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THE NICKEL-COPPER MINING, SMELTING AND REFINING INDUSTRY

1956

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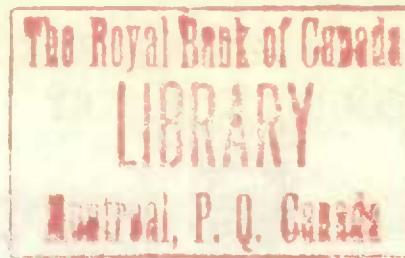
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NOTICE

The annual reports prepared by the Industry and Merchandising Division of the Bureau of Statistics are divided into 3 volumes, as follows: **Volume I** — The Primary Industries, including mining, forestry and fisheries; **Volume II** — Manufacturing; **Volume III** — Merchandising and Services. The volumes are made up of parts, and the parts in turn are subdivided according to the industries which they comprise.

Volume I consists of the following parts:

- Part I — Mineral Statistics
- Part II — Forestry Statistics — Operations in the Woods
- Part III — Fisheries Statistics

Part I includes the following reports which constitute the complete series on Mineral Statistics of Canada. Individual reports are issued as the information becomes available; they are arranged in a form suitable for binding.

- A — General Review of the Mining Industry, 50¢
- B — The Gold Mining Industry, 50¢
- C — The Silver-Lead-Zinc Mining Industry, 25¢
- D — The Nickel-Copper Mining, Smelting and Refining Industry, 25¢
- E — The Iron Mining Industry, 25¢
- F — The Miscellaneous Metal Mining Industry, 25¢
- G — The Smelting and Refining Industry, 25¢
- H — The Coal Mining Industry, \$1.00
- I — The Crude Petroleum and Natural Gas Industry, 25¢
- J — The Asbestos Mining Industry, 25¢
- K — The Feldspar and Quartz Mining Industry, 25¢
- L — The Gypsum Industry, 25¢
- M — The Peat Industry, 25¢
- N — The Salt Industry, 25¢
- O — The Talc and Soapstone Industry, 25¢
- P — The Miscellaneous Non-metal Mining Industry, 25¢
- Q — The Cement Manufacturing Industry, 25¢
- R — The Clay and Clay Products Industry, 25¢
- S — The Lime Industry, 25¢
- T — The Sand and Gravel Industry, 25¢
- U — The Stone Industry, 25¢
- V — Contract Drilling in the Mining Industry, 25¢

(January 31, 1958)

THE NICKEL-COPPER MINING, SMELTING AND REFINING INDUSTRY

1956

Statistics relating to the Nickel-Copper Mining, Smelting and Refining Industry, as shown in this report, include those pertaining to the mining of nickel-copper ores, the smelting of these ores in Canada and the production in the Dominion of refined copper, nickel, etc., by the firms constituting this industry.

In addition to production of nickel, copper and the platinum metals, there is an important recovery from these ores of the associated metals — silver, cobalt, gold, selenium and tellurium — and of sulphur, in the form of sulphur dioxide, for the manufacture of sulphuric acid and liquid sulphur dioxide. The total gross value of the various primary products of this industry considered as a whole was estimated at \$614,096,947 in 1956 compared with \$570,270,680 in 1955.

In Ontario there were four firms producing nickel-copper ores in the Sudbury area. Two of these concerns also operated metallurgical plants. The International Nickel Company of Canada, Limited, had smelters at Copper Cliff and Coniston, while the Falconbridge Nickel Mines Ltd. smelted its ores at the Falconbridge mine located a few miles east of the town of Sudbury. This last-named company exported its matte to a refinery located at Kristiansand, Norway. East Rim Nickel Mines Limited, and Nickel Offsets, Limited, shipped nickel-copper ores and concentrates to the Falconbridge smelter.

The relatively small amount of nickel-oxides sometimes produced at Deloro, Ontario, is recovered from silver-cobalt-nickel-arsenic ores mined in

northern Ontario. Smelter matte made by the International Nickel Company of Canada Limited, is treated in plants located at Clydach, Wales; Huntington, West Virginia, U.S.A.; and at Port Colborne and Copper Cliff in Ontario. Converter copper made by the International Nickel Company is electrolytically refined at Copper Cliff and refined nickel is produced by the company at Port Colborne. In 1955 the International Nickel Company of Canada Limited, shipped ores from the Garson, Creighton, Levack, Frood and Murray mines. Falconbridge Mines Limited, operated the Falconbridge, East, McKim, Mount Nickel, Hardy, Longvack Fecunis Lake and Boundary mines.

