

## Oil and gas

By Brad McKenzie, 2003

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Winning the Prairie Gamble Exhibit

## **Introduction**

The history of oil and natural gas in Saskatchewan is a story of constant development and growth. The province's mineral resource potential had very modest beginnings, but with time, enterprise, and innovation a very lively oil and gas sector grew at a significant rate. The sector would sometimes slowly, and sometimes very rapidly, grow into a major part of Saskatchewan's economy, and would become an important part of Canada's energy production as a whole. This essay attempts to outline some very broad themes in the development of oil and gas in Saskatchewan and does so by looking at a variety of aspects that make up the unique story of the industry's growth. Oil and natural gas are looked at specifically in terms of what they are, how they are produced, extracted and transported, as well as what everyday products are created from them. The early history of the search for petroleum resources in Saskatchewan is looked at as a precursor to the exciting time known as the "Dynamic Decades" of the industries rapid development in the 1950s and 1960s. The essay also looks at the specific elements that make up Saskatchewan's oil patch, including key points in the history of the major oil producing regions.

## **Oil and Natural Gas**

Crude oil and natural gas occur in sedimentary basins. They are complexes of hydrogen and carbon, generated through the decomposition of plant and animal remains under heat and pressure. Like coal, their ultimate origin goes back through photosynthesis to solar energy. The source of hydrocarbons is usually organic rich shale from which light liquids or gasses are expelled and migrate upward or laterally. Eventually they are trapped by an impervious layer and accumulate in a reservoir, such as a porous sandstone or limestone.<sup>1</sup> It takes considerable expertise to locate reserves of petroleum. Because of our climate and consumer habits, Canadians are the biggest per capita energy consumers in the world.<sup>2</sup> Canada as a whole, and Saskatchewan and Alberta specifically, are fortunate to

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<sup>1</sup> [www.science.uwaterloo.ca/earth/geoscience/oil](http://www.science.uwaterloo.ca/earth/geoscience/oil), Accessed summer 2003.

<sup>2</sup> Ibid.

have access to large reservoirs of oil. Most of the reserves, as large as those of the Middle East, are locked up in the tar sands of Alberta, and will require an enormous capital investment for extraction. In Saskatchewan, crude oil, or petroleum as it is interchangeably referred, is recovered from the underground reserves mentioned above in several ways. In the primary or most basic method, oil is simply pumped to the surface. The secondary method, water-flooding, consists of injecting water down a neighboring well to force out more oil than can be extracted by straight pumping. In the tertiary methods, or Enhanced Oil Recovery (EOR), substances such as steam, gases, or chemicals are injected into reservoirs to flush out oil that cannot be produced by either primary or water-flooding techniques.<sup>3</sup>

Saskatchewan produced crude oil has a wide range of quality, varying from light sweet crude to heavy sour crude. From these, three types of crude oil are produced, heavy, medium and light gravity. All three types are produced in almost equal proportions.<sup>4</sup> Heavy crude is dark, thick, sticky and viscous, similar to blackstrap molasses. This crude oil has high contents of asphalt and sulfur, as will be discussed below in the section “Saskatchewan’s Oilfields” heavy crude is extracted and produced from the area of Saskatchewan that encompasses Lloydminster, all the way down to Kindersley and area. Saskatchewan also produces great quantities of light and medium crude oil. Light crude is colored light golden brown and flows relatively easy, where medium crude has characteristics in between those of light and heavy crude. The southeast part of Saskatchewan, most intensely around Weyburn and Estevan, produces light crude.<sup>5</sup> Medium crude is produced both in the southeast, as well as in the southwest in the area west of Swift Current.

To extract the oil from Saskatchewan’s soil, two basic types of drilling methods have been utilized. The most common method is vertical drilling, whereby the drilling rig

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<sup>3</sup> This discussion is from University of Saskatchewan, [www.interactive.usask.ca](http://www.interactive.usask.ca) . Accessed summer 2003.

<sup>4</sup> University of Saskatchewan, [www.interactive.usask.ca/skinteractive/modules/mining](http://www.interactive.usask.ca/skinteractive/modules/mining). Accessed summer 2003.

