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THE

CRUDE PETROLEUM INDUSTRY

IN

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THE CRUDE PETROLEUM INDUSTRY IN CANADA, 1944

Production of crude petroleum and natural gasoline in Canada during 1944 totalled 10,099,404 barrels valued at $15,429,900 compared with 10,052,302 barrels worth $16,470,417 in 1943. Of the 1944 output, 8,727,366 barrels originated in Alberta; 1,223,675 barrels in Northwest Territories; 125,067 barrels in Ontario and 23,296 barrels in New Brunswick. The net value of producers' sales of crude petroleum in Canada during 1944 was estimated at $14,575,563.

The industry in 1944 provided employment for 2,547 persons and distributed $5,814,676 in salaries and wages; fuel and electricity used during the year totalled $1,000,484 and the cost of process supplies consumed amounted to $242,511. Firms active in 1944 numbered 224 and wells under operation totalled 2,264. The footage drilled, under contract, for petroleum in 1944 amounted to 330,411 feet, of which 12,410 feet were completed by cable drilling, 2,000 feet by diamond drilling, and 316,001 feet by rotary drills. Included in the total footage drilled by contractors were 312,424 feet in Alberta; 10,305 in Saskatchewan; 4,239 in Ontario, and 3,393 in Nova Scotia. In addition to the drilling completed by contractors, there was a considerable footage drilled by oil companies with their own personnel and equipment.

The following is an excerpt from a review on Petroleum in 1944 as prepared by the Bureau of Mines, Ottawa:

"Crude petroleum is produced in Canada from wells in Alberta, the Northwest Territories, Ontario and New Brunswick. The total production in 1944 was in excess of 10,000,000 barrels, 89 per cent of which came from Alberta. The Turner Valley field in that province contributed 82.5 per cent of the total Canadian output as compared with 95 per cent in 1943. This percentage decrease can be traced partly to more than a twofold increase from other fields in Alberta, and partly to a marked increase in production in the Norman field, Northwest Territories. By far the greater part of Canada's requirements of crude petroleum is imported.

"In 1944 there was a record amount of exploration and drilling in Alberta and Saskatchewan in search of new sources of petroleum. No discoveries of oil were made in Saskatchewan, but in Alberta several new producers were added to the list.

"The Rundle (Madison) limestone of Palaeozoic age is the source of almost the entire production of petroleum in the Turner Valley field. Until June, 1936, production in the field came almost entirely from the wells in the gas cap and was termed "naphtha", an unstable natural gasoline. Since then, however, development has been diverted toward the western deep-lying belt of the limestone, the existence of which had already been indicated by marginal wells. Production comes from the same porous horizons that yield the naphtha in the gas cap, and the gravity of the oil increases progressively down the dip slope from 45° A.P.I. to 38° A.P.I., beyond which lies edge water. (By way of explanation it should be noted that the specific gravity of a heavy crude oil is about 10° A.P.I.; thus, as the specific gravity decreases, the degrees A.P.I. increase. The letters A.P.I. following the degrees mean that the specific gravity is measured in terms of the American Petroleum Institute scale).

"In 1944 drilling in Turner Valley was largely in the central part of the field, which had formerly attracted little attention owing to its supposed indifferent yield. There was a steady development of the northern section of the field. In the central region drilling was encouraged by financial aid from Wartime Oils, Limited, a Crown company, formed in 1943, which lends money to the operators on the basis of a small royalty and low interest, to be repaid out of production. Twenty producing wells were completed under this scheme in 1944, three of which were better than average producers. Twenty-one other wells were also completed in Turner Valley, two of which are near the southern end and fourteen are north of Sheep River. Neither the northern nor the southern limit of the field has been fully defined as yet by drilling.

"Activities in the northern end of Turner Valley were stimulated through the finding of oil in wells on the east side at depths below the known water level on the west side. All wells flow naturally, and, with one exception that turned out to be a water flow, those that have ceased to be oil wells have passed into the category of gas wells.

"The pipe-line charge for pumping oil from Turner Valley to the Imperial Oil Refinery at Calgary was reduced on May 1, 1944, from 9½ cents a barrel to 7½ cents, thus bringing the price of 41° A.P.I. crude up to $1.68 a barrel, in tanks at the well. The differential of 2 cents per degree A.P.I. above and below 41° A.P.I. remained unchanged.

"South of Conrad on the Canadian Pacific Railway an oil of 25.4° A.P.I. gravity was discovered in the Ellis sand at 3,050 feet. This area is 7 miles west of the old Skiff field, where heavier oil was struck in 1927. The old Red Coulee field 7 miles west of Coutts on the International boundary, which produced 329,000 barrels in the past 15 years, was abandoned in 1944.

"Extensive test drilling, usually following geological and geophysical surveys, was continued on the southern plains of Alberta. Results of special interest were obtained at a well in the Princess field, 120 miles east of Calgary. First developed in 1939, this well yielded a total of 30,000 barrels of 27° A.P.I. oil in 1941 and 1942 from just above the Palaeozoic rocks. Production proved difficult, however, owing to high pressure gas and to water. The well was "spudded in" the latter part of July, 1944, and rich lubricating oil was encountered at 3,983 feet in the Jefferson lime of Middle Devonian. It was completed in September and produced over 12,000 barrels by the end of the year. It is the first discovery of Devonian oil in commercial quantity in the plains of Alberta.

"A number of test wells were being drilled along the Foothills from near the International boundary to Folding Mountain near Jasper. Near Lundbreck a hole had reached a depth of 9,857 feet, probably a world's record for cable tools. A hole in the Wildcat Hills west of Calgary was abandoned at 11,155 feet, after striking water in the Rundle limestone; another at Coalspur had reached 10,355 feet and was still being deepened. A third well started at Ram River after No. 2 had obtained a small production from the Devonian limestone had reached a depth of over 5,000 feet.