The Sherritt-Gordon Mines Ltd., mined and milled nickel-copper ore at Lynn Lake, Manitoba. The nickel concentrates were shipped to the firm's refinery at Fort Saskatchewan, Alberta, and the copper concentrates were treated at the Noranda smelter.

The industry employed an average of 22,684 persons to whom \$103,619,044 were paid as salaries and wages. The fuel cost for the industry was \$15,680,529 and 1,381,413,528 kwh. of electricity were purchased for \$6,423,224. Process supplies cost \$29,320,997. Included in the above figures, were the data relevant to the nickel-copper mines which used \$1,208,975 worth of fuel and 377,852,500 kwh. of purchased electricity valued at \$1,821,658. Fuel for the nickel-copper smelters and refineries cost \$15,471,554 and 1,003,561,028 kwh. of electricity were purchased for \$4,601,566. Process supplies used by the mines cost \$14,931,835 and those used by the smelters and refineries were valued at \$14,389,162.

**TABLE 1. Principal Statistics of the Nickel-Copper Mining, Smelting and Refining Industry¹.
Significant Years, 1921-1956**

Year	Establishments	Employees	Salaries and wages	Cost of fuel and electricity at works	Cost of process supplies, materials, ² containers, at works	Gross selling value of products (f.o.b. works)	Net ³ value of production
	No.	No.	\$	\$	\$	\$	\$
1921	12	N.A.	2,482,965	978,312	N.A.	N.A.	N.A.
1929	8	6,260	10,117,197	2,155,917	"	"	"
1931	10	4,300	7,004,403	2,472,510	"	27,709,234	"
1933	11	3,598	5,588,610	2,582,216	"	31,191,527	"
1937	16	10,758	18,752,727	7,454,717	11,210,353	111,353,066	92,687,996
1939	12	11,494	20,557,838	7,437,370	12,068,595	95,714,524	76,208,559
1941	11	12,759	25,270,497	10,213,183	13,991,741	117,287,713	93,082,789
1944	14	15,457	29,217,445	12,795,637	18,449,774	121,493,774	90,130,255
1946	20	10,181	22,240,671	8,552,300	11,065,124	88,444,103	68,826,679
1949	16	14,398	44,657,092	14,342,097	12,821,605	172,391,089	145,227,387
1951	16	18,546	64,543,280	16,500,093	179,164,037	410,677,639	215,013,509
1953	42	20,887	84,074,041	18,493,063	203,362,221	420,562,436	197,280,197
1954	43	21,172	87,776,066	20,747,907	220,227,328	489,255,764	244,636,028
1955	44	21,356	92,113,487	19,977,063	254,533,382	570,270,680	292,488,506
1956	61	22,684	103,619,044	22,103,753	270,422,772	614,096,947	318,652,627

1. Does not include data for mines, power plants, etc., operated by subsidiary companies.

2. Cost of ores included from 1950 onwards.

3. Gross value less fuel, electricity, process supplies, ores, treatment charges and freight.

TABLE 2. Output from Nickel-Copper Mines in Canada, 1954-1956

	1954	1955	1956
Tons of 2,000			
Ore hoisted	16,748,709	17,022,067	18,453,360
Ore smelted directly	2,079,484	2,022,165	1,519,261
Ore milled	14,609,936	15,022,050	16,548,476
Concentrates produced	3,580,763	3,529,738	3,855,425

TABLE 3. Production of Nickel¹ from Canadian Ores, 1947-1956

Year	Tons	Value	Year	Tons	Value
		\$			\$
1947	118,626	70,650,764	1952	140,559	151,349,438
1948	131,740	86,904,235	1953	143,693	160,430,098
1949	128,689	99,173,289	1954	161,279	180,173,392
1950	123,659	112,104,685	1955	174,928	215,866,007
1951	137,903	151,269,994	1956	178,515	222,204,860