<sup>5</sup> Ibid. Kindersley area has light crude as well as heavy crude. See above citation.

drills down more or less vertically until it penetrates the targeted oil reservoir.<sup>6</sup> In the 1980s a new drilling technology known as horizontal drilling was developed. Horizontal wells are drilled by first drilling down more or less vertically until the drill bit approaches the target oil reservoir and then the drilling bit is steered in a curved path until it enters the target reservoir. Once it enters the reservoir, the drill bit is steered horizontally through the oil reservoir sometimes for distances of more than 1000 meters. These types of wells are much more expensive to drill but are usually more productive.<sup>7</sup> The first horizontal well was drilled in 1987, with a total of almost 5000 drilled to the end of 2002. Approximately one third of the Saskatchewan oil production currently is produced from horizontal wells.<sup>8</sup>

There are great many wells of either drilling technique dotting the Saskatchewan landscape. At the end of 2002, Saskatchewan had approximately 32 000 wells capable of oil production, approximately 21 400 of which are active producing oil wells. One gains a greater understanding of the size and scope Saskatchewan's oil patch, however, when we realize that drilling is only momentary phase in the actual production of petroleum or petroleum products. A Company only turns its attention to the drilling step of the petroleum industry once exploration geologists and geophysicists have found a prospective petroleum site. The "landman" must then secure a lease and negotiate a drilling contract, and then the well is drilled. To accommodate the drilling rig and equipment, the drill site must be prepared. If necessary the land is cleared and leveled, access roads are built, and the reserve pits are dug. Since a source of fresh water is required for the drilling mud and for other purposes, water well is sometimes drilled prior to moving the rig onto location. If other sources are available, then water may be piped or trucked to the site.<sup>9</sup> With the site prepared, the contractor moves in the rig and related equipment. The process, known as rigging up, begins by centering the base of rig-the substructure-over the pie in the cellar, which refers to the exact spot on the surface where

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<sup>6</sup> Government of Saskatchewan, [www.ir.gov.sk.ca](http://www.ir.gov.sk.ca) . Accessed summer 2003.

<sup>7</sup> Ibid.

<sup>8</sup> Ibid.

<sup>9</sup> Mildred Gerding, Fundamentals of Petroleum 3<sup>rd</sup> ed. (Austin: University of Texas at Austin, 1986), 97-133.

the hole is to be drilled. The substructure supports the derrick or mast, pipe, drawworks, and sometimes the engines. A standard derrick, a tall metallic tower raised up in the sky, easily recognized in any oil producing area, is assembled piece by piece on the substructure. Other operations needed to complete the drilling site include erecting stairways, handrails, guardrails; installing auxiliary equipment to supply electricity, compressed air, and water; and setting up storage facilities and living quarters for people who are required to stay with the drill. With the preparation complete, a drilling rig is now set to begin drilling.<sup>10</sup>

Once oil is discovered, drilled for, and found, it now has to be transported. Moving oil and gas from a field to refining and processing plants and petroleum products from refineries to consumers requires a complex transportation system. Saskatchewan oil companies rely largely on the province's infrastructure to move the oil. Oil is transported in Saskatchewan by pipeline, mainly the Interprovincial Pipeline, directly to market. It is also delivered by truck and rail. Numerous pipeline systems for oil and natural gas originate and cross over Saskatchewan. These pipelines deliver crude oil, natural gas, natural gas liquids and refined petroleum products throughout the province. The major pipeline distribution system is the Interprovincial Pipeline, which originates in Edmonton and passes through Saskatchewan en route to eastern Canada and the United States. These pipeline systems in large part export the petroleum production to the United States, which consumes 70 percent of what Saskatchewan produces.<sup>11</sup> About 10 percent of Saskatchewan's production is sold in eastern Canada with a minor amount of oil sold in Alberta. About 20 percent of Saskatchewan's production, however, is currently used within our province. This is comprised mainly of heavy and medium crude oil feedstock required by the NewGrade Upgrader in Regina, Lloydminster Upgrader and the asphalt plant in Moose Jaw.<sup>12</sup>

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<sup>10</sup> Ibid.