"The most notable event in the Foothills, however, was the striking, in December, at Jumping Pound, 20 miles west of Calgary, of wet gas comparable to that of the Turner Valley field. This well, a sequel to that drilled to 12,056 feet towards the close of 1943, which struck salt water in the Rundle and was abandoned, reached the limestone at 9,618 feet and a porous zone from 9,636 to 9,860 feet. This zone is believed to correspond to the lower porous zone of Turner Valley. The flow of gas was large and the liquid product ranged from a crude resembling that found in Turner Valley to water-white naphtha. Full testing was not possible before the close of the year.

"The total footage drilled in Alberta was 597,828 compared with 487,923 in 1943.

"A photographic aerial reconnaissance of the Foothills, begun late in July as a joint project of a number of large interests, was intended to cover 9,000 square miles from the International boundary, omitting areas already covered by the Geological Survey of Canada. Many geological and several geophysical parties were also active in Alberta during 1944.

"Prospecting for oil in Saskatchewan continued to be active and the structural and deep test drilling proceeded in association with widespread geological and geophysical surveys. The deep tests at Wilcox, Radville, and Buffalo failed to find gas or oil in commercial quantity, and two other holes were started, one near Elbow, and the other at Swift Current. Three wells, that were drilled south of Unity, had shows of oil, and two of them were completed as gas wells. Several holes were being drilled near Lloydminster, and drilling was done at Yorkton, Torch River, Kisby, Simpson, Maple Creek, and Dysart.

"Although the drilling of wells under the Canol project in the Northwest Territories was discontinued, exploratory drilling was maintained by Imperial Oil, Limited. At the end of 1944 there were 58 wells in the Norman field producing or capable of producing oil, 54 of which were drilled as part of the Canol project. The size of the field as determined by the drilling is 5,000 acres, and recoverable reserves are estimated to range from 30 million to 60 million barrels. The productive formation, a reef limestone, is reached at depths of 1,050 to 1,150 feet in the shallower wells on the right bank of the Mackenzie River, and at 1,706 feet in one of the wells on Bear Island.

"In Ontario, most of the production was again obtained from the Petrolia, Oil Springs, Bothwell, and Mosa fields, with lesser amounts from West Dover, Warwick, Dunwich, Thamesville, and several other townships. Drilling in Kent county was extended into Lake Erie.

"On Gaspé Peninsula, Quebec, no further drilling was done in No. 1 well of Continental Petroleums, Limited. In its No. 2 well, 4½ miles to the west, drilling had reached a depth of over 2,000 feet.

"In Prince Edward Island the deep test well that was started from a pier in Hillsborough Bay in 1943 had reached a depth of 11,868 feet.

"In New Brunswick the geophysical work in the Stoney Creek area was continued. A large acreage was being held in the province for prospecting.

"In Nova Scotia two wells in the Mabou area, Cape Breton, were abandoned; and a well at Kennetcook in the Windsor area had reached a depth of 3,000 feet.

"Production in the Turner Valley field in Alberta came from a total of 257 oil wells and from 49 gas wells. Most of the output is crude oil obtained from the oil wells, and there is a small output of naphtha from gas wells. Considerable natural gasoline is recovered from the gas treated in absorption plants.

"Outside Turner Valley, 11 fields in Alberta were producing or were capable of producing in 1944, the largest of these being the Vermilion field 120 miles east of Edmonton.

"Production in the Vermilion field, Alberta, in 1944 was 150 per cent greater than in 1943. This increase can be traced partly to the completion of the new plant, which, by an electrical method, removes the water and salt from the oil. The treated oil is used as a fuel in the locomotives of the Canadian National Railway. Nineteen wells were brought into production in the field in 1944. Farther east, at Lloydminster, on the border of Saskatchewan, a plant was built to treat a somewhat similar crude.

"In the Taber field in the southern part of Alberta, the productive area was further outlined and 3 or 4 miles to the west another pool appears to have been discovered. The oil has a gravity of 19° A.P.I. and is virtually free from water. Its flash point is too low for direct use as fuel and it is shipped partly by tank car to Calgary, and partly by truck to local refineries. From July to the end of 1944 more than 24,000 barrels were produced from two wells at Conrad, 20 miles south of the Taber field, and the oil was shipped to Regina.

"Delivery of crude from the Norman field in the Northwest Territories to the refinery at Whitehorse, Yukon, was started on April 16 and on April 30 the refinery went into operation. Its throughput capacity is 3,500 barrels of crude a day, and its products were 100 octane gasoline, motor gasoline, fuel gasoline, Diesel X fuel oil, and road oil. The refinery, like the pipe-line and the Canol wells, was an undertaking of purely military character. The throughput capacity and the products of the refinery at Norman remained the same as in 1943. The price of ethyl gasoline at Norman was reduced to 55 cents a gallon, and that of aviation gasoline to 68 cents.

"Canada in 1944 imported 57,041,285 barrels of crude petroleum for refining, compared with imports of 49,700,143 barrels in 1943. This represented much the greater part of the total value of imports of petroleum and its products in the two years, the total for 1944 being $100,997,763 as compared with $94,843,848 in 1943. In 1943 the United States supplied 81 per cent of the imports of crude oil; Venezuela, 10.8 per cent; and Colombia, 8.2 per cent. In 1944, however, the United States supplied only 60.4 per cent; whereas Venezuela supplied 21.2 per cent, and Colombia, 17.2. The remainder came from Ecuador and the Dutch West Indies.