1. Usually includes a small quantity of nickel recovered from silver-cobalt ores.

TABLE 4. Production of Nickel¹, by Months, 1954-1956

Month	1954	1955	1956	Month	1954	1955	1956
Tons of 2,000 pounds							
January	12,765	14,387	14,960	August	13,428	14,775	14,832
February	11,874	13,375	14,972	September	13,521	13,734	14,510
March	13,619	15,544	15,479	October	14,323	14,361	14,742
April	13,015	15,011	14,406	November	14,159	14,290	15,042
May	13,458	15,352	15,178	December	14,947	14,836	14,817
June	13,269	14,783	14,472	Total	161,279	174,928	178,515
July	12,901	14,480	15,105				

1. Refined nickel and nickel in oxide produced, plus recoverable nickel in matte, etc., exported.

TABLE 5. Imports and Exports of Nickel, 1955 and 1956

	1955		1956	
	Quantity	Value	Quantity	Value
IMPORTS				
Nickel and nickel-silver in ingots	lb.	899,121	237,271	483,050
Nickel rods for wire (90% nickel)	"	76,769	87,508	56,465
Nickel in bars and rods, strips and sheets	"	3,118,921	3,096,448	4,492,615
Nickel-silver bars, rods and strips	"	35,712	18,491	25,356
Nickel-chromium in bars	"	74,685	104,055	50,386
Nickel, manufactures of, not plated	"	...	221,297	...
Nickel-plated household hollow-ware	2,218	...
Nickel household hollow-ware	1,894,726	...
Nickel-plated ware, n.o.p.		1,691,232
EXPORTS				
Nickel in matte or speiss	tons	65,954	79,045,411	70,715
Nickel in oxide	"	1,453	1,357,688	1,767
Nickel, fine	"	106,473	134,765,810	104,356
				86,112,992
				1,751,132
				135,044,662

TABLE 6. Production, Consumption and Exports of Nickel, 1947-1956

Year	Production in Canada (all forms, including content in oxide and in matte exported)	Producers' shipments to domestic consumers	Exports		
			Nickel contained in matte or speiss	Nickel contained in oxide	Refined nickel
Tons of 2,000 pounds					
1947	118,626	1,670	39,767	6,535	70,755
1948	131,740	1,887	50,801	9,792	71,247
1949	128,689	1,749	56,902	1,151	69,088
1950	123,659	2,226	53,090	1,667	66,894
1951	137,903	2,744	57,882	944	72,357
1952	140,559	2,223	63,753	1,211	77,058
1953	143,693	2,275	63,909	1,299	79,909
1954	161,279	2,595	65,823	1,486	91,410
1955	174,928	5,020	65,954	1,453	106,473
1956	178,515	5,545	70,715	1,767	104,356

TABLE 7. World Production of Nickel, (From the "Annual Report of the American Bureau of Metal Statistics")

Country	1952	1953	1954	1955	1956
Tons of 2,000 pounds					
Canada ¹	140,559	143,693	161,279	174,928	178,767
New Caledonia ²	11,575	18,739	15,100	18,400	25,500
United States ³	633	602	2,645	3,807	6,723
Cuba ⁴	8,924	13,844	14,545	15,138	16,062
Finland ²	446	418	187	—	—
Union of South Africa ⁶	1,444	1,891	2,112	2,598	2,773
Russia ⁵	41,000	44,000	47,000	47,000	50,000
Total world (estimate)	205,000	224,000	243,000	261,900	279,800

1. Production in all forms from Canadian ores.
2. Nickel content of ore.
3. By-product in electrolytic refining of copper.
4. Nickel content and small fraction of cobalt in oxide.
5. Conjectural.
6. Nickel content of matte.

TABLE 8. Production of New Copper, by Provinces and by Forms, 1955 and 1956

	1955		1956	
	Tons	Value	Tons	Value
By provinces:				
Newfoundland	3,052	\$ 2,250,672	3,108	\$ 2,574,274
Nova Scotia	1,027	757,758	404	334,704
New Brunswick	36	26,290	6	5,272
Quebec	101,021	74,502,645	122,300	101,288,640
Ontario	146,407	107,215,943	156,271	128,552,450
Manitoba	19,379	14,438,505	17,973	14,890,139
Saskatchewan	32,945	24,297,063	33,116	27,426,903
British Columbia	22,127	16,267,579	21,682	17,885,709
Canada	325,994	\$ 239,756,455	354,860	\$ 292,958,091
By forms (where computed):				
In blister and anode copper produced ¹	283,559	209,124,633	312,952	259,187,514
In ores, concentrates and copper matte exported	28,238	20,774,461	25,574	21,108,874
In nickel-copper matte exported	13,198	8,974,691	14,967	11,524,438
In copper salts and powder	999	882,670	1,367	1,137,265
Total accounted for	325,994	239,756,455	354,860	292,958,091

