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THE FELDSPAR AND QUARTZ MINING INDUSTRY 1960

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SYMBOLS

The interpretation of the symbols used in the tables throughout this publication is as follows:

- .. figures not available.
- ... figures not appropriate or not applicable.
- nil or zero.

THE FELDSPAR AND QUARTZ MINING INDUSTRY

1960

The Feldspar and Quartz Mining Industry is part of Other Non-metal Mines—079—Standard Industrial Classification.

Owing to the very close physical association of feldspar and quartz in many Canadian deposits (pegmatites), it is difficult for some operators to make a separation of all data pertaining to the mining of each individual mineral; for this reason, the general statistics relating to employment, fuel and electricity, etc., have been combined in this report. Since 1936 corresponding statistics relating to the production of nepheline syenite have been included with those pertaining to the commercial production of feldspar and quartz.

Quebec produced feldspar; nepheline syenite output came from Ontario only; quartz (silica) in various forms was produced in Nova Scotia, Quebec, Ontario, Manitoba, Saskatchewan and British Columbia.

Employed in the industry were 450 persons to whom \$1,815,822 were distributed as salaries and wages. Fuel cost \$163,882 and 20,181,129 kwh. of electricity were purchased for \$180,986. Process supplies, containers and freight amounted to \$778,525.

TABLE 1. Principal Statistics of the Feldspar and Quartz Mining Industry¹
Significant Years, 1921 - 60

Year	Establishments ²	Employees	Salaries and wages	Cost of fuel and electricity at works	Cost of process supplies and containers at works	Gross selling value of products (f.o.b. works)	Net value of production ³
			number			dollars	
1921	31	244	166,253	20,212	..	543,701	..
1929	40	488	353,891	41,462	..	901,998	..
1931	36	166	135,809	20,996	..	490,119	..
1933	28	146	117,037	26,327	..	402,937	..
1937	39	445	384,698	82,611	103,859	1,428,714	1,242,244
1939	43	338	330,170	79,114	99,607	1,352,671	1,173,950
1941	38	506	610,489	91,165	159,818	1,838,054	1,587,071
1944	41	529	772,385	166,501	241,400	2,104,030	1,636,093
1946	30	517	876,034	161,208	180,207	2,168,673	1,727,972
1949	27	442	946,268	146,379	216,206	2,650,035	2,184,782
1950	33	476	1,056,129	179,445	173,123	3,021,555	2,553,587
1951	30	532	1,402,294	263,586	318,493	3,926,523	3,184,952
1954	28	377	1,193,766	204,695	290,080	3,662,181	3,107,993
1956	30	502	1,792,484	352,067	309,799	6,017,744	5,258,255
1957	28	450	1,737,907	373,304	556,356	6,495,258	5,310,235
1958	35	450	1,804,827	389,008	617,720	5,555,582	4,382,352
1959	38	509	2,079,284	421,623	753,378	6,798,366	5,397,136
1960	34	450	1,815,822	344,868	615,133	6,519,961	5,396,568

¹ Includes nepheline syenite.

² Small shippers, whose production is recorded from consumers' returns, are sometimes not included in the total.

³ Gross value less cost of fuel, electricity, process supplies, containers and freight.

TABLE 2. Employees and their Earnings in the Feldspar and Quartz Mining Industry, 1956 - 60

Year	Employees					Man-hours worked (all employees)	Earnings			
	Office and administrative		Workmen				Office and administrative	Workmen	Total	
	Male	Female	Male	Female	Total					
	number						dollars			
1956	56	12	428	6	502	1,152,215	404,071	1,388,413	1,792,484	
1957	85	9	355	1	450	980,825	468,259	1,269,648	1,737,907	
1958	66	9	374	1	450	959,688	385,732	1,419,095	1,804,827	
1959	82	10	411	6	509	1,178,799	512,815	1,566,469	2,079,284	
1960	85	8	354	3	450	984,819	455,993	1,359,829	1,815,822	

TABLE 3. Number of Workmen, by Months, 1959 and 1960

Month	1959 Total	1960						Total	
		Surface		Underground		Mill			
		Male	Female	Male	Male	Female			
January	338	100	—	12	171	1	284		
February	345	93	—	11	168	1	273		
March	360	91	—	11	175	1	278		
April	377	127	—	16	175	1	319		
May	461	163	—	17	190	3	373		
June	468	178	—	18	193	3	392		
July	505	188	—	17	198	3	406		
August	495	182	1	19	191	1	394		
September	453	200	1	16	195	1	413		
October	442	196	1	15	196	1	409		
November	403	154	1	13	199	1	368		
December	301	119	—	14	198	1	332		
Averages	417	149	1	15	190	2	357		
Man-hours worked	960,585						797,781		