"Exports of petroleum and its products from Canada in 1944 were valued at $12,117,533, as compared with $8,652,465 in 1943 and with $848,558 in 1939."

Table 1 - PRODUCTION OF CRUDE PETROLEUM IN CANADA, BY PROVINCES, 1935-1944

Year	New Brunswick		Ontario		Alberta		Northwest Territories	
	Barrels	Value	Barrels	Value	Barrels	Value	Barrels	Value
		$		$		$		$
1935	12,954	18,230	165,041	346,156	1,263,510	3,102,227	5,115	25,575
1936	17,112	24,075	165,495	350,767	1,312,368	3,019,930	5,399	26,995
1937	18,089	25,496	165,205	356,000	2,749,085	4,961,002	1,371	56,855
1938	19,276	27,246	172,641	359,268	6,751,312	8,775,094	22,855	68,565
1939	22,799	32,082	206,379	401,430	7,576,952	9,362,363	20,191	50,477
1940	22,167	31,220	187,644	397,078	8,362,705	10,694,394	18,633	37,265
1941	31,359	44,102	160,238	337,760	9,918,577	13,985,906	23,664	47,328
1942	28,089	39,467	143,845	306,242	10,117,073	15,514,665	75,789	108,477
1943	24,530	34,342	132,492	311,356	9,601,530	15,724,518	293,750	400,201
1944	23,296	32,832	125,067	296,420	8,727,366	14,468,061	1,225,675	652,587

	CANADA	
1935	1,446,620	3,492,188
1936	1,500,374	3,421,767
1937	2,943,750	5,399,353
1938	6,966,084	9,230,173
1939	7,826,301	9,846,352
1940	(x)8,590,978	11,160,213(x)
1941	10,133,838	14,415,096
1942	10,364,796	15,968,851
1943	10,052,302	16,470,417
1944	10,099,404	15,429,900

(x) Includes 331 barrels at $256 in Saskatchewan.

Table 2 - PRODUCTION OF CRUDE PETROLEUM IN CANADA, BY MONTHS, 1944 (Barrel = 35 Imperial Gallons)

Month	(x) New Brunswick	Ontario	Alberta (x)	(x) Northwest Territories	CANADA 1944	CANADA 1943
			(Barrels)			
January	1,836	10,394	759,676	59,606	831,512	856,361
February	1,689	11,712	703,067	71,789	788,257	775,985
March	2,009	10,209	752,690	106,538	871,446	856,649
April	1,844	9,453	712,282	114,331	838,010	832,765
May	2,078	12,250	733,713	104,294	852,335	868,321
June	1,925	10,980	695,158	110,615	818,678	821,869
July	1,881	11,192	725,198	68,071	806,342	843,127
August	1,854	9,831	744,964	70,954	827,603	853,531
September	1,815	11,148	713,353	125,947	852,263	823,054
October	2,266	10,556	730,851	134,409	878,082	855,009
November	2,194	9,612	715,272	128,674	855,752	829,559
December	1,905	7,730	741,042	128,447	879,124	836,072
TOTAL	23,296	125,067	8,727,366	1,223,675	10,099,404	10,052,302

(x) These figures include total output each month.

Table 3 - PETROLEUM WELLS IN CANADA, BY PROVINCES, 1942-1944

		New Brunswick	Ontario	Alberta	Northwest Territories	CANADA
Productive wells at beginning of year.	1942	20	1,956	274	3	2,253
	1943	21	1,852	305	20	2,198
	1944	22	1,728	365	26	2,141
Number of productive wells drilled ...	1942	1	13	45	17	76
	1943	1	1	66	9	77
	1944	1	6	81	32	120
Number of wells abandoned	1942	...	54	14	...	68
	1943	...	144	6	3	153
	1944	...	47	19	1	67
Number of dry wells drilled	1942	...	13	21	...	34
	1943	...	17	19	1	37
	1944	...	18	41	...	59
Number of productive wells in operation at end of year	1942	21	1,852	305	20	2,198
	1943	22	1,728	365	26	2,141
	1944	23	1,690	426	57	2,196

Table 4 - PRODUCTION OF CRUDE PETROLEUM IN CANADA, 1943 and 1944

	1943 Barrels	1943 Total Value	1944 Barrels	1944 Total Value
		$		$
New Brunswick	24,530	34,342	23,296	32,832
Ontario -				
Petrolia and Enniskillen	45,308	105,300	41,433	96,853
Oil Springs	27,270	66,811	28,537	70,774
Moore township	332	772	133	311
Sarnia township	305	709	268	626
Plympton township	26	60	27	63
Bothwell township and Thamesville	25,908	60,212	24,966	58,360
West Dover, Romney, Raleigh and Tilbury East	9,177	21,328	7,642	17,864
Onondaga	11	26	7	16
Mosa township	16,327	37,945	15,585	36,431
Dunwich	1,422	3,305	1,728	4,039
Dawn and Euphemia	439	1,020	257	601
Warwick, Metcalfe and Adelaide townships ...	5,967	15,868	4,484	10,482
Total Ontario	132,492	311,356	125,067	296,420
Saskatchewan	...	...	...	...