1. Includes a small quantity of copper contained in gold and silver ores shipped to Canadian smelters.

TABLE 9. Production of Copper¹, by Months, 1954-1956

Month	1954	1955	1956	Month	1954	1955	1956
Tons							
January	17,380	26,470	29,945	August	26,812	27,122	28,589
February	18,510	25,260	26,749	September	23,772	27,688	31,066
March	26,704	26,886	31,535	October	27,293	27,683	29,847
April	27,623	25,302	27,718	November	26,322	27,194	29,713
May	27,927	25,819	29,318	December	27,675	32,404	30,402
June	26,115	27,585	26,967	Year	302,732	325,994	354,860

1. Blister copper produced in Canada, plus recoverable copper in concentrates, matte, etc., exported.

TABLE 10 Production of Copper from Ontario Ores Only, 1947-1956

Year	Tons	Value	Year	Tons	Value
		\$			\$
1947	113,933	46,018,544	1952	125,346	70,973,056
1948	120,383	53,384,560	1953	130,582	77,587,439
1949	113,043	44,658,736	1954	140,776	82,099,408
1950	117,210	54,411,033	1955	146,407	107,215,943
1951	128,809	70,861,789	1956	156,271	128,552,450

Note: Mostly from nickel-copper ores.

TABLE 11. Production of Copper, by Kinds of Ores and by Provinces, 1955 and 1956

Province	From copper-gold-silver ores	From nickel-copper ores	From other ores	Total
1955				
Newfoundland	—	—	3,052	3,052
Nova Scotia	—	—	1,027	1,027
New Brunswick	—	—	36	36
Quebec	99,939	—	1,082	101,021
Ontario	1,816	144,511	80	146,407
Manitoba	13,707	5,672	—	19,379
Saskatchewan	32,945	—	—	32,945
British Columbia	18,747	—	3,380	22,127
Canada	167,154	150,183	8,657	325,994
1956				
Newfoundland	—	—	3,108	3,108
Nova Scotia	—	—	404	404
New Brunswick	—	—	6	6
Quebec	120,179	—	2,121	122,300
Ontario	2,724	153,246	301	156,271
Manitoba	13,224	4,749	—	17,973
Saskatchewan	33,116	—	—	33,116
British Columbia	17,878	—	3,304	21,682
Canada	187,121	157,995	9,744	354,860

TABLE 12. Production of Refined Copper, 1947-1956

Year	Tons	Year	Tons
1947	202,427	1952	196,320
1948	221,275	1953	236,966
1949	226,083	1954	253,365
1950	238,204	1955	288,997
1951	245,466	1956	328,458

TABLE 13. Production of Refined Copper, by Months, 1954-1956

Month	1954	1955	1956	Month	1954	1955	1956
	Tons				Tons		
January	15,001	22,600	26,453	August	22,222	26,184	29,019
February	13,955	21,455	26,029	September	22,685	24,752	27,750
March	21,075	25,083	26,550	October	22,161	25,546	29,496
April	20,412	24,077	26,417	November	22,981	25,213	27,146
May	23,012	23,840	27,426	December	24,935	27,172	28,200
June	23,344	21,890	26,922	Year	253,363	288,997	328,458
July	21,582	21,185	27,050				