<sup>11</sup> Government of Saskatchewan, [www.ir.gov.sk.ca](http://www.ir.gov.sk.ca) . Accessed summer 2003.

<sup>12</sup> Ibid.

The specific structures of Saskatchewan's impressive petroleum industry will be discussed at greater length in the section that looks specifically at the individual developments of Saskatchewan's oilfield, for now, it is interesting to pause and look at the importance of petroleum in our everyday lives. Our houses, factories, and office buildings contain a surprising number of products made from petroleum, and can be found in every part of the typical Canadian home. We all know that our houses may be heated by Saskatchewan natural gas or that our cars and lawn mowers are fueled by petroleum, potentially even originating closer to home than we may think. But the array of petroleum products in the modern Saskatchewan home is dazzling. Even a cursory glance at the instrumentality of petroleum reminds us how the developments of Saskatchewan's oil industry deeply changed the way Canadians live their lives. In the structure of your home itself, there may be Styrofoam insulation; glues in plywood and panel-board shingles and caulking as well as plastic pipes, all made from petroleum.<sup>13</sup> In your kitchen and bathroom; plastic containers; cleansers; utensils; tiles and countertops; toothbrushes; combs and brushes; pharmaceuticals, gas stoves all supplied by the petroleum industry. The plastic components in the electrical appliances in the living room and den, the synthetic fiber in carpets and floor coverings, glues and parts of furniture are all from petroleum as well.<sup>14</sup> Fuel for the car and heat from the home are utterly essential to the Canadian way of life, Saskatchewan plays a significant role through its development of this industry then, of securing general Canadian comfort.

The production of petroleum also means the production of natural gas. The two products are very closely interrelated in that natural gas liquids are stripped from the gas and sold separately from the dry gas.<sup>15</sup> The gas prone areas of Saskatchewan are primarily located along the extreme western edge of the province. Although Saskatchewan was a net importer of gas until 1987, the gas produced here is dry and requires little processing. Saskatchewan's natural gas industry expanded greatly in the 1980s and production peaked in 1995 at 8.7 billion cubic meters (309 billion cubic feet), more than seven times

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<sup>13</sup> Robert Bott, Our Petroleum Challenge: Exploring Canada's Oil and Gas Industry 6<sup>th</sup> ed. (Calgary: Petroleum Communications Foundation, 1999), 29

<sup>14</sup> Ibid.

<sup>15</sup> Saskatchewan Government, [www.gov.sk.ca/enermine/facts](http://www.gov.sk.ca/enermine/facts) . Accessed summer 2003.

the 1983 level.<sup>16</sup> Since 1987, many industrial, commercial and institutional customers within the province entered into direct sales contracts with natural gas producers in Saskatchewan, Alberta, and BC. A significant new, in-province gas market has emerged as a number of large gas consuming industrials commenced operation between 1988 and 1992: NewGrade Upgrader, Millar Weston Pulp Mill, Weyerhaeuser paper mill, Saskferco fertilizer plant and the Husky Lloydminster Upgrader. By 1999 there were approximately 9 300 producing gas wells in the province, and an all time drilling record was set at 1038 natural gas wells drilled. Drilling levels have improved substantially in response to higher prices and an expanded pipeline system.<sup>17</sup> Natural gas reserves in Saskatchewan can readily be connected via the TransGas system to the TransCanada Pipeline system, the foothills pipeline system, and the Williston Basin Interstate Pipeline System to allow delivery of Gas to external markets.

Natural gas production in Saskatchewan involves hundreds of independent companies that find and develop natural gas reserves and operate gathering pipelines and processing plants. Most of the natural gas produced by oil and gas companies in Saskatchewan, however, is transported from the producing fields by Transgress Ltd., a subsidiary of SaskEnergy Inc. TransGas collects the gas through its pipeline gathering system for sales to customers within Saskatchewan or to the pipelines of TransCanada Pipelines Ltd. and Foothills Pipelines Ltd. for out-of-province sales.<sup>18</sup>

Saskatchewan's natural gas pipeline system is an incredible achievement in its own right. Sending raw natural gas from the fields into nearby processing facilities where hydrocarbons (such as water and sulfur) are removed produces pipeline quality natural gas. The remaining "processed natural gas" is more than 90% pure methane and moves through the pipeline system under pressure ranging from 9000 kilo Pascals (kPa) in major transmission lines to 140 kPa in smaller distribution lines. Saskatchewan's compressor stations, located strategically throughout the province, elevate and maintain pipeline

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<sup>16</sup> Ibid.

