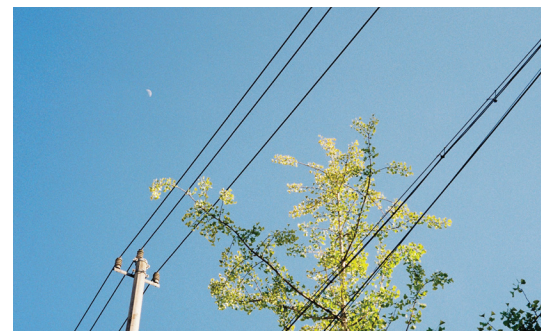


ENERGY

IN BIG LAKES COUNTY, ALBERTA



- › We're a cost-effective gateway to some of the largest oil reserves in the world.
- › Our municipality is top three in terms of potential for oil, natural gas, and geothermal growth in Alberta.
- › We're a part of the Alberta energy advantage – low taxes, expertise, tech and innovation, education, business supports.
- › Our businesses and workforce are highly skilled and knowledgeable in energy already.
- › From existing assets to renewables and clean tech, there are countless opportunities for energy visionaries here.



GO BIGLAKESCOUNTRY.CA



A COST-EFFECTIVE GATEWAY

Big Lakes County is the gateway to the Peace Oil Sands, one of the three oil sands areas of Alberta. The Seal Lake Connector Road was built out of High Prairie in 2011 to provide a shorter route in and out of the Peace Oil Sands for goods and services. This shorter distance translates into fuel savings, lower mileage charges, and more time working on site.

Alberta's oil sands are the third largest oil reserves in the world, after Venezuela and Saudi Arabia. According to the Government of Alberta, the oil sands are reported to contain 165 billion barrels of bitumen that can be recovered under current economics and commercial technologies. Alberta's largest deposit is the Athabasca Oil Sands (79.8%), followed by Cold Lake Oil Sands (12.3%) and the Peace River Oil Sands (8.0%).

Big Lakes County is the gateway to the Peace River Oil Sands through the Seal Connector Road. The Seal Lake Connector Road, which begins on Highway 749 north out of High Prairie, provides a shorter route in/out of the Peace River Oil Sands and major cost savings. It also means that the region is a hub of activity for local companies working in energy production.

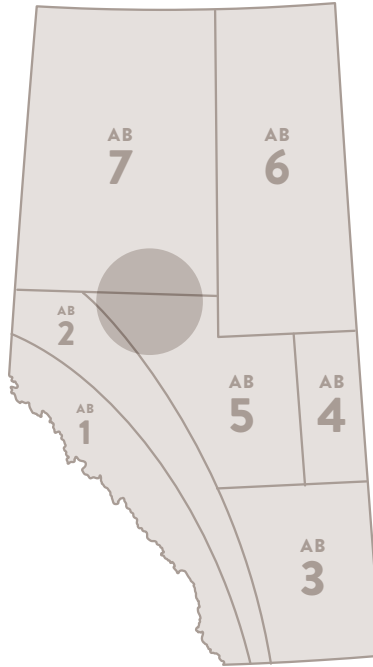


A PRODUCTIVE AREA IN ENERGY

OIL AND GAS PRODUCTION

Big Lakes County is within the 2nd and 3rd highest production zones in Alberta for crude conventional oil. Big Lakes County is within the 2nd and 4th highest production zones in Alberta for natural gas.

Big Lakes County is split into two PSAC areas¹. The northern region of the county falls within PSAC area **AB7**, known as Northwestern Alberta, and the southern region of Big Lakes County falls within PSAC area **AB5**, known as Central Alberta.



¹ – The Petroleum Services Association of Canada divided Alberta into seven geographic regions based on the predominate type of geological interest to the oil and gas industry. These regions, called PSAC areas, are frequently used when analyzing energy data.

Conventional Crude Oil

The PSAC areas AB5 and AB7 are the **second** most and **third** most (respectively) productive areas for conventional crude oil production, contributing 21.2% and 18.9% (respectively) to total Alberta production in 2018.