TABLE 14. Imports and Exports of Copper, 1955 and 1956

	1955		1956	
	Quantity	Value	Quantity	Value
IMPORTS				
Copper in blocks, pigs and ingots	lb.	70,400	29,303	5,081,500
Copper scrap	"	4,501,500	1,734,427	12,917,300
Copper in bars or rods for the manufacture of trolley, telegraph and telephone wires, electric wires and electric cables	"	2,316,500	721,913	4,324,600
Copper bars or rods, n.o.p.	"	153,500	58,587	552,700
Copper in strips, sheets or plates	"	1,186,700	686,372	781,300
Copper tubing, not manufactured	"	945,500	594,866	1,826,500
Copper rollers for wall paper			150,339	79,629
Copper wire, n.o.p.	lb.	121,645	71,914	193,483
Copper wire cloth, woven			61,320	23,907
Copper manufactures, n.o.p.			1,086,974	1,433,659
Copper sub-acetate, copper precipitate	lb.	—	—	1,000
Copper sulphate (blue vitriol)	"	2,265,558	309,963	2,062,982
Copper oxide	"	149,429	74,435	136,716
EXPORTS				
Copper, fine, contained in ore, matte, regulus, etc. tons		41,565	28,563,092	40,994
Copper, old and scrap, slag skimmings	"	18,293	12,094,301	14,593
Copper in ingots, bars, cakes, slabs and billets	"	153,199	109,649,603	174,844
Copper in rods, strips, sheets and plates	"	16,795	13,617,069	9,933
Copper tubing	lb.	4,733,700	2,600,322	3,964,500
Copper wire and cable, insulated			6,607,791	... 6,563,626
Copper wire, bare			1,804,486	... 1,942,830
Copper wire, screen			13,790	... 19,106
Copper manufactures, n.o.p.			99,412	... 38,278

TABLE 15. Production of Primary Copper, Exports and Imports, 1947-1956

Year	Production in Canada ¹	Exports			Imports, refined copper
		Copper in ore, matte, etc.	Blister copper	Refined copper, ingots, bars, etc.	
Tons of 2,000 pounds					
1947	225,861	29,094	—	87,478	—
1948	240,732	28,556	—	116,169	—
1949	263,457	37,057	—	127,160	9
1950	264,209	32,299	—	134,244	122
1951	269,971	36,853	—	101,832	1,511
1952	258,038	34,437	27,974	113,675 ²	12,973
1953	253,252	51,158	3,527	131,994	5,515
1954	302,732	47,411	4,712	156,994	1,703
1955	325,994	41,565	—	153,199	35
1956	354,860	40,994	—	174,844	...

1. Blister copper, plus recoverable copper in matte and concentrates exported.

2. Includes blister and anode copper exported for refining.

TABLE 16. Production of Refined Copper, Consumption, Imports and Exports, 1947-1956

Year	Production in Canada	Domestic consumption	Exports	Imports	Stocks at end of period
Tons of 2,000 pounds					
1947	202,425	109,210	87,478	-	10,931
1948	221,275	109,844	116,169	-	13,956
1949	226,083	100,905	127,160	9	9,844
1950	238,204	106,876	134,244	122	11,598
1951	245,466	134,174	101,832 ¹	1,511	19,590
1952	196,320	130,347	85,701 ¹	12,973	17,935
1953	236,966	105,482	128,467 ¹	5,515	11,728
1954	253,365	102,432	152,282 ¹	1,703	9,736
1955	288,997	133,559	153,199	35	8,293
1956	328,458	145,286	174,844	...	14,736

1. Excludes blister and anode copper which was included in export figures shown in the Trade of Canada Reports.

TABLE 17. World Production of Copper by Countries of Origin of Ore¹
(From the "Annual Report of The American Bureau of Metal Statistics")