<sup>17</sup> Ibid.

pressures to ensure a sufficient flow of natural gas reaches thousands of destinations. The stations move natural gas at speeds of 24 to 30 kilometers per hour.<sup>19</sup> Virtually all of the pipelines are buried. High-pressure transmission pipelines transport large volumes of natural gas for thousands of miles. Low-pressure distribution pipelines are used for moving natural gas within communities, eventually being delivered to your workplace or home.<sup>20</sup> The primary purpose of the infrastructure then is simply to transport natural gas to where it can be used as a heat and energy source as well as part of some manufacturing processes.

### **Early History and Development**

In 1923, the Natural Resources Intelligence Service issued a book about the development potential of Saskatchewan's natural resources. In that book, the author pointed out that "unlimited stores of coal, oil, gas, tar and other mineral products have been found in Alberta," but that "mining has received as yet but little attention in this province [Saskatchewan]."<sup>21</sup> Although there was prospect and potential, "the province of Saskatchewan has played but a small part in the mineral production of the dominion. Farming, not mining, has been her forte . . . A general opinion has gone abroad that the prairies and mineral resources are not to be considered together."<sup>22</sup> It would take over two decades to change the view of Saskatchewan as simply an underachiever, but eventually that change came, through many obstacles, resulting in a dynamic growth industry that remains fundamental to the provincial economy. Like many stories in Saskatchewan's development, that growth did not come easy, it is to the story of this development that the paper now turns.

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<sup>18</sup> University of Saskatchewan, [www.interactive.usask.ca/skinteractive/modules/minig/search/mineral\\_types/energy/gas](http://www.interactive.usask.ca/skinteractive/modules/minig/search/mineral_types/energy/gas) . Accessed summer 2003.

<sup>19</sup> SaskEnergy, [www.saskenergy.com](http://www.saskenergy.com) . Accessed summer 2003.

<sup>20</sup> University of Saskatchewan, [www.interactive.usask.ca/skinteractive/modules/minig/search/mineral\\_types/energy/gas](http://www.interactive.usask.ca/skinteractive/modules/minig/search/mineral_types/energy/gas) .

<sup>21</sup> Department of the Interior, *The Province of Saskatchewan: Its Development and Opportunities* (Ottawa: Natural Resources Intelligence Service, 1923), 91.

<sup>22</sup> Ibid.

Although much of the development of Saskatchewan's oil patch occurred as a result of an intensive exploration effort following the major Leduc, Alberta discovery in 1947; significant attempts to develop the resource in Saskatchewan had taken place much earlier. From 1900 to 1919, fourteen wells were drilled in Saskatchewan and from 1920 to 1929, eighteen; all wells were unsuccessful.<sup>23</sup> But there was already present a willingness to search out and invest in the enterprise. By 1934, Saskatchewan had a successful commercial natural gas well near Lloydminster, and excitement steadily grew around the find. By November of the same year, Lloydminster had over 200 homes already connected to a natural gas pipeline from this well and was running gas-burning stoves!<sup>24</sup> The excitement around Lloydminster grew and exploration continued apace all around the area. Colony oil and Gas Company brought in two producing gas wells in 1935 and by 1937 the Dinah Oil Company limited had a well producing a good flow of good quality oil.<sup>25</sup> Lloydminster's finds were early and inspirational, but producers in the area were having problems with the unique heavy oil of the area. A local man named Charlie Mills, one of many very enterprising and innovative oil pioneers in the province, introduced the rotary drilling rig to Lloydminster, this solved some of the problems of heavy oil, and more producing wells began to dot the country side.<sup>26</sup> Significant gains were quite rare, however, and although Saskatchewan had its first truly commercial crude oil discovery in 1944, it would take great investments of time, labour, and money just to get to the starting point. Although the search for oil in Saskatchewan continued slowly, it began to look bleak in the years leading up to the Leduc discovery in Alberta. The industry in Saskatchewan in the 1930s and 1940s had to face very grim economic facts; the return was not apparently worth the investment. Exploration and development lagged as it began to appear that money could not be made on capital investment in the sector. In 1946, the year prior to Alberta's massive Leduc discovery, Saskatchewan's production

