016 and operations related traffic in 2018.

Table 8.4 Application Case Traffic Volumes on Selected Regional Study Area Roadways

Hwy/ Control Section	Section Description	2016			2018		
		Project Effect (AADT)	Application Case (AADT)	Project Effect (% Above Baseline Case)	Project Effect (AADT)	Application Case (AADT)	Project Effect (% Above Baseline Case)
RR 50	At Project Access Road	150	1,250	13.6%	300	1,460	25.9%
41:22	S of 29 N of Elk Point	30	2,240	1.4%	120	2,400	5.3%
29:10	W of 41 N of Elk Point	10	1,450	0.7%	30	1,530	2.0%
646:4	E of 41 S of Elk Point	30	1,900	1.6%	120	2,080	6.1%
657:4	S of 659 E of Bonnyville	100	1,200	9.1%	70	1,230	6.0%

Source: McElhanney 2013 and Nichols Applied Management Inc.

During peak construction activity in 2016 and under Application Case assumptions, traffic volume is expected to be 150 AADT (13%) higher than in the Baseline Case on RR 50 at the Project access site. Once dispersed through the RSA's highway network, peak construction-related effects range from 10 to 100 AADT (or 0.7% to 9%) above Baseline Case estimates for those road segments.

The construction-related AADT estimates are based on averages across the construction timeframe and presented on a daily basis. Actual volumes will be higher on shift-change days, when the portion of the construction workforce that is based in the on-site camp, arrive to or leaves the site. The exact construction schedule has yet to be determined. Therefore, this analysis is based on typical industry standards that include:

- a 3 week on, 1 week off schedule; and
- a weekly shift change that involves only a portion of the total on-site workforce

The resulting volumes on shift change days are expected to be in the range of 330 AADT.

When operations begin in 2018 and full production is achieved, daily traffic generated by the Project is expected to be 300 AADT at the site access road. This represents an increase of approximately 25% above the expected Baseline Case volume in that year. This volume estimate is predominantly driven by trucking related to diluent (arriving) and bitumen deliveries (leaving), which comprises approximately 230 AADT, or 75% of all daily operations vehicle movements. Volumes on the wider RSA highway network are expected to range from 30 (2%) on Hwy 29 to 120 (6%) on Hwy 646, above Baseline Case levels, depending on the segment under analysis.

Pengrowth intends to connect its Lindbergh facility, via a dedicated pipeline, to the wider regional network by 2023 (5 years into the operations phase of the Project). Upon completion of this pipeline, which is outside the scope of this regulatory application, Pengrowth would ship diluent to and diluted bitumen from the central processing facility via the pipeline. As a result, overall traffic volumes at the Lindbergh facility (including Phase one) could decrease by up to 80%, or in the order of 400 AADT, depending on the split used between trucking and pipeline shipments.

Assuming the full use of the pipeline for shipping, the effect of the Project and the entire Lindbergh facility on traffic volumes in the RSA would be reduced by roughly the same order-of-magnitude as indicated in [Table 8.4](#). As such, the effects presented in this analysis represent a conservative (high) assessment, relative to when the volumes expected if pipeline connectivity is achieved.

According to the Project-specific TIA (McElhanney 2013), volumes generated by the Project, including truck traffic, will require the the following changes at the site access road:

- intersection upgrade to a Type IIIa configuration, including:
 - a wider tapered southbound approach to allow for through traffic flow and easier turn-off and merge-in southbound traffic
 - a dedicated turning lane and a wider through lane for northbound traffic

The TIA indicates RR 50 in its current configuration has sufficient capacity to accommodate the expected volumes associated with the Application Case. Refer to [Appendix 8](#) for further detail on the analysis and recommended intersection upgrade.

8.3.3 Planned Development Case

The projects included in the PDC assessment ([Section 2.1.3](#)) are all located in the north-east portion of the RSA, and have limited to no effect on the highway segments around the Project location.

In terms of major operations in the vicinity of the Project, CNRL operates its Elk Point heavy oil battery located approximately 11 km south of the Project. Discussions with CNRL representatives indicate that the facility recently expanded from 15,000 bpd to about 30,000 bpd. Incoming product is delivered by truck, while processed product is shipped via a proprietary pipeline. The company does not foresee any major shift in its current transportation patterns (Blake 2013, pers. comm.).

Discussions with a regional economic development representative indicate sustained levels of activity related to conventional oil and gas production in the area (Bezpalco 2013, pers. comm.). Although no major projects have been disclosed, the analysis assumes continued growth in industry-related traffic in line with that experienced in recent years, including the expansion at the CNRL Elk Point Battery.