Country	1952	1953	1954	1955	1956
Tons of 2,000 pounds					
United States	932,629	948,509	841,071	1,014,442	1,114,285
Mexico	61,166	69,800	62,215	60,355	66,276
Canada	258,038	253,252	302,732	325,994	356,251
Cuba	19,106	17,006	16,773	19,507	16,046
Bolivia	5,184	4,920	4,036	3,855	4,897
Chile	450,436	400,284	400,857	477,869	539,839
Peru	33,563	39,023	41,504	47,843	48,868
Ecuador	-	-	-	6	-
Total America	1,760,122	1,732,794	1,669,188	1,949,871	2,146,462
Austria	2,914	3,279	3,381	2,841	2,579
Finland	25,023	20,700	23,992	25,412	24,830
Germany ²	2,599	2,262	2,458	1,335	1,077
Italy	193	235	685	273	351
Norway	15,027	14,362	14,980	15,419	15,432
Spain ³	9,896	9,406	7,951	6,726	7,525
Sweden	17,500	14,924	14,565	17,275	18,436
Yugoslavia	40,752	38,930	35,439	32,098	35,087
Other Europe ³	15,000	15,500	16,500	17,500	20,000
Total Europe	128,904	119,599	119,951	118,879	123,317
Japan	59,030	65,860	71,483	80,466	85,458
India	6,808	5,510	8,020	8,155	8,543
Korea, Republic of	500	1,500	550	1,400	1,450
Turkey	25,460	25,641	27,727	26,313	27,101
Philippines	14,596	14,016	15,817	19,247	29,721
Cyprus ⁵	29,564	23,937	30,059	26,123	39,497
Other Asia ³	10,000	10,000	10,000	10,500	11,500
Total Asia	145,958	146,464	163,656	172,204	203,270
Belgian Congo	226,797	236,020	246,685	259,158	275,535
Northern Rhodesia	363,188	410,810	438,711	395,307	445,054
South West Africa	14,610	12,486	14,352	23,739	27,953
Union of South Africa	37,758	38,656	45,281 ³	47,484 ³	48,446
Other Africa	2,190	2,200 ³	2,500 ³	2,600 ³	4,000 ³
Total Africa	644,543	700,172	747,529	728,288	800,988
Australia	21,802	38,123	43,632	44,397	57,238
Russia ³	325,000	334,500	351,200	372,500	417,000
Total world as reported	3,026,329	3,071,652	3,095,156	3,386,139	3,750,275

1. Includes copper contents or recoverable contents of ores or concentrates smelted in country of origin and/or shipped to other countries for smelting.

2. Federal Republic of Germany. Soviet Zone is estimated and included under "Other Europe". Russia, Yugoslavia and to some extent countries grouped under "Other" have been estimated.

3. Conjectural.

4. Exports.

5. Excludes copper content of iron pyrites which may or may not have been recovered.

TABLE 18. Canadian Copper Ore Reserves, as Officially Reported
 (From the "Annual Report of the American Bureau of Metal Statistics")

	Year	Province	Ore	Average grade	Copper content
			Short tons	%	Short tons
Amulet Dufault	1956	Quebec	464,000	5.95	27,600
East Sullivan	1956	Quebec	3,405,700	1.22	41,500
Falconbridge	1956	Ontario	45,259,450	0.75	339,400
Granby Consolidated (Allenby)	1956	British Columbia	590,000	0.77	4,500
Hudson Bay	1956	Manitoba	16,516,665	3.15	520,300
International Nickel	1956	Ontario	264,223,823	...	7,948,246 ¹
Noranda	1956	Quebec	12,507,000	2.13	266,400
Normetal	1956	Quebec	3,731,900	2.47	92,200
Quemont	1956	Quebec	7,980,000	1.30	103,700
Sherritt-Gordon (Lynn Lake)	1956	Manitoba	13,070,000	0.58	75,800
Waite Amulet, East and "A" ore bodies	1956	Quebec	522,000	3.46	18,100

1. Copper-nickel content.

TABLE 19. Production of Metals of the Platinum Group¹ Copper-Nickel Ores, 1947-1956

Year	Platinum ²		Palladium ³	
	Fine ounces	Value	Fine ounces	Value
		\$		\$
1947	94,570	5,582,467	110,332	4,387,740
1948	121,162	10,601,675	148,343	6,295,132
1949	153,691	11,595,986	182,225	8,289,063
1950	124,453	10,246,215	148,741	7,578,144
1951	153,461	14,540,430	164,905	7,950,107
1952	122,315	10,916,614	157,407	7,559,109
1953	137,545	12,550,981	166,018	7,495,409
1954	154,356	12,950,469	189,350	7,956,087
1955	170,494	14,747,732	214,252	8,321,633
1956	151,357	15,725,992	163,461	6,681,098

1. Prior to 1945 the figures reported were the refined metals recovered and the contents or concentrates sold each year. The figures for 1945 represent the metal content of platinum metals concentrates produced, together with adjustment of previous figures to this basis for the years 1938 through 1944.

2. In addition, a relatively small quantity of alluvial platinum is usually recovered annually in British Columbia; such recovery in 1946-1947, nil; 1948, 242 ounces; 1949, 93 ounces; 1950, 129 ounces; 1951, 22 ounces; 1952, 2 ounces; 1953-56, nil.