TABLE 4. Fuel and Electricity Used in the Feldspar and Quartz Mining Industry, 1960

Kind	Quantity	Cost at plant
		\$
Bituminous coal (a) From Canadian Mines	—	—
(b) Imported	—	—
Sub-bituminous coal (from Alberta mines only)	—	—
Anthracite coal	short ton	5 140
Lignite coal	—	—
Coke (for fuel only)	short ton	10 200
Gasoline, (includes gasoline used in cars and trucks)	Imp. gal.	113,977 44,659
Kerosene or coal oil	—	—
Fuel oil	Imp. gal.	734,623 117,953
Wood (cords of 128 cubic feet of piled wood)	cord	15 200
Gas (a) Liquefied petroleum gases (propane, etc.)	Imp. gal.	2,098 730
(b) Other manufactured gas	—	—
(c) Natural gas	—	—
Other fuel	—	—
Electricity purchased for power and lighting	kwh.	20,181,129 180,986
Electricity purchased for other purposes	—	—
Total (cost only) .....	...	344,868
Electricity generated (a) For own use	kwh.	13,000 ...
(b) For sale	—	—

FELDSPAR

Feldspar shipments in 1960 amounted to 13,862 tons valued at \$239,273 compared with 17,953 tons valued at \$301,372. During the past six years all of the feldspar shipped was mined in Quebec.

The greater of the production of feldspar is used in the pottery, glass, enamelware, and other ceramic trades, and the remainder mainly in scouring soaps and cleansers and for bonding of fired abrasive wheels and other shapes. Some coarsely-crushed spar, usually made from impure waste or quarry fines, is sold for stucco dash, artificial

stone, chicken grit, etc. Small tonnages of specially selected crude (dental spar) are used in the manufacture of artificial teeth, and such material commands a larger premium.

Most of the feldspar used is of the high-potash type, though some high-soda spar is used for blending purposes and in low-fired enamels and glazes. Practically all colours are equally acceptable for ceramic uses, but for cleanser purposes the pale shades of white to buff are demanded.

TABLE 5. Producers' Shipments of Feldspar, Crude and Ground, by Provinces, 1951-60

Year	Quebec		Ontario		Canada	
	Tons	Value	Tons	Value	Tons	Value ¹
1951	28,000	\$ 425,370	12,749	\$ 125,727	40,749	\$ 551,097
1952	16,645	293,007	3,622	37,628	20,267	330,635
1953	18,591	319,146	2,655	28,018	21,246	347,164
1954	14,305	278,997	1,791	22,052	16,096	301,049
1955	18,152	355,879	—	—	18,152	355,879
1956	18,153	364,849	—	—	18,153	364,849
1957	20,450	393,284	—	—	20,450	393,284
1958	20,387	359,966	—	—	20,387	359,966
1959	17,953	301,372	—	—	17,953	301,372
1960	13,862	239,273	—	—	13,862	239,273

¹ Excluding the value of containers.

TABLE 6. Consumption of Feldspar, 1955-59

	1955	1956	1957	1958	1959
tons					
(a) By uses					
Glass	4,612	4,993	5,316	974	2,853
Scouring powders, cleansers	1,399	1,385	1,371	422	594
Abrasives	11	13	...	...	...
Clay products (pottery, tile, Insulators, etc.)	5,839	6,356	6,297	7,723	6,229
Enamelling	874	941	...	...	...
Heating and cooking apparatus	166	...	...	...	...
Iron castings	22	...	...	...	...
Electrical apparatus	767	743	...	...	473
Miscellaneous non-metallics .....	...	1	974	753	833
Total accounted for	13,690	14,432	13,958	9,872	10,982
(b) By provinces					
Quebec	6,975	7,013	7,892	3,938	5,412
Ontario	6,532	7,295	6,064	5,134	4,857
Alberta	183	120	1	87	—
British Columbia	—	4	1	713	713
Canada	13,690	14,432	13,958	9,872	10,982