Table 4 - PRODUCTION OF CRUDE PETROLEUM IN CANADA, 1943 and 1944 (Concluded)

	1943 Barrels	1943 Total Value $	1944 Barrels	1944 Total Value $
Alberta -				
Turner Valley	9,452,697	15,124,315	8,526,514	13,522,102
Red Coulee	8,928	9,107	5,835	4,755
Wainwright-Ribstone (heavy crude) / Taber-Moose Dome	139,905	591,096	397,217	1,141,204
Total Alberta	9,601,530	15,724,518	8,727,366	14,468,061
Northwest Territories	293,750	400,201	1,223,675	632,587
CANADA	10,052,302	16,470,417	10,099,404	15,429,900

Table 5 - PRINCIPAL STATISTICS RELATING TO PRODUCTION OF CRUDE PETROLEUM, 1944 (a)

		Ontario	Alberta	Northwest Territories	CANADA
Number of firms		111	112	1	224
Number of active wells (b)		1,690	492	59	2,264(c)
Number of employees—On salary		17	616	246	879
On wages		142	1,284	242	1,668
Total		159	1,900	488	2,547
Salaries and wages—Salaries	$	20,279	1,512,073	718,059	2,050,411
Wages	$	94,350	2,810,085	859,830	3,764,265
Total	$	114,629	4,122,158	1,577,889	5,814,676
Selling value of products (gross)	$	296,420	14,889,351	632,587	15,818,358
Cost of fuel and electricity	$	50,455	970,029	...	1,000,484
Cost of process supplies used	$	6,492	195,819	40,000	242,311
Selling value of products (net)	$	259,473	13,723,503	592,587	14,575,563

(a) Data for New Brunswick are included in the Natural Gas Industry.
(b) Includes wells still drilling and dry wells completed in year specified.
(c) Includes 23 in New Brunswick.

Table 6 - WAGE-EARNERS, BY MONTHS, 1943 and 1944 (Number on pay-roll on the last work day of each month)

Month	1943 Male	1943 Female	1943 TOTAL	1944 Male	1944 Female	1944 TOTAL
January	1,442	6	1,448	1,680	15	1,695
February	1,439	7	1,446	1,629	15	1,644
March	1,508	8	1,516	1,582	15	1,597
April	1,519	8	1,527	1,587	17	1,604
May	1,606	9	1,615	1,664	17	1,681
June	1,624	8	1,632	1,678	17	1,695
July	1,845	10	1,855	1,737	22	1,759
August	1,925	10	1,935	1,687	22	1,709
September	1,879	13	1,892	1,585	21	1,606
October	1,943	21	1,964	1,503	23	1,526
November	1,981	23	2,004	1,538	22	1,560
December	1,931	24	1,955	1,470	21	1,491
AVERAGE	1,736	12	1,748	1,646	22	1,668

Table 7 - HOURS WORKED PER WEEK BY WAGE-EARNERS, 1944 (In one week of month of highest employment; overtime included)

Hours worked per week	Number of Wage-earners		
	Male	Female	TOTAL
30 hours or less	107	2	109
31-43 hours	134	1	135
44 hours	19	...	19
45-47 hours	11	...	11
48 hours	1,165	18	1,183
49-50 hours	108	...	108
51-54 hours	114	...	114
55 hours	2	...	2
56-64 hours	245	1	246
65 hours and over	27	...	27
TOTAL	1,932	22	1,954
Total wages paid during week $	86,926	845	87,771

Table 8 - FUEL AND ELECTRICITY USED IN THE CRUDE PETROLEUM INDUSTRY, 1943 and 1944

Kind	Unit of measure	1943		1944	
		Quantity	Cost	Quantity	Cost
			$		$
Bituminous coal—Canadian	ton	905	4,178	2,665	22,884
Imported	ton	2	19	...	...
Anthracite—From the United States	ton	2	35	4	57
Other	...	...	...	...	...
Lignite coal	ton	17	36	...	...
Coke	ton	...	...	1	15
Gasoline	Imp.gal.	128,521	37,682	276,180	74,515
Kerosene or coal oil	Imp.gal.	2,210	332	1,871	254
Fuel oil and diesel oil	Imp.gal.	151,239	10,452	423,709	23,383
Wood (cords of 128 cubic feet)	cord	245	792	749	2,751
Gas—Natural	M cu.ft.	6,601,392	616,404	7,631,540	839,475
Other	...	...	10,696	...	7,045
Electricity purchased	K.W.H.	2,003,695	29,253	1,800,260	30,125
TOTAL	...	...	709,879	...	1,000,484

Table 9 - POWER EQUIPMENT INSTALLATION IN THE CRUDE PETROLEUM INDUSTRY, 1944

	Ordinarily in Use		In Reserve or Idle	
	Number of units	Total horse power (x)	Number of units	Total horse power (x)
Steam engines	63	25,220	18	1,981
Steam turbines	11	1,150	2	198
Diesel engines	9	1,078	...	...
Gasoline, gas and oil engines, other than Diesel engines	87	2,681	28	306
Hydraulic turbines or water wheels	...	...	...	...
Electric motors—(a) Operated by purchased power	160	1,228	17	372
Total	330	31,337	65	2,857
(b) Operated by power generated by the establishment	2	2	...	...
Stationary boilers	98	8,683	11	425
Motor generator sets	9	515	...	...

(x) According to manufacturers' rating.