3. Includes other platinum metals except platinum, and represents the entire Canadian production.

TABLE 20. Production of Selenium and Tellurium from Nickel-Copper Ores, 1947-1956

Year	Selenium		Tellurium	
	Pounds	Value	Pounds	Value
		\$		\$
1947	146,406	273,779	6,169	10,796
1948	108,989	217,978	8,739	15,293
1949	86,842	178,026	8,726	15,707
1950	63,709	154,176	6,010	11,419
1951	82,409	267,005	6,301	11,594
1952	81,578	265,129	5,710	9,707
1953	92,698	389,332	4,525	7,919
1954	94,826	474,130	7,195	12,591
1955	94,465	708,488	6,455	11,296
1956	109,156	1,473,606	6,305	11,034

Note: These metals are recovered also from other types of ores, in addition to above.

TABLE 21. Production of Gold and Silver from Nickel-Copper Ores, 1947-1956

Year	Gold		Silver	
	Fine ounces	Value	Fine ounces	Value ¹
	\$		\$	
1947	43,672	1,528,520	1,434,652	1,032,949
1948	39,752	1,391,320	1,404,338	1,053,254
1949	35,748	1,286,928	1,202,989	893,219
1950	36,264	1,379,845	1,045,106	844,655
1951	40,394	1,488,519	1,128,205	1,066,718
1952 ²	43,689	1,497,222	1,231,047	1,028,170
1953	39,726	1,367,369	1,254,637	1,054,020
1954	46,408	1,580,221	1,292,300	1,075,930
1955	46,896	1,618,850	1,497,191	1,320,223
1956	44,752	1,541,706	1,404,032	1,259,136

1. Estimated.

2. Includes revised data - 1947-1951 - of unreported content of platiniferous concentrates.

TABLE 22. Employees and Their Earnings in Nickel-Copper Mines, Smelters and Refineries, 1952-1956

Year	Number of employees					Man-hours worked	Earnings			
	Administration		Workmen		Total employees		Administration	Workmen	Total	
	Male	Female	Male	Female						
1952	1,835	193	17,934	13	19,976	40,159,422	10,356,840	66,088,612	76,445,452	
1953	2,028	190	18,655	14	20,887	41,333,585	11,577,414	72,496,627	84,074,041	
1954	2,155	215	18,789	13	21,172	41,209,414	12,691,332	75,084,734	87,776,066	
1955	2,301	224	18,818	13	21,356	41,580,447	13,847,735	78,265,752	92,113,487	
1956	2,458	217	19,996	13	22,684	45,310,446	15,605,023	88,014,021	103,619,044	

TABLE 23. Workmen, by Sex and Months, Entire Industry, 1955 and 1956

Month	1955		1956	
	Male	Female	Male	Female
Number				
January	18,364	15	19,316	13
February	18,324	16	19,327	12
March	18,372	15	19,450	12
April	18,472	15	19,526	12
May	18,840	12	19,970	13
June	19,023	12	20,369	13
July	19,166	12	20,466	12
August	19,216	12	20,485	12
September	19,090	12	20,202	15
October	18,943	12	20,262	13
November	18,970	12	20,268	14
December	18,967	12	20,237	13
Average	18,818	13	19,996	13
Total man-hours worked	36,120,423		38,699,028	

TABLE 24. Workmen, by Months, in Nickel-Copper Mines Only¹, 1955 and 1956

Month	1955						1956					
	Mine			Mill	Total	Mine			Mill	Total		
	Surface		Under-ground			Surface		Mill				
	Male	Female	Male	Male		Female	Male	Total				
Number												
January	2,169	11	7,093	571	9,844	2,316	13	7,432	636	10,447		
February	2,162	12	7,082	576	9,832	2,295	12	7,544	634	10,485		
March	2,154	11	7,035	597	9,847	2,294	12	7,619	633	10,553		
April	2,247	11	6,985	615	9,858	2,330	12	7,679	630	10,651		
May	2,353	12	6,956	642	9,963	2,382	13	7,730	660	10,785		
June	2,363	12	6,969	659	10,003	2,457	13	7,813	665	10,948		
July	2,343	12	7,016	658	10,029	2,436	12	7,865	688	11,001		
August	2,335	12	7,033	654	10,034	2,456	12	7,894	687	11,049		
September	2,328	12	6,997	627	9,964	2,431	15	7,842	653	10,941		
October	2,317	12	6,983	635	9,947	2,390	13	7,934	662	10,999		
November	2,283	12	7,017	642	9,954	2,349	14	7,930	660	10,953		
December	2,276	12	7,060	645	9,993	2,304	13	8,014	661	10,992		
Average	2,279	12	7,024	628	9,943	2,373	13	7,776	661	10,823		
Total man-hours worked					18,930,813					20,389,189		