TABLE 7. Imports and Exports of Feldspar, 1958-60

	1958		1959		1960	
	Tons	Value	Tons	Value	Tons	Value
Imports:		\$		\$		\$
Feldspar	1,140	22,753	1,161	23,067	1,338	27,545
Exports:						
Feldspar	9,956	160,621	7,552	115,111	3,183	73,811

TABLE 8. World Production of Feldspar, by Countries¹
(Taken from the "Minerals Yearbook" published by the United States Bureau of Mines)

Country ¹	1955	1956	1957	1958	1959
long tons ²					
North America:					
Canada (sales)	16,207	16,208	18,259	18,203	15,859
United States (sold or used)	550,861	560,074	498,057	469,738	548,390
Totals	567,068	576,282	516,316	487,941	564,249
South America:					
Argentina	4,501	7,999	4,271	3,621	3,900 ³
Brazil	—	—	—	—	—
Chile	821	826	369	400	400 ³
Columbia	—	—	—	3,937	9,800 ³
Uruguay	381	—	168	267	352
Totals ³	19,000	22,000	18,000	21,000	27,000
Europe:					
Austria	2,510	2,677	2,612	2,613	3,445
Finland	12,529	8,799	9,055	13,188	8,191
France	71,847	75,966	65,224	81,104	83,700 ³
Germany, West	163,599	164,166	188,269	187,504	186,011
Italy	52,097	50,479	63,969	55,198	60,443
Norway	39,434	52,437	55,423	64,800	64,000 ³
Portugal	592	912	1,161	544	590 ³
Spain	5,041	3,524	4,472	5,199	4,900 ³
Sweden	50,639	52,500	52,968	43,709	44,000 ³
Yugoslavia	—	5,476	9,608	12,466	19,309
Totals ^{1,3}	405,000	420,000	460,000	470,000	480,000
Asia:					
Hong Kong	120	60	1,156	1,653	1,716
India	5,230	3,263	7,872	8,432	9,740
Japan ⁴	30,587	58,665	43,417	44,507	44,000 ³
Phillippines	—	—	49	74	1,684
Vietnam, South	1,880	2,000 ³	2,000 ³	2,000 ³	2,000 ³
Totals	37,817	53,988	54,494	56,666	59,000 ³
Africa:					
Eritrea	12	12	394	413	400 ³
Kenya	—	—	120	26	—
Madagascar	—	203	—	—	—
Rhodesia and Nyasaland Federation of:					
Southern Rhodesia	—	—	—	447	—
Union of South Africa	4,621	9,730	11,381	7,708	10,447
Totals	4,633	9,945	11,895	8,594	10,847
Oceania:					
Australia ⁵	20,833	18,629	8,820	7,016	5,700 ³
World totals (estimate) ^{1,2}	1,050,000	1,100,000	1,070,000	1,050,000	1,150,000

¹ In addition to countries listed, feldspar is produced in China, Czechoslovakia, Rumania and U.S.S.R., but data are not available; no estimates are included in the total except for Czechoslovakia.² This table incorporates a number of revisions of data published in previous feldspar chapters.³ Estimate.⁴ In addition, the following quantities of aplite and other feldspathic rock were produced: 1954, 74,817 tons; 1955, 66,291 tons; 1956, 63,723 tons; 1957, 82,670 tons; 1958, 76,856 tons; 1959, 91,559 tons.⁵ Includes some china stone.

NEPHELINE SYENITE

Nepheline syenite shipped by Canadian producers in 1960 amounted to 240,636 tons valued at \$2,891,095 compared with 228,722 tons valued at \$2,930,932 in the preceding year. All of Canada's output of nepheline syenite was mined in the Blue Mountain area, Peterborough county, Ontario, by two firms, the American Nepheline Limited and the International Minerals and Chemical Corporation (Canada) Limited.

Nepheline syenite is a quartz-free crystalline rock consisting principally of nephelite (a silicate of alumina, potash, and soda), albite, and microcline feldspar. To be of commercial interest it must be amenable to treatment for the removal of iron-bearing impurities such as magnetite, biotite, hornblende, and tourmaline, so that the iron-oxide Fe_2O_3 content can be reduced to under 0.08 per cent. Finely divided iron impurities frequently cannot be removed by dry milling methods, and render otherwise promising deposits of nepheline syenite useless for commercial operation.

Specifications for glass-grade nepheline syenite call for all minus 28 mesh material, and, for pottery grade, all through 200 mesh or finer. High-intensity magnetic separation reduces the iron-oxide content from about 1.50 per cent in the feed to under 0.08 per cent in the finished product. Dry milling methods are used throughout the processing.