Table 10 - IMPORTS INTO CANADA OF PETROLEUM, ASPHALT AND THEIR PRODUCTS, 1943 and 1944

Item		1943 Quantity	1943 Value	1944 Quantity	1944 Value
			$		$
Asphaltum or asphalt, solid or not	cwt.	149,657	291,186	121,064	518,308
Oil, imported by miners or mining companies, for the concentration or ores or metals	gal.	68,473	46,759	83,192	54,249
Crude petroleum for refining .8155 specific gravity (42.0 A.P.I.) or heavier at 60° Fah.	M gal.	1,739,505	66,305,137	1,996,445	71,934,216
Crude petroleum for refining, lighter than .8155 specific gravity (42.0 A.P.I.) at 60° Fah.	gal.	...	...	2,295	97
Crude petroleum, n.o.p.	gal.	1,877,950	78,649	227,218	9,105
Fuel oil, ex-warehoused, for ships' stores	gal.	27,816,694	906,568	23,215,553	1,050,184
Coal oil and kerosene lighter than .8236 specific gravity at 60° Fah. n.o.p.	gal.	10,692,591	673,080	8,890,511	581,669
Engine distillate .8017 specific gravity or heavier at 60° Fah.	gal.	596,503	41,959	474,253	33,965
Gasoline, lighter than .8236 specific gravity at 60° Fah.	gal.	70,500,782	10,052,251	67,498,115	11,415,619
Natural casinghead, compression or absorption gasoline lighter than .6690 specific gravity (80.0 A.P.I.) at 60° Fah. when imported by refiners of crude petroleum for blending with gasoline wholly produced in Canada	gal.	27,004,010	1,906,482	23,902,460	1,771,836
Lubricating oils, composed wholly or in part of petroleum and costing less than 25 cents per gallon	gal.	8,098,301	1,431,157	7,475,273	1,300,413
Lubricating oils n.o.p.	gal.	5,383,999	2,977,951	6,217,714	3,151,929
All other oils n.o.p.	gal.	384,534	462,299	1,713,954	987,065
Imports of petroleum n.o.p., .8236 specific gravity (40.3 A.P.I.) or heavier at 60° Fah.	gal.	53,570,321	2,066,407	63,323,016	2,561,065
Petroleum greases and lubricating greases n.o.p.	lb.	10,291,447	687,555	10,516,483	669,316
Refined petroleum jellies and oils for toilet, medicinal, edible or similar purposes	...	...	498,071	...	460,419
Paraffin wax	lb.	20,743,199	1,309,089	17,564,432	1,142,662
Paraffin wax candles	lb.	116,089	25,441	138,468	34,300
Products of petroleum n.o.p. lighter than .8236 specific gravity at 60° Fah.	gal.	1,184,055	157,411	1,300,046	157,944
Liquefied petroleum gases	...	...	191,226	...	342,648

Table 11 - EXPORTS OF PETROLEUM AND ITS PRODUCTS FROM CANADA, 1943 and 1944

Item		1943 Quantity	1943 Value	1944 Quantity	1944 Value
			$		$
Petroleum, crude	gal.	...	...	...	...
Oil, coal and kerosene, refined	gal.	1,004,659	115,484	1,036,227	117,666
Gasoline and naphtha	gal.	16,316,270	3,119,194	22,817,385	5,706,320
Fuel oil	gal.	54,687,171	3,681,177	46,794,915	2,927,303
Lubricating oil (from January 1, 1944)	gal.	...	...	697,710	213,706
Oil, mineral, n.o.p. (including lubricating oil prior to 1944)	gal.	2,200,684	429,941	465,790	83,263
Wax, mineral	cwt.	48	575	1,145	8,411

OIL SHALE

(Bureau of Mines, Ottawa)

There are large deposits of oil shale in different parts of Canada, the best known occurrences being in Pictou and Antigonish counties, Nova Scotia, and Albert and Westmorland counties, New Brunswick. As shale oil cannot compete with petroleum at present prices, none of these deposits has been actively developed on a commercial scale.

No production has been reported for a number of years and no oil shale is being imported into Canada.

Experimental plants were erected in 1928-30 near Rosevale, New Brunswick, and New Glasgow, Nova Scotia, to treat local shales but they operated only for short periods.

For many years the large-scale production of oil shale was confined to Scotland, but deposits in Manchuria and Esthonia were being developed in 1938 on a large scale. The production of these countries in 1938 was: Scotland, 1,551,346 tons; Esthonia, 1,450,385 tons; and Manchuria, approximately 3,000,000 tons. In 1939 South Africa is reported to have produced 3,000,000 gallons of shale oil. In Australia the Federal and New South Wales Governments are reported to be giving considerable assistance to the shale oil industry, the production in 1942 being 1,600,000 gallons of shale oil.

A large amount of investigational work has been carried out by the Bureau of Mines, Ottawa, including the determination of the petroleum content of representative samples from various localities; the determination of important factors affecting the recovery of crude petroleum by destructive distillation and of the character of the petroleum recovered; and the investigation of the process designed for the distillation of oil shale.

In 1942, the Mines and Geology Branch, Department of Mines and Resources, Ottawa, drilled some of the oil shale deposits in New Brunswick to determine their possibilities as a source of oil and lubricants under war conditions. A total of 43 holes were drilled in oil shale deposits in the Rosevale area and in the vicinity of Taylor Village, New Brunswick; 36 holes were also drilled in deposits at Albert Mines, New Brunswick. The conclusion was reached after assaying more than 3,300 samples, that the over-all grade of the shales in the areas mentioned is too low to be of economic interest even under present conditions.

Owing to the depletion of petroleum reserves, interest has been renewed in oil shale in the United States. It is announced that the U.S. Bureau of Mines is building an oil shale research and development laboratory at the University of Wyoming at Laramie. A site has also been selected, in Colorado, for an oil shale demonstration plant to cost $1,500,000.

THE CANOL PROJECT, 1945

(Lands, Parks and Forests Branch, Department of Mines & Resources, Ottawa)

Production of crude petroleum in the Northwest Territories showed a sharp decline following suspension of activities associated with the Canol Project. On March 8, 1945, the United States Government ordered its agent, Imperial Oil, Limited, to discontinue all drilling and production on Canol account. The pumping of crude oil through the Canol pipeline from Norman Wells to Whitehorse, Y.T., and operation of the refinery at Whitehorse were discontinued about April 1, 1945. The Canol Project agreement was officially terminated on May 3, 1945.