8.4 Mitigation and Management Measures

Traffic effects related to the Project are expected to be reduced, in part, by mitigation measures proposed by Pengrowth that include:

- the portion of the on-site construction workforce that is not resident in the RSA will be housed in the on-site camp, thus limiting the majority of workforce-related vehicle movements to once per week on shift-turnarounds; and
- scheduling construction deliveries during off-peak hours.

Pengrowth recognizes concerns expressed by stakeholders and communities regarding increasing truck traffic in the region, and its own contribution to traffic volumes, during both construction and operation of the Project and the entire Lindbergh facility. The company intends to construct a pipeline within approximately 5 years of achieving full production, which will substantially reduce the amount of truck-based traffic generated by its operations. Before this point, and on a continued basis, Pengrowth intends to engage its employees and contractors in an active education and enforcement program to ensure truck trips related to its operations in the region are undertaken in a safe and respectful manner. The company will be available to the local RCMP and municipalities to discuss Project specific traffic impacts and mitigation strategies.

9. Traditional Land Use and Culture

9.1 Scope

This section addresses the effects of the Project on Traditional Land Use (TLU) and Culture from a socio-economic perspective.

9.2 Situation Analysis

Aboriginal peoples have lived in the region for thousands of years, engaging in traditional activities such as hunting, fishing, and gathering. Pengrowth has engaged in consultation with several First Nations and Métis communities, including:

- Cold Lake First Nation;
- Whitefish (Goodfish) Lake First Nation ;
- Saddle Lake Cree First Nation;
- Kehewin Cree First Nation;
- Frog Lake First Nation;
- Onion Lake Cree First Nation;
- Elizabeth Métis Settlement; and
- Fishing Lake Métis Settlement.

Generally, the engagement of Aboriginal peoples in traditional activities has changed over time:

- during the 18th and 19th centuries, trapping supplemented traditional hunting, fishing and gathering activities as a result of the fur trade;
- during the first half of the 20th century, most Aboriginal people pursued a traditional hunting and gathering lifestyle, even though many of their children attended school and some adults participated in the wage economy; and
- during the 20th century, with the emergence of agriculture and subsequently the oil and gas and oil sands industry and increased wage activities in the region, the economic importance of traditional pursuits in Aboriginal communities has declined.

From the perspective of Aboriginal peoples, the relationship between them and their traditional lands is integral to cultural continuity and community well-being.

The external influences affecting Aboriginal communities in the RSA are largely similar to those impacting Aboriginal communities elsewhere in Canada. One external influence facing many Aboriginal communities is resource development. Examples include oil sands development in the Wood Buffalo region, diamond mining in the Northwest Territories, and, in the case of the RSA, oil and gas development. Resource development places pressure on the traditional lands of Aboriginal peoples in a number of different ways, including:

- making portions of land unavailable for traditional pursuits for a period of time, thereby reducing opportunities to carry out traditional activities and to transmit traditional culture and oral history while on the land;
- raising concerns among Aboriginal persons regarding the effect of pollutants on traditional lands and resources, thereby affecting how and where traditional practices are carried out; and
- offering opportunities for increased engagement in the wage economy which limits opportunities for carrying out traditional pursuits and transferring traditional knowledge to Aboriginal youth while on the land.

While resource development poses a challenge to TLU and culture, the mitigations and engagement strategies undertaken by many industrial proponents can also offer opportunities for Aboriginal persons and communities, including:

- employment and training opportunities;
- support for traditional land use (TLU) and traditional ecological knowledge (TEK) studies, oral history projects, and other initiatives;
- support for Aboriginal community projects, cultural retention programs, and historical preservation initiatives; and
- negotiation of benefit agreements with First Nation communities which may contain provisions with respect to: training, employment and business opportunities; support for social, cultural and community initiatives; and financial provisions and cash payments.

It is also recognized that the distribution of effects is not equal among all Aboriginal persons. For example, many Aboriginal persons face barriers, such as lack of education and training, in realizing one of the most often cited benefits of development - employment and income. Those with education, employment, stronger support

systems and internal resiliency will likely cope better with, and obtain more benefits from, change.