Nepheline syenite finds wide use in the ceramic industry where it replaces feldspar as a source of alumina and the alkalis in making glass, pottery, floor and wall tile, refractory cements, whiteware and porcelain products, enamels, and varied ceramic products. The lower fusibility and greater fluxing action of nepheline syenite as compared with that of the traditional vitrifying agents enables a manufacturer to either fire the ware at lower temperature or use a reduced amount of vitrifying agent and still attain the desired properties. In glass batches, the low iron content (0.06 to 0.08 per cent Fe_2O_3) of nepheline syenite, combined with its high alumina and alkali content, make it a desirable means of introducing alumina, especially where low iron is important.

TABLE 9. Producers' Shipments of Nepheline Syenite, 1951-60

Year	Quantity	Selling value, f.o.b. shipping point	Year	Quantity	Selling value, f.o.b. shipping point
	tons	\$		tons	\$
1951	81,108	1,114,943	1956	180,006	2,574,140
1952	82,681	1,111,950	1957	200,016	2,754,060
1953	113,345	1,576,271	1958	201,306	2,613,446
1954	123,669	1,770,528	1959	228,722	2,930,932
1955	146,068	2,099,512	1960	240,636	2,891,095

¹ Value of containers excluded.

TABLE 10. Consumption of Ground Nepheline Syenite, 1955-59

	1955	1956	1957	1958	1959
tons					
(a) By uses					
Glass and glass wool	13,814	16,330	15,806	19,279	21,722
Clay products	1,520	2,008	2,345	2,579	3,136
Stone products	3,362	6,679	5,227	4,886	5,350
Total accounted for	18,696	25,017	23,378	26,744	30,208
(b) By provinces					
Quebec	4,370	4,620	4,347	7,547	6,672
Ontario	11,792	17,122	15,249	16,067	19,974
Other	2,534	3,275	3,782	3,130	3,562
Total accounted for	18,696	25,017	23,378	26,744	30,208

TABLE 11. Exports of Nepheline Syenite, 1951-60

Year	Quantity	Value		Year	Quantity	Value
	tons	\$			tons	\$
1951	59,777	857,236	1956	139,305	1,935,315	
1952	56,323	802,376	1957	164,342	2,235,843	
1953	76,375	1,120,781	1958	160,081	2,098,421	
1954	83,952	1,269,098	1959	178,120	2,345,341	
1955	118,275	1,753,117	1960	193,298	2,373,354	

QUARTZ (SILICA)

Shipments of quartz or siliceous material during 1960 amounted to 2,260,766 tons valued at \$3,266,705 compared with 2,163,546 tons worth \$3,436,730 shipped in the preceding year. The production included crude and crushed quartz, quartzite and sandstone, as well as natural silica sands and gravels which were used as fluxes. Shipments were made from a quartz crystal deposit near Lynhurst, Ontario.

In Nova Scotia shipments of silica were made to steel plants chiefly for use in making silica brick; there were also shipments of moulding sand.

In Quebec substantial tonnages of silica rock were crushed and screened for use in the manufacture of ferrosilicon or further milled to produce sand for silicon carbide. In Ontario most of the shipments were for use in making silica-brick, silicon carbide and ferrosilicon, and for the fluxing of nickel-copper ores. In Saskatchewan the output consisted of low-grade natural silica sands or gravels for use as flux at the Flin Flon smelter of the Hudson Bay Mining and Smelting Co., Ltd. Core and moulding sand which have a high silica content was included in the quartz or silica industry.

TABLE 12. Producers' Shipments of Quartz (Silica), 1951-60

Year	Tons	Value ¹		Year	Tons	Value ¹
						\$/ton
1951	1,904,885	2,258,468		1956	2,142,234	3,036,543
1952	1,783,081	2,253,500		1957	2,139,246	3,185,186
1953	1,785,574	2,070,617		1958	1,453,656	2,538,150
1954	1,716,151	1,574,893		1959	2,163,546	3,436,730
1955	1,869,913	2,039,575		1960	2,260,766	3,266,705

¹ Value of containers is excluded.