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<sup>23</sup>University of Saskatchewan, [www.interactive.usask.ca/skinteractive/modules/mining/search/mineral\\_types](http://www.interactive.usask.ca/skinteractive/modules/mining/search/mineral_types) . Accessed summer 2003.

<sup>24</sup>Franklin L. Foster, Alan G. Griffith, Bordering on Greatness: A History of Lloydminster's First Century 1903-2003 (Lloydminster, Foster Learning Inc., 2001) 86.

<sup>25</sup> *Ibid*, 88.

<sup>26</sup> *Ibid*, 86-96.

was only 137 000 barrels of oil from 21 wells—all of it heavy crude and none of it attractive to refineries.<sup>27</sup> Nevertheless entrepreneurs and enterprising citizens continued on a vigilant search for “black gold” hiding somewhere beneath the prairie. By the late 1940s and early 1950s, it became obvious that the initiative and determination of these people was beginning to pay off.

### **Dynamic Decades**

Interestingly enough, the single most important event in Saskatchewan’s oil history actually occurred in Alberta. On February 17, 1947, after drilling 133 dry holes or non-commercial wells across Western Canada—Imperial Oil finally struck oil at Leduc, a hamlet near Edmonton. Overnight, all of Canada went from oil poor to oil rich.<sup>28</sup> The Leduc #1 blowout was followed immediately by Leduc #2 striking a vastly bigger Devonian reef formation at 1657 meters—this formation became one of the most prolific in Canada and the Leduc discovery put Alberta on the world petroleum map.<sup>29</sup>

It soon became clear that Western Canada could support prolific oil reserves and the search for oil leapt into full stride. When more discoveries followed, the industry began to appreciate the diversity of geological structures that could contain oil. The widening scope of exploration soon led to the investigation of basin lands in Saskatchewan, spilling over into the southern half of Saskatchewan. Numerous heavy oil discoveries followed in the Lloydminster area, with light oil finds as well in other parts of the province. Exploratory drilling in Saskatchewan peaked for the decade in 1954.<sup>30</sup> Throughout the 1950s in Saskatchewan there was a rapid expansion in the oil and gas sector. It became clear that the early local belief in the potential of the province was true. Although in 1960 the petroleum industry was still relatively new, it was developing at an incredibly rate. In 1946, Saskatchewan produced 136 887 barrels of oil; in 1953

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<sup>27</sup>Ed Gould, *OIL: The History of Canada’s Oil and Gas Industry* (Hancock House Publishers),99

<sup>28</sup> Robert Bott, 15

<sup>29</sup> Peter McKenzie-Brown, Gordon Jaremko, David Finch, *The Great Oil Age: The Petroleum Industry in Canada* (Calgary: Detselig Enterprises, 1993),46

<sup>30</sup> See McKenzie-Brown, Jaremko, Finch, 47, for the full story of the post Leduc boom, borrowed here at length.

Saskatchewan produced 2 791 472 barrels, but only two years later in 1955 Saskatchewan was producing 11 317 168 barrels, and by 1958 the province was in full boom at 46 500 000 barrels per year.<sup>31</sup>