A considerable quantity of crude petroleum and refined products in storage at Norman Wells, the property of the United States Government, was still on hand when the Canol Project ended. These refined products and crude stock were turned back to Imperial Oil, Limited. As a result, there was no necessity to operate the Norman Wells refinery until the late summer of 1945. The production of crude oil was also limited to a quantity sufficient to supply gas for the domestic requirements of the Norman Wells camp.

A total of 63 wells was drilled in the vicinity of Norman Wells under the Canol Project. Of these 60 were commercial producers. These wells were in addition to four pre-Canol wells developed by Imperial Oil, Limited, prior to 1942. In addition, four wildcat wells were drilled for Canol Project some distance from the proven field in an attempt to discover new pools, but were abandoned as dry holes.

Total oil production for the period in which the Canol Project operated--May, 1942 to March 8, 1945--was 1,858,447 barrels. Prior to 1942 a total of 118,895 barrels had been produced. Production for the period March 9, 1945 to August 31, 1945 was 55,947 barrels. The latest estimate of the recoverable reserve of the Norman oilfield, made in 1945, is 56,250,000 barrels.

DIRECTORY

CRUDE OIL PRODUCERS IN CANADA, 1944

Name	Address	Location—Field
New Brunswick -		
New Brunswick Gas & Oilfields Ltd.	Moncton	Stoney Creek
Ontario (x) -		
Barnes, Amos	Petrolia	Petrolia and Enniskillen
Barnes, Henry	Oil Springs	Petrolia and Enniskillen
Beattie, James and John	Glencoe	Warwick
Brock, Thomas	Petrolia	Petrolia and Enniskillen
Byers Bros.	Oil Springs	Petrolia and Enniskillen
Cole, W. J.	Petrolia	Petrolia and Enniskillen
Collins, Matthew	Petrolia	Petrolia and Enniskillen
Corey Oil & Supply Co.	Petrolia	Petrolia and Enniskillen
Dennis, Lavina	Oil Springs	Petrolia and Enniskillen
Domestic Gas & Oil Co. Ltd.	Blyth	Bothwell
Dominion Petroleum Co.	Glencoe	Mosa
Donald, George	Oil Springs	Petrolia and Enniskillen
Eastern Trust Co.	Toronto	Dunwich
Edward, F. H.	Petrolia	Petrolia and Enniskillen
Fairbank, John H., Estate	Petrolia	Petrolia and Enniskillen
Fitzpatrick, P. H.	2230 Park Ave., Detroit, Mich., U.S.A.	Orford
Garinger, Arthur	Oil Springs	Petrolia and Enniskillen
Graff, George I.	25 Market Place, Stratford	Bothwell
Hamlin, F. G.	Petrolia	Petrolia and Enniskillen
Heal, Andrew A.	Watford	Warwick
High Grade Natural Gas Co.	215 King St., Chatham	Dover
Hillis, F. E.	Oil Springs	Petrolia and Enniskillen
Holmes, E. B. (/)	Bothwell	Bothwell
Howlett, F. W. & Sons	Petrolia	Petrolia and Enniskillen
Kells, E.E.	Petrolia	Petrolia and Enniskillen
Kelly, J. E.	Petrolia	Petrolia and Enniskillen
Kent Oil Syndicate	Bothwell	Bothwell
Kerr, John, Estate	Petrolia	Petrolia and Enniskillen
Lather, Arthur	Bothwell	Bothwell
Lennan, L. A.	Box 514, Petrolia	Petrolia and Enniskillen
Leverton, Wm.	Bothwell	Bothwell
Lewis, Laura and William	Oil Springs	Petrolia and Enniskillen
Lidster, Harold	Wallacetown	Dunwich
Longwood Syndicate	Chatham	Zone
MacGillivray, Mrs. Margaret A.	Oil Springs	Petrolia and Enniskillen
Marcus, A.	Bothwell	Bothwell
McCutcheon, A. P.	Oil Springs	Petrolia and Enniskillen
McGill, Joseph	Bothwell	Bothwell
McMillan, Duncan C.	Bothwell	Bothwell
McMillan & Warwick	Bothwell	Bothwell
Mitchell, Charles	Oil Springs	Petrolia and Enniskillen
Mitchell, Robert	Oil Springs	Petrolia and Enniskillen
Morningstar, George E.	Oil Springs	Petrolia and Enniskillen
Morningstar, H. M.	Oil Springs	Petrolia and Enniskillen
Ontario Lands & Oil Co.	Petrolia	Petrolia and Enniskillen
Petrol Oil & Gas Co.	414 Bay St., Toronto	Dover
Pope, Harry O.	Bothwell	Bothwell
Pope, William Jr.	Bothwell	Bothwell
Prairie Gas & Oil Co.	350 Bay St., Toronto	Dover
Rowe, E. P. Estate	350 Bay St., Toronto	Dover and Raleigh
Saroline Oil Co.	Petrolia	Petrolia and Enniskillen
Shain, Viola May	R.R. 5, Petrolia	Petrolia and Enniskillen
Slack, Charles	Box 863, Petrolia	Petrolia and Enniskillen
Sutherland, Bloss M.	Petrolia	Petrolia and Enniskillen

Directory

Crude Oil Producers in Canada, 1944

(Continued)

Name	Address	Location—Field
Ontario (Con.) -		
Thompson, Arnold	Petrolia	Petrolia and Enniskillen
Tunks, James	Bothwell	Bothwell
Union Gas Co. of Canada Ltd.	Gas Bldg., Fifth St., Chatham	Dawn, Raleigh and Zone
Warwick, Joseph	Oil Springs	Petrolia and Enniskillen
Wilson & Sullivan	Sarnia	Adelaide, Brooke and Warwick
Winnett, J. W. G.	418½ Talbot St., London	Bothwell and Warwick
Woodward, Wm.	Oil Springs	Petrolia and Enniskillen
Yerks, Frank	Petrolia	Petrolia and Enniskillen and Warwick

(x) Producers of 500 barrels or more during the year.
(/) Producer and driller.