TABLE 13. Producers' Shipments of Quartz, by Provinces, 1959 and 1960

	1959		1960	
	Tons	Value	Tons	Value
Production (shipments): ¹		\$		\$
Nova Scotia	1,151	6,338	9,281	52,813
Quebec	301,706	1,533,206	357,165	1,835,960
Ontario	1,600,352	1,363,541	1,659,410	998,281
Manitoba	6,504	38,761	120	179
Saskatchewan	188,515	114,994	169,903	107,039
British Columbia	65,318	379,890	64,887	272,433
Canada	2,163,546	3,436,730	2,260,766	3,266,705

¹ Includes both crude and crushed quartz, crushed sandstone and quartzite and natural silica sands.

TABLE 14. Production¹ of Natural Low-grade Silica Sand and Silica Gravel as Non-ferrous Smelter Flux, 1958-60

	1958		1959		1960	
	Tons	Value	Tons	Value	Tons	Value
		\$		\$		\$
Ontario	569,005	136,066	938,629	218,763	1,072,090	270,701
Saskatchewan	187,360	134,899	188,515	114,994	169,903	107,039
Canada	756,365	270,965	1,127,144	333,757	1,241,993	377,740

¹ Included in totals shown in Tables 12 and 13.

TABLE 15. Imports and Exports of Silica, 1959 and 1960

	1959		1960	
	Tons	Value	Tons	Value
Imports:		\$		\$
Ground flint stone	786	26,477	1,232	21,403
Silica sand for manufacturing	792,129	2,525,319	720,826	2,404,685
Silex or crystallized quartz	13,815	184,451	10,521	161,239
Silica fire-brick .....	...	1,499,027	...	961,767
Quartz, piezo electric	1	72,575	2	126,208
Exports:				
Quartzite	147,412	465,166	13,057	44,505

TABLE 16. Available Statistics on the Consumption of Silica Sand and Ground Quartz, 1955-59

	1955	1956	1957	1958	1959	tons of 2,000 pounds
By industries						
Paints, pigments and varnishes	1,320	1,244	1,307	1,213	1,054	
Soaps and cleaning compounds	9,936	9,347	12,264	16,281	13,660	
Clay products	6,608	8,001	7,102	8,606	7,018	
Asbestos products	396	400	...	...	...
Miscellaneous non-metallic minerals	2,219	3,417	2,542	2,686	3,297	
Roofing paper	4,094	3,478	3,129	3,913	3,682	
Glass	243,691	278,671	268,303	281,381	310,299	
Artificial abrasives	97,968	121,583	125,534	116,948	140,217	
Iron castings	7,717	37	...	...	...
Cooking and heating apparatus	469	—				
Boilers, tanks and plate work	468	18,556 ¹	14,586 ¹	13,385	12,781	
Farm implements	235	573	291	6,725	8,867	
Railway rolling stock	8,700	6,236	9,019	8,726	6,814	
Steel castings	53,082	138,763	144,303	97,678	86,031	
Heavy chemicals	21,700	23,000	26,800	60,482	25,306	
Miscellaneous chemicals	810	1,052	...	2,085	869	
Stone products	1,438	1,358	1,148	838	743	
Machinery	2,132	...	...	...	...
Electrical apparatus .....	...	21	...	...	...
Cement manufacturing	91,407	121,616	89,843	185,522	227,216	
Cement products	2,729	...	...	...	...
Miscellaneous iron and steel	763	...	...	...	...
Ferro-alloys	2,846	4,380	...	...	...
Brass and copper products	1,257	1,533	1,920	2,849	2,438	
Rolled steel products	558	525	...	...	...
Pulp and paper	1,021	548	624	718	8	
Petroleum refining	254	162	...	...	...
Enamelling .....	...	...	...	...	...
Polishes and dressings	16	30	...	...	...
Gypsum products	242	673	...	...	...
Total accounted for	564,076	745,204	708,715	810,036	850,300	
By provinces						
Nova Scotia	3,054	5,462	4,524	2,638	2,414	
New Brunswick	155	106	70	123	115	
Quebec	265,585	374,293	361,350	410,885	345,108	
Ontario	228,341	278,260	263,900	256,453	343,839	
Manitoba	31,756	37,498	13,476	29,173	41,547	
Saskatchewan	1	2,338	...	11,731	13,515	
Alberta	27,774	41,647	40,486	36,510	45,702	
British Columbia	7,410	5,600	4,209	62,523	58,060	
Canada	564,076	745,204	708,715	810,036	850,300	

¹ Includes other foundry sands.