In 1950, local independently owned facilities in Unity, Lloydminster and Kamsack provided the only natural gas service in Saskatchewan. In 1951, Saskatchewan Power Corporation (SaskPower), the province's electrical utility, was designated as the provincial authority in the distribution of natural gas. The new market created by the policy started a flurry of drilling activity in Saskatchewan.<sup>32</sup> The first provincially owned natural gas distribution system was constructed in 1952 from the first discovery wells to the two nearest sizeable communities, Kindersley and Brock. This system is still in operation. In 1953, the transmission system was expanded to neighboring communities as well as to Saskatoon. The Coleville field gathering system followed the next year. The natural gas transmission system expanded north in 1955 to the city of Prince Albert, and at the same time created a second system in the south from the newly developed Success gas field to Swift Current. The south transmission system was expanded in 1956 to Moose Jaw and the north system expanded to Humboldt and North Battleford.<sup>33</sup> Regina first received natural gas service in 1957 and the Steelman line was built in 1958 to serve Weyburn and Estevan. By 1962, 140 communities had natural gas service. This was a phenomenal accomplishment and placed Saskatchewan second only to Alberta in "facilities per capita" in North America. The company had installed over 5600 kms of pipeline to deliver gas to just 89 000 services. Over the next 20 years, both high and low-pressure facilities were expanded to provide service to nearly every community in Saskatchewan of any significant size. By the end of 1982, the gas system had doubled in size.<sup>34</sup> Natural gas heating and energy was readily available province wide. Throughout the 1950s and 1960s the petroleum industry reshaped the way the people of Saskatchewan lived.

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<sup>31</sup> Stanford Research Institute (SRI), A Study of Resources and Industrial Opportunities for the Province of Saskatchewan: Prepared for the Province of Saskatchewan Industrial Development Office (Menlo Park, CA: December, 1959),216.

<sup>32</sup> TransGas, [www.transgas.sk.ca/aboutus/history](http://www.transgas.sk.ca/aboutus/history) . Accessed summer 2003.

<sup>33</sup> Ibid.

<sup>34</sup> Ibid.

By the early 1950s oil replaced coal as Canada's largest source of energy. Canadians fully embraced the lifestyle that the petroleum provinces made possible. Canadian embraced the new products and services of the oil age in these decades with eagerness, from shiny cars and plastics to air travel. In most regions of Canada, wood and coal furnaces were steadily replaced with cleaner, more convenient oil or gas heating.<sup>35</sup>

### **Saskatchewan's Oilfields**

The large areas of oil and gas production In Saskatchewan cover very broad and loosely defined regions. The single largest and most significant region stretches from just north of Lloydminster all the way south, through the Kindersley area, to the south and west of Swift Current; ranging in productivity and quality along the way. Another major region, traditionally the major oil area in the province, stretches in a broad circular path that includes the communities of Weyburn, Midale, and Estevan.

The Weyburn-Estevan oil patch is a vital part of the province's industry. Although the Lloydminster area as a producer eventually supplanted it, the southeast regions produce a sweet crude oil found with relative ease.<sup>36</sup> This oilfield was also the first significant oil patch in Saskatchewan, with a major find occurring at Midale in 1953. Midale is located approximately midway between Estevan and Weyburn, after the Midale find, it took only 3 years to have 80 producing wells in the area. This area has also proven to be particularly innovative among Western Canadian oil regions and potentially within the general petroleum industry. In the early 1960s, production began to decline and a series of water-flood methods were used to improve recovery rates.<sup>37</sup> More recently, however, and perhaps more significantly, the Estevan-Weyburn patch has pioneered the use of CO2 technology. A leader in injecting carbon dioxide into the oilfield to act as an Enhanced Oil Recovery (EOR) project the southeast of Saskatchewan is leading the way in improving efficiency and meeting the benchmarks of greenhouse gas emission

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<sup>35</sup> Robert Bott, 15.

<sup>36</sup> Estevan Community Access Project, [www.cap.estevan.sk.ca](http://www.cap.estevan.sk.ca) . Accessed summer 2003.

benchmarks. By pumping CO<sub>2</sub> into the oil-bearing formation PanCanadian Petroleum not only forces out the remaining oil but also avoids dispersing the CO<sub>2</sub>, a greenhouse gas, into the atmosphere. Known as the Weyburn enhanced Oil Recovery Project, it is anticipated that some 20 million tonnes of Carbon Dioxide will be permanently sequestered over the life span of the project.<sup>38</sup> This will not only extend the life of the Weyburn field by approximately 25 years, but is also an important innovation in meeting the standards of the Kyoto protocol.