Alberta -		
Abasand Oils Ltd.	Credit Foncier Bldg., Edmonton	Fort McMurray
Ace Royalties Ltd.	4 Clarence Block, 122-8th Ave., Calgary	Turner Valley
Advance Oil Co. Ltd.	232 Lougheed Bldg., Calgary	Turner Valley
Alberta Oil Incomes Ltd.	301 Lancaster Bldg., Calgary	Turner Valley
Alberta Pacific Royalties Ltd.	201 Lancaster Bldg., Calgary	Turner Valley
Allied Royalties Ltd.	201 Lancaster Bldg., Calgary	Turner Valley
Amalgamated Oils Ltd.	902 Lancaster Bldg., Calgary	Turner Valley
Anglo Canadian Oil Co. Ltd.	902 Lancaster Bldg., Calgary	Turner Valley
Argus Royalties Ltd.	900 Lancaster Bldg., Calgary	Turner Valley
Arrow Oil Royalties Ltd.	804 Southam Bldg., Calgary	Turner Valley
Associated Oil & Gas Co. Ltd.	200 Leeson-Lineham Block, Calgary	Turner Valley
Baltac Oils Ltd.	200 Leeson-Lineham Block, Calgary	Turner Valley
Barsac Royalties Ltd.	303 Toronto General Trusts Bldg., Calgary	Turner Valley
Bethwain Oils Ltd.	73 Adelaide St. W., Toronto, Ont.	Wainwright
Borradaile Oils Ltd.	330 Bay St., Toronto, Ont.	Vermilion
British American Oil Co. Ltd. (b)	Royal Bank Bldg., King & Yonge Sts., Toronto, Ont.	...
British Colonial Oils Ltd.	1010 Lancaster Bldg., Calgary	Turner Valley
British Dominion Oil & Development Corp. Ltd.	213-216 Dominion Bank Bldg., Calgary	Turner Valley
British Empire Oil & Development Co. Ltd.	401 Leeson-Lineham Block, Calgary	Turner Valley
California Standard Co.	700 Lancaster Bldg., Calgary	Conrad and Princess
Calmont Oils Ltd.	303 Toronto General Trusts Bldg., Calgary	Turner Valley
Calwin Royalties Ltd.	301 Lancaster Bldg., Calgary	Turner Valley
Canadian Transport Ltd.	Vermilion	Vermilion
Cannar Oils Ltd.	360 McGill St., Montreal, Que.	Vermilion
Carleton Royalties Ltd.	102 Bank of Commerce Chambers, Calgary	Turner Valley
Chinook Oils Ltd.	232 Lougheed Bldg., Calgary	Turner Valley
Coastal Oils Ltd.	232 Lougheed Bldg., Calgary	Turner Valley
Command Oils Ltd.	4 Clarence Block, 122-8th Ave. W., Calgary	Turner Valley
Commoil Ltd.	4 Clarence Block, 122-8th Ave. W., Calgary	Turner Valley
Commonwealth Drilling Co. Ltd. (a)	4 Clarence Block, 122-8th Ave. W., Calgary	...
Conestoga Resources Ltd.	710 Excelsior Life Bldg., Toronto, Ont.	Vermilion
Crest Royalties Ltd.	201 Lancaster Bldg., Calgary	Turner Valley
Crude Oils Ltd.	501 Leeson-Lineham Bldg., Calgary	Turner Valley
D & D Royalties Ltd.	303 Toronto General Trusts Bldg., Calgary	Turner Valley
Dalhousie Oil Co. Ltd.	604-606 Second St. W., Calgary	Turner Valley
Davies Petroleums Ltd. N.P.L.	409 Lancaster Bldg., Calgary	Turner Valley
Deep Oils Ltd.	501 Leeson-Lineham Bldg., Calgary	Turner Valley
Dominion Oil Co. Ltd.	906 Marine Bldg., Vancouver, B.C.	Taber
Drillers & Producers Ltd.	337-8th Ave. W., Calgary	Turner Valley

Directory
Crude Oil Producers in Canada, 1944
(Continued)