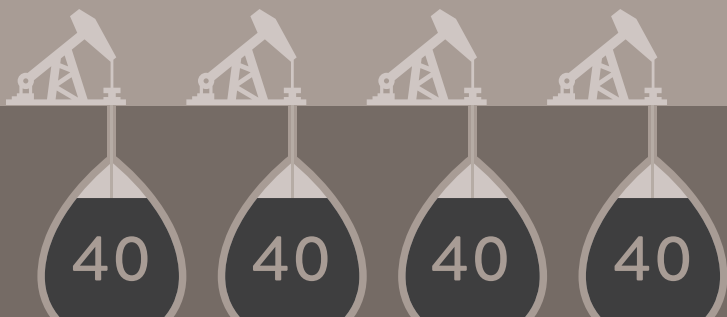
PSAC AB7 is forecasted to increase in both natural gas and conventional oil production by 2028.

Natural Gas

The PSAC areas AB7 and AB5 are the **second** most and **fourth** most (respectively) productive areas for daily natural gas well production⁴, contributing an average of 9.6% and 3.5% (respectively) to total Alberta well production in 2018.

OIL AND GAS QUICK-FACTS

At its peak activity (2011) Big Lakes was home to **160 ACTIVE OIL & GAS WELLS**



8.18

million barrels of **OIL** produced in 2017 (including conventional & non-conventional)



254.8

million cubic metres **NATURAL GAS** produced



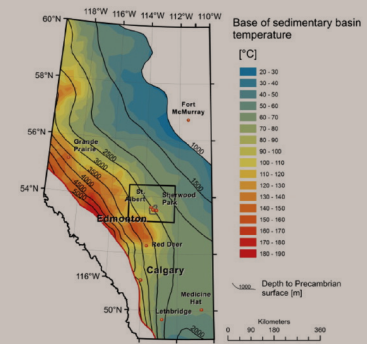
GEOHERMAL PRODUCTION

Big Lakes County is among the top 3 areas in Alberta for geothermal energy production.

According to a recent geothermal study commissioned by Northern Alberta Economic Development, Big Lakes County is in the top three regions of Alberta for geothermal potential out of 42 assessed municipalities in the province. Wells in Big Lakes County, specifically in the southeastern portion, showed strong temperature readings. In addition, the region has relatively thick geological formations which presents high potential for significant volumes of geothermal fluids.

This geothermal energy can be used for direct-use application and power generation. In addition, the opportunity for geothermal exists in many other sectors located in Big Lakes County, such as: agriculture (drying fruits and vegetables, greenhouses, and soil warming/sterilization); forestry (lumber drying, pulp and paper processing); tourism (hotspring bathing).

The geothermal industry in Canada has just started with significant room for new players. One of the first co-produced geothermal electricity project utilizing an active oil and gas wells is currently underway in the Swan Hills of Big Lakes County.



1ST GEOHERMAL CO-PRODUCTION PROJECT

Razor Energy, an Alberta oil and gas production company, is looking to the future energy mix in Canada with the first of its kind co-production geothermal power project in the country. Razor is utilizing its resource production expertise and existing legacy producing oil and gas assets located in the Swan Hills area of Big Lakes county, Alberta to deliver renewable energy to the Alberta power market. The company estimates that the project, which will also include additional natural gas generation, will add a total of 21 MW baseload natural gas and renewable geothermal hybrid power.

Razor has partnered with Alberta Innovates, the University of Alberta, Natural Resources Canada, and private investors to develop this project and advance the geothermal industry in Alberta and Canada. **Alberta industry can lead the way in the customer-demanded energy transition to cleaner energy sources.**



PART OF ALBERTA'S ENERGY ADVANTAGE



Alberta is a global energy superpower.

- » 3rd largest oil reserves in the world (*Invest Alberta, 2019*).
- » Canada is the world's 3rd largest supplier of natural gas, with Alberta accounting for 67% of Canadian production (*Invest Alberta, 2019*).
- » Top exporter of oil and gas in Canada (*Statistics Canada and U.S. Census Bureau, 2019*).
- » Top export countries include the United States, China, Mexico, Japan, and South Korea (*Statistics Canada and U.S. Census Bureau, 2019*).
- » Environmental policies, laws, and regulatory systems in Alberta are some of the most stringent in the world (*Canadian Association of Petroleum Producers, 2019*).
- » Many Indigenous communities are partners in Alberta's energy success (*Indian Resource Council, 2019*).