The Lloydminster oilfield is known for its unique brand of oil known as heavy crude or heavy oil. The story of Lloydminster, a major producing area in both Saskatchewan and Alberta, has particularly modest beginnings. In 1926 a Lloydminster farmer was drilling for water to be able to water his cows. When he finally struck water at 160 feet—his cows refused to drink it; tests were sent to the U of A which came back saying there was significant amounts of petroleum distillates in the water. Lloydminster had been bitten by the oil bug. By 1933 community members were putting together money to drill wells around town. There were often sings of oil, but Lloydminster's heavy oil brand made it difficult to extract.<sup>39</sup>

Lloydminster's place in oil and gas history was cemented in 1946-7 when Husky Oil Ltd. Constructed a refinery on the town's northern outskirts. Lloydminster's economy would never be the same. Asphalt road constructive and "bunker fuels" used by railways were the principal early markets for Lloyd's brand of heavy crude. Like the Saskatchewan patch in general, Lloydminster's patch was one of constant innovation and development. By 1963, Husky Lloyd was producing higher octane gasoline and a diesel fuel with a lower sulfur content.<sup>40</sup>

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<sup>37</sup> Petroleum History Society, [www.petroleumhistory.ca](http://www.petroleumhistory.ca) . Accessed summer 2003.

<sup>38</sup> Petroleum Technology Research Centre: [www.ptrc.ca/projects/weyburn](http://www.ptrc.ca/projects/weyburn) . Accessed summer 2003.

<sup>39</sup> Franklin I. Foster, 86-88.

<sup>40</sup> Ibid, 90-91.

Glen e. Nielsen, a transplanted Lloydminster farmer, was the founder and president of Husky oil. Nielsen led Lloydminster's pioneering tradition into the petroleum industry. He had the great foresight in the 1950s to acquire the mineral rights to millions of acres of CPR lands. This turned his little company into a major producer.<sup>41</sup> Through more local innovation, and with outside help, a method of transplanting Lloydminster's formerly uncooperative heavy crude was developed by adding various percentages of natural gas liquid condensate, the heavy stuff could now be piped. By 1965 the Lloydminster patch was off and running with markets to the south; a pipeline system in place; and constant innovation and experimentation pushing the industry to new heights.<sup>42</sup>

### **Conclusion**

Saskatchewan's oil and gas industry had very modest beginnings but grew over time to be essential to the Saskatchewan experience. Small prospecting companies searching for oil through difficult and unprofitable years, eventually becoming the second highest oil producing province in the country, with 20% of all Canadian crude oil and equivalent production coming from Saskatchewan. The oil and gas industry is now one of the largest contributors to the provincial economy at 8% of total GDP.<sup>43</sup> Midway through the century it looked as though oil exploration in the province was simply unprofitable, but by the year 2003 the industry boasts some 400n companies employing 22 000 people directly or indirectly in the upstream oil and gas sector. The employment that oil and gas companies provide is now relied on heavily by many rural areas and smaller towns and cities and is the backbone of whole regions of the province. It is good news then that the future of the industry looks as bright as ever. There is excellent potential for more growth and development in the industry. Enhanced Oil Recovery methods point to good development potential for Saskatchewan's 25 billion barrels of light, medium and heavy oil deposits. The spirit of innovation and enterprise that Saskatchewan has shown in this sector should continue to make oil and gas a growth industry in the province for many more decades. Opportunities to market our Enhanced oil recovery technologies provide

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<sup>41</sup> Ibid, 91.

<sup>42</sup> Ibid, 91,93.

<sup>43</sup> Government of Saskatchewan, [www.ir.gov.sk.ca](http://www.ir.gov.sk.ca) . Accessed summer 2003.

greater potential for the future as well. The two heavy oil upgraders in Saskatchewan, the first in Canada, have increased refinery activity, boosted markets for our heavy oil, and provided stability in the industry.<sup>44</sup> It is naïve to believe that because the oil is in the ground it is only due to settler's luck that Saskatchewan has been able to produce it to such lucrative ends. The story of Saskatchewan oil and gas is that determination, through good times and bad, coupled with an entrepreneurial skill at innovation, is what truly made the resource possible. The story of Saskatchewan oil and gas then, will continue to be one constant growth and development.

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<sup>44</sup> Ibid.