9.3 Traditional Land Use Effects

9.3.1 Baseline Case

The traditional land use and culture of Aboriginal groups in the RSA has been and will continue to be affected by a number of external influences, including:

- increased use of traditional lands for non-traditional purposes, whether it be resource development or increased agricultural development and encroaching urbanization;
- government actions (e.g., policies, programs, funding) in a number of areas including governance, land use, education and training and the development and delivery of infrastructure and services; and
- increased access to influences of other cultures through advancements in technology (e.g., television, internet, cell phones).

The relative magnitude of these external influences is not equal and the experience of individual Aboriginal community members might vary.

9.3.2 Application Case

As of late fall 2013, traditional land use (TLU) studies with respect to Project activities have not yet been carried out. Pengrowth remains engaged in consultations with local Aboriginal groups and working on the development of these studies. However, the Project is part of cumulative development in the study area and as such will contribute to cumulative pressures on traditional land use and culture. The results of additional TLU assessment work to be carried out will further inform the discussion and assessment of Project-related TLU effects.

The traditional land use and culture of local Aboriginal peoples, like that of Aboriginal peoples across Canada, will continue to respond and adapt to both external influences – such as resource development, government policy, education, and technology – and internal drivers, such as the desires and aspirations of Aboriginal peoples themselves. Additional land disturbance and population growth associated with approved and proposed resource development projects will diminish opportunities for traditional pursuits in the region and place increasing stress on traditional culture. At the same time, development offers a number of potential benefits including increased wage opportunities, support for TLU and TEK studies, as well as support for cultural retention and historical preservation initiatives.

Effects on traditional land use and culture, along with the development of appropriate mitigation initiatives and engagement strategies, will remain an integral part of ongoing discussions between local First Nations, industry and government.

9.4 Mitigation and Management Measures

Pengrowth recognizes the effects of resource development on traditional land use and culture. The proponent will therefore carry out the following actions to enhance the positive and minimize the adverse effects of its Project:

- undertake progressive reclamation, giving consideration to traditional land use, where possible;
- provide access to traditional users across the lease;
- compensate trappers directly affected by the Project, according to industry standards;
- promote cultural diversity awareness to Pengrowth employees and contractors regarding respect for traditional resource users;
- support specific community projects, such as elder and youth programs, where appropriate; and
- continue working with Aboriginal communities in the region to ensure that their concerns with respect to traditional land use and culture are continually considered during Project planning and operation.

10. Monitoring and Reporting

10.1 General Observations

There is a broad range of socio-economic monitoring that occurs in the region. Without trying to be comprehensive, the following provides some examples of monitoring systems in the public sector that are publicly available:

- periodic population counts:
 - Statistics Canada census, every five years, latest conducted in 2011; and
 - municipal censuses, periodic, latest conducted in 2012 for most municipalities.
- reporting by school boards within their organizational structures, as well as the Government of Alberta on a variety of indicators, such as student enrollment, dropout rate, high school completion rate and satisfaction with education quality – all of which is reported to Alberta Education and provided on-line;
- reporting by the Alberta Health Services North Zone within its organizational structures and up to the Government of Alberta and the public at large on a variety of indicators, such as performance measures instituted by Alberta Health Services and reported by zone in its quarterly Performance Report (AHS 2012, 2013);
- traffic counts conducted by Alberta Transportation and reported on its website under *Traffic Volume at points on the Highway*; and
- crime statistics gathered and published by Statistics Canada, based on the Uniform Crime Reporting Survey.

There is also ongoing data gathering and monitoring of industry activity. Examples include information gathered by the Canadian Association of Petroleum Producers and published in its Statistical Handbook. This data source includes bitumen production and industry spending. Other industry-focused sources include a listing of oil sands projects published periodically by the Oil Sands Review and the Alberta Government's Quarterly Update.

Individual companies report on their own activities through corporate presentations and annual and quarterly reports (if publicly traded). A number of companies also publish reports focusing on sustainability and corporate social responsibility.

The partial listing of socio-economic reporting and monitoring discussed here gives evidence of a decentralized system with many data providers, each with their own reasons for and approaches to data gathering and publication.

10.2 Pengrowth Monitoring and Reporting

Pengrowth is a publicly-traded company and makes public its annual or quarterly reports. The company also maintains a corporate website that contains information on the company, its technology and its projects.

Pengrowth anticipates that it will gather selected socio-economic information on its Project and report it as part of its ongoing engagement with stakeholders. The nature and extent of this monitoring will be established in discussion with stakeholders. It is anticipated that reporting of monitoring results will occur through a number of means, including:

- presentations at functions and meetings;
- newsletters; and
- summary reports.

Over time, the reporting content and frequency may be adjusted depending on feedback received from stakeholders.

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