Operators of Feldspar, Quartz and Nepheline Syenite Mines, 1960

Name of firm	Head office address	Location of mine or mill
Nova Scotia:		
Crockett, V.B. ¹	Wallace	Belmont
Le Vatte Construction Co. Ltd. ¹	1195 Kings Road, Sydney	Chegoggin Point
Quebec:		
Adams Quartz & Crystal Mining Ltd.	Racine	Bedford
Bigelow, Gordon ²	Box 759, Buckingham	Derry Twp.
Bigelow, Robt. ^{2,3}	Glen Almond	Templeton.
Bigelow, Venard ²	Glen Almond	Derry Twp.
Bon Ami Ltd. ³	13719 Notre Dame St. E., Montreal	Montreal
Buckingham Cartage Reg'd. ^{1,2}	Glen Almond	Glen Almond
Cadieux, Elzear ²	R.R. No. 1 Buckingham	Buckingham
Canadian Silica Corp. Ltd. ¹	100 Adelaide St. W., Toronto, Ontario	St. Canut
Carrière Bulwer Quarry Reg'd. ¹	1781 Marcel, Sherbrooke	Compton
Charette, F. ^{1,2}	Glen Almond	Derry
Dominion Silica Corp. Ltd. ¹	25 St. Joseph St., Lachine	St. Donat De Montcalm
Donaldson, Gordon ²	Glen Almond	Derry Twp.
Gauthier, Palma ¹	Glen Almond	Buckingham Twp.
Gypsum Lime & Alabastine Ltd. ¹	Box 506, Station "F" Toronto, Ontario	Ste. Emelie
Hart J. Robt. ²	549 Notre Dame St., Gatineau	Portland Twp.
H.C.F. Sands Ltd. ¹	Noranda	St. Bruno de Guigues
International Minerals & Chemicals Corp. Ltd. ^{1,2,3}	77 Metcalfe St., Ottawa, Ontario	Derry Twp.
Lachine, Regis ^{2,1}	St. Pierre de Wakefield	St. Pierre de Wakefield
Laurentian Silica Mines Co. Ltd.	St. Jerome	Kasil
Les Carrières Goyer ¹	Box 550, St. Bruno	St. Hilaire
Montpetit, E., & Fils ⁴	133, rue Principale, Melocheville	Melocheville
Quebec Lithium Corp. ¹	Barraute	Barraute
Radius Exploration Ltd. ¹	5188 Hutchinson Ave., Outremont	St. Clotilde
Spar-Mica Corp. Ltd. ²	10 St. James St. W. Montreal	Baie Johan Beetz
Sicotte, Armand & Fils ¹	Laflèche	Howick
Valley, Percy ^{1,2}	Buckingham	Buckingham Twp.
Union Carbide Canada Ltd. ¹	123 Eglinton Ave. E. Toronto, Ontario	Melocheville
Ontario:		
American Nepheline Corp. ^{3,4}	25 King St. W., Toronto	Methuen Twp.
Algoma Steel Corporation Ltd. ¹	Sault Ste. Marie	Deroche Twp.
Barnes, Wm. R. Co. Ltd. ¹	Waterdown	Vittoria, Capetown
Braas Bros. ¹	R.R. 1, Niagara Falls	Stamford
Canadian Silica Corp. (Ltd.) ^{1,2}	100 Adelaide St. W., Toronto	Little Current, Whitby
Falconbridge Nickel Mines Ltd. ¹	Falconbridge	Falconbridge
International Nickel Co. of Canada Ltd. ¹	Copper Cliff	Garson, Mongowin
International Minerals & Chemicals Corp. Ltd. ^{3,4}	77 Metcalfe St., Ottawa	Blue Mountain
Quartz Crystals Mines Ltd. ¹	366 Bay St., Toronto	Lyndhurst
Union Carbide Canada Ltd. ¹	123 Eglinton Ave. E., Toronto	Killarney
Manitoba:		
Selkirk Silica Co. Ltd. ¹	8th Floor, Boyd Bldg., Winnipeg	Black Island
Greater Winnipeg Water District	455 Ellice Ave., Winnipeg 2	Mile 80
Saskatchewan:		
Hudson Bay Mining & Smelting Co. ¹	Flin Flon, Manitoba	Flin Flon
British Columbia:		
Consolidated Mining & Smelting Co. Ltd. ¹	Trail	Oliver
Pacific Silica Ltd. ¹	Box 397, Oliver	Oliver

¹ Produces silica.² Produces feldspar.³ Operates a mill.⁴ Produces nepheline syenite.

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