Name	Address	Location—Field
Alberta (Con.) -		
East Crest Oil Co. Ltd.	212 Grain Exchange Bldg., Calgary	Turner Valley
Edmonton-Wainwright Oils Ltd.	8 McDougal Court, Edmonton	Wainwright
Extension Oil Royalties Ltd.	902 Lancaster Bldg., Calgary	Turner Valley
Federated Petroleums Ltd.	232 Lougheed Bldg., Calgary	Turner Valley
Foothills Oil & Gas Co. Ltd.	604-606 Second St. W., Calgary	Turner Valley
Four Star Petroleums Ltd.	232 Lougheed Bldg., Calgary	Turner Valley
Franco Oils Ltd.	Vermilion	Vermilion
Gas & Oil Refineries Ltd. (b)	301 Lancaster Bldg., Calgary	...
Gem Royalties Ltd.	403 Lancaster Bldg., Calgary	Turner Valley
Granville Oils Ltd.	4 Clarence Block, 122-8th Ave. W., Calgary	Turner Valley
Great Bend	National Trust Bldg., Edmonton	Vermilion
Harris Co. Ltd.	201 Lancaster Bldg., Calgary	Turner Valley
Highwood-Sarcee Oils Ltd.	614 Lancaster Bldg., Calgary	Turner Valley
Hollingsworth Oils Ltd.	210 Toole Peet Bldg., Calgary	Vermilion
Home Oil Co. Ltd.	226 Lougheed Bldg., Calgary	Turner Valley
Imperial Oil Ltd.	604-606 Second St. W., Calgary	Turner Valley
Independent Royalties Ltd.	403 Lancaster Bldg., Calgary	Turner Valley
Kamalta Well Operators Ltd.	201 Lancaster Bldg., Calgary	Turner Valley
Lion Producing Co. Ltd.	328a .. 8th Ave. W., Calgary	Turner Valley
Major National Oils Ltd.	407 Lancaster Bldg., Calgary	Turner Valley
Major Oil Ltd.	403 Lancaster Bldg., Calgary	Taber
Major Oil Investments Ltd.	407 Lancaster Bldg., Calgary	Turner Valley
McDougall-Segur Exploration Company of Canada Ltd.	405-8th Ave. W., Calgary	Turner Valley
Mercury Oils Ltd.	301 Lancaster Bldg., Calgary	Turner Valley
Miracle Oils Ltd.	301 Lancaster Bldg., Calgary	Turner Valley
Miracle Royalties Ltd.	301 Lancaster Bldg., Calgary	Turner Valley
Model Oils Ltd.	201 Lancaster Bldg., Calgary	Turner Valley
Moose Oils Ltd.	714 Lancaster Bldg., Calgary	Moose Dome
National Drilling Co. Ltd.	401 Leeson-Lineham Bldg., Calgary	Turner Valley
National Petroleum Corp.	401 Leeson-Lineham Bldg., Calgary	Turner Valley
National Vulcan Royalties	401 Leeson-Lineham Bldg., Calgary	Turner Valley
Newell & Chandler Ltd. (a)	337-8th Ave. W., Calgary	...
Northclonmel Royalties Ltd.	330 Bay St., Toronto, Ont.	Turner Valley
Oil Ventures Ltd.	501 Leeson-Lineham Block, Calgary	Turner Valley
Okalta Oils Ltd.	Renfrew Bldg., Calgary	Turner Valley
Pacific Petroleums Ltd.	501 Leeson-Lineham Block, Calgary	Turner Valley
Princeville Petroleums Ltd.	720 Stock Exchange Bldg., Vancouver, B.C.	Vermilion
Ram River Oils Ltd.	728 Tegler Bldg., Edmonton	Ram River
Regal Royalties Ltd.	401 Leeson-Lineham Block, Calgary	Turner Valley
Renown Royalties Ltd.	201 Lancaster Bldg., Calgary	Turner Valley
Reward Spooner Model Ltd.	717 Lancaster Bldg., Calgary	Turner Valley
Royal Canadian Oils Ltd.	403 Lancaster Bldg., Calgary	Turner Valley
Royal Crest Petroleums Ltd.	232 Lougheed Bldg., Calgary	Turner Valley
Royalite Oil Co. Ltd. (c)	604-606 Second St. W., Calgary	Turner Valley
Royalite Model #1 Well	201 Lancaster Bldg., Calgary	Turner Valley
Saskahead Oils Ltd.	Indian Head, Sask.	Vermilion
Sasko-Wainwright Oil & Gas Ltd.	103 Bowerman Bldg., Saskatoon, Sask.	Wainwright
Share Royalties Ltd.	61 Canada Life Bldg., Calgary	Turner Valley
Shaw, R. L.	Box 37, Lloydminster, Sask.	Lloydminster
Southwest Petroleum Co. Ltd.	604-606 Second St. W., Calgary	Turner Valley
Sovereign Royalties Ltd.	317 Alberta Corner, Calgary	Turner Valley
Standard Oil Company of British Columbia Ltd.	906 Marine Bldg., Vancouver, B.C.	Taber
Sunburst Oil Co. Ltd.	800 Lancaster Bldg., Calgary	Turner Valley
Sunset Oils Ltd.	302 Toronto General Trusts Bldg., Calgary	Turner Valley
Three Point Petroleums Ltd.	232 Lougheed Bldg., Calgary	Turner Valley
Turner Valley Royalties Ltd.	232 Lougheed Bldg., Calgary	Turner Valley

Directory

Crude Oil Producers in Canada, 1944

(Concluded)

Name	Address	Location—Field
Alberta - (Con.)		
Twin Valley Oil Royalties Ltd.	804 Southam Bldg., Calgary	Turner Valley
United Assets Ltd.	232 Lougheed Bldg., Calgary	Turner Valley
Vanalta Ltd.	618-744 West Hastings St., Vancouver, B.C.	Red Coulee
Vanpeg Royalties Ltd.	301 Lancaster Bldg., Calgary	Turner Valley
Vulcan-Brown Petroleums Ltd.	232 Lougheed Bldg., Calgary	Turner Valley
Wain-Con Oils Ltd.	431 Tegler Bldg., Edmonton	Wainwright
Wainwright Petroleums Ltd.	10625—99 Ave., Edmonton	Wainwright
Western Petroleum Operators Ltd.	407 Lancaster Bldg., Calgary	Turner Valley
Westside Royalties Ltd.	232 Lougheed Bldg., Calgary	Turner Valley
Winalta Royalties Ltd.	301 Lancaster Bldg., Calgary	Turner Valley
York Oils Ltd.	501 Leeson-Lineham Block, Calgary	Turner Valley
Northwest Territories -		
Imperial Oil Ltd. (Canol Project)	56 Church St., Toronto, Ont.	Fort Norman
Imperial Oil Ltd. (Norman Wells)	56 Church St., Toronto, Ont.	Fort Norman

(a) Drilling only.
(b) Operates an absorption plant.
(c) In addition to operating and drilling wells in the Turner Valley field, this company operates an absorption plant.

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