Alberta means business.

- » Because of Canada's trade agreements, companies operating in Alberta have preferential market access to more than 40 countries with over 1.2 billion consumers and a combined GDP of over US\$41.3 trillion (*IMF World Economic Outlook, 2018*).
- » Alberta has the lowest corporate tax income rate of all provinces in Canada at 12% and soon 8% (*Government of Alberta, 2019*).
- » Alberta is committed to free trade and to reducing interprovincial trade barriers (*Premier Jason Kenney, 2019*).
- » Alberta has no provincial sales tax or harmonized sales tax – a difference of 5% versus up to 15% in other provinces (*Retail Council of Canada, 2019*).
- » Alberta has the lowest corporate tax income rate of all provinces in Canada at 8% (*Government of Alberta, 2019*).
- » Alberta is prioritizing market access and trade infrastructure (*Premier Jason Kenney, 2019*).
- » Alberta has a stable and secure political, business, and banking system (*Government of Alberta, 2019*).
- » Alberta and Canada offer business supports for the energy sector.*

*See incentives and programs offered by Natural Resources Canada; Innovation, Science and Economic Development Canada; Alberta Innovates; Alberta Energy; Alberta Economic Development, Trade, and Tourism; and others

Albertans know the energy sector and are at the forefront of innovation in energy, AI, and beyond

- » 7.6 % of the Alberta workforce is in the energy sector (*Statistics Canada, 2016*).
- » Canada has the highest educated population in the world (OECD, 2017). Alberta's education system is consistently ranked among the top 3 in Canada (*Conference Board of Canada, 2014*) and leading minds in the energy sector graduated from and do research within the Alberta education system.
- » Alberta has a stable and secure political, business, and banking system (*Government of Alberta, 2019*).
- » The oil and gas industry, which is predominantly based in Alberta, is the largest investor in cleantech R&D in Canada (*Canadian Association of Petroleum Producers, 2019*).
- » Alberta is considered a world leader in carbon capture, storage and utilization (*Invest Alberta, 2019*).
- » Alberta is home to one of the world's leading artificial intelligence research groups (*Invest Alberta, 2019*).

OUR WORKFORCE



As a gateway to the Peace River Oil Sands and an area with its own oil and gas production, Big Lakes County is a draw for experienced and educated labour. Approximately 30.7% of Big Lakes County residents are educated in engineering, construction trades, mechanic and repair technologies, or precision production — all of which are highly relevant to the energy sector.

Big Lakes is home to experienced workers who run offices, haul product, operate plants, service oil wells, and so much more. Some of these people did not have to leave the county for their education — receiving their certificates from Northern Lakes College, which is headquartered has six campuses located in Big Lakes County and offers various certifications related to the energy sector.

According to the 2016 Census, Alberta has 174,740 people in the energy labour force, making up approximately 7.6% of the province's total labour force. Big Lakes County has 245 workers in the energy labour force with the majority working in energy extraction. High Prairie and Swan Hills, the two urban centres within Big Lakes County, have 50 and 250 energy workers respectively.

PLAINS MID-STREAM CANADA (PMC)

One of the reasons that PMC has been so successful in our municipality is its skilled and loyal staff of approximately 15 people.

PMC is one of the largest energy employers in Big Lakes County. Their \$47-million facility, located east of High Prairies, was designed to receive and process 700m³/d trucked in crude NGL, and to fractionate C3, C4, and C5+ products. It has six truck out stations, and oil pipeline condensate and butane injection and blending capability. There is a twelve-railcar unloading facility for condensate and butane products at a rate of 1000 m³/d.

TABLE: LABOUR FORCE IN ENERGY SECTOR (2016)

INDUSTRY	BIG LAKES COUNTY	HIGH PRAIRIE	SWAN HILLS	ALBERTA
Energy Extraction	185	35	210	139,680
Energy Distribution	40	12	30	26,440
Energy Manufacturing	20	0	10	8,620
% Total Energy Labour Force	245	50	250	174,470
% Total Labour Force	8.8%	3.8%	35.5%	7.6%

OPPORTUNITIES

- » Acquire existing assets and venture into new developments in Big Lakes County.
- » Find employment and contract opportunities in the energy sector here.
- » We invite you to innovate in Big Lakes County.
- » Generate energy from biomass, geothermal, wind, solar, and hydro. We have it all.
- » Invest in clean technologies.

Innovation exists here

Many companies have developed new technologies, honed expertise, and tried different business models in Big Lakes County. Razor Energy's co-produced geothermal electricity project utilizing an active oil and gas operation is one recent example. Another is Calgary-based Swan Hills Synfuels. Founded in 2005 in Calgary, Swan Hills Synfuels uncovered significant deep coal resources in the Swan Hills area of Big Lakes County that are ideal for in-situ coal gasification, which converts low-cost energy supplies into clean high-value energy products. Swan Hills Synfuels' project in Big Lakes County allowed it to become a global exporter of conversion services and leader in the methanol-based gas conversion value chain in Western Canada.

Huge hydro potential

Deriving its name from the big lakes in the region, including Lesser Slave Lake, Big Lakes County and its neighbours have lakes and river systems to explore for hydropower projects. In its 2010 report for the Alberta Utilities Commission, the consulting firm Hatch Ltd. calculated the hydroelectric energy potential from Alberta's five main river basins at about 53,000 GW hours per

year. Approximately 75% of this ultimate potential is contained in the Athabasca, Peace and Slave River basins within the northern part of the province (Hatch Ltd., 2010).

Biomass is abundant

Big Lakes County has a mixed economy. West Fraser and Tolko Industries have major forestry manufacturing operations in near High Prairie, and we have a significant farming community that produces biomass, too. Biomass includes agriculture and forestry fibre, byproducts, and other feedstocks such as livestock manure and municipal solid waste. There are an estimated 200,000 tonnes of forest residue and 300,000 tonnes of agriculture residue contained within the county and the 30-40km radius around it. Bioindustrial products are the bioenergy, biochemicals, and biomaterials made from biomass, including special chemicals, bioenergy, composites, etc.

Clean tech opportunities

According to Invest Alberta (2019), clean technologies for oil and gas are being developed in small to large Alberta companies and in collaboration with post-secondary institutions and energy multinationals. These present numerous opportunities for investment in companies or licensing of technology. Areas of interest include:

- » Alternate in-situ extraction methods to reduce energy input
- » CO₂ capture and utilization technologies
- » Bitumen partial upgrading
- » Membranes for emission reduction/capture or tailings remediation
- » Methane emissions reduction



Approximately 70 energy companies have operations within Big Lakes County. From our 2017 Energy Sector Tour to our 2019 Energy Sector Appreciation Event, Big Lakes County reaches out to these companies, and to key energy hubs, the towns of Swan Hills and High Prairie, as a partner in their success. We know that the energy sector is rebuilding and re-investing itself. **“Companies are preparing for 2025, not 2005,”** as one energy executive stated. Big Lakes County is transitioning along with industry, looking to the future and looking forward to working with you.

ABOUT BIG LAKES COUNTY

Big Lakes County is one of 352 rural municipalities in Alberta. Big Lakes is the centre of Alberta and is located approximately 300 kilometres northwest of Edmonton, the province's capital city.

Total Area: 13,942.43 sq. km.

Total population in this area: 16,832

- » 52% Indigenous (First Nations or Métis)
- » A small, but diverse immigrant population

Hamlets: Enilda, Jousard, Faust, Kinuso, and Grouard

Major Parks: Hilliard's Bay Provincial Park and Winagami Lake Provincial Park

Major Lakes: Lesser Slave Lake, Winagami Lake, and Snipe Lake

Municipal Tax Rates (mill rate):

- » Residential/Farmland: 4.25
- » Non-Residential: 14.5

Property Tax Rates (mill rate):

- » Residential/Farmland: 6.7674
- » Non-Residential: 18.2084

For up-to-date statistics on Big Lakes County, access the following resources:

- » The Alberta Gov. Regional Dashboard: regionaldashboard.alberta.ca/region/big-lakes
- » Townfolio's interactive data profile on Big Lakes County: townfolio.co/ab/big-lakes



Our visionary, coordinated, and ambitious economic development leadership is available to provide you with more information and to facilitate your success. Please contact Big Lakes County Economic Development Authority at ecdev@biglakescounty.ca.