1. Included in Table 23.

TABLE 25. Workmen, by Months, in Nickel-Copper Smelters and Refineries Only¹, 1955 and 1956

Month	1955		1956		Month	1955		1956	
	Male	Female	Male	Female		Male	Female	Male	Female
Number									
January	8,531	4	8,382	—	September	9,138	—	9,276	—
February	8,504	4	8,354	—	October	9,008	—	9,276	—
March	8,536	4	8,904	—	November	9,028	—	9,319	—
April	8,625	4	8,887	—	December	8,986	—	9,259	—
May	8,889	—	9,198	—	Average	8,887	1	9,186	—
June	9,032	—	9,434	—	Total man-hours worked	17,139,610		17,809,839	
July	9,149	—	9,477	—					
August	9,194	—	9,448	—					

1. Included in Table 23.

TABLE 26. Fuel and Electricity Used in the Nickel-Copper Mines, 1956

Kind	Unit of measure	Quantity	Cost at plant
			\$
Bituminous coal (a) From Canadian mines	short ton	16,620	192,965
(b) Imported	"	2,426	30,658
Sub-bituminous coal (from Alberta mines only)	"	—	—
Anthracite coal	"	4,498	59,209
Lignite coal	"	—	—
Coke (for fuel only)	"	—	—
Gasoline, (includes gasoline used in cars and trucks)	Imp. gal.	150,521	54,911
Kerosene or coal oil	"	4,851	1,472
Fuel oil	"	4,866,325	841,574
Wood (cords of 128 cubic feet of piled wood)	cord	1,313	15,867

TABLE 26. Fuel and Electricity Used in the Nickel-Copper Mines, 1956 — Continued

Kind	Unit of measure	Quantity	Cost at plant
Gas (a) Liquefied petroleum gases (propane, etc.)	Imp. gal.	35,452	\$ 12,319
(b) Other manufactured gas	M cu. ft.	—	—
(c) Natural gas	"	—	—
Other fuel	k.w.h.	377,852,500	1,821,658
Electricity purchased for power and lighting	"	—	—
Electricity purchased for other purposes	3,030,633
Total (cost only)	k.w.h.	29,743,600	49,143
Electricity generated (a) For own use		1,560,000	
(b) For sale	"	—	

TABLE 27. Fuel and Electricity Used in the Nickel-Copper Smelters and Refineries, 1956

Kind	Unit of measure	Quantity	Cost at plant
Bituminous coal (a) From Canadian mines	short ton	—	\$ —
(b) Imported	"	16,832	189,109
Sub-bituminous coal (from Alberta mines only)	"	—	—
Anthracite coal	"	549,349	6,096,184
Lignite coal	"	—	—
Coke (for fuel only)	"	239,455	4,783,912
Gasoline, (includes gasoline used in cars and trucks)	Imp. gal.	151,820	43,437
Kerosene or coal oil	"	11,262	3,010
Fuel oil	"	25,873,880	3,100,443
Wood (cords of 128 cubic feet of piled wood)	cord	—	—
Gas (a) Liquefied petroleum gases (propane, etc.)	Imp. gal.	64,864	\$ 8,389
(b) Other manufactured gas	M cu. ft.	—	—
(c) Natural gas	"	1,952,752	232,109
Other fuel	—	...	14,961
Electricity purchased for power and lighting	k.w.h.	931,142,149	4,228,731
Electricity purchased for other purposes	"	72,418,379	372,835
Total (cost only)	19,073,120
Electricity generated (a) For own use	k.w.h.	21,107,000	—
(b) For sale	"	—	—

TABLE 28. Specified Taxes Paid by the Nickel-Copper Mining, Smelting and Refining Industry, 1954-1956

—	1954	1955	1956
—	\$	\$	\$
Dominion income tax, including tax on non-operating revenue	23,468,044	19,781,345	42,517,975
Total provincial taxes	3,165,943	3,703,916	5,092,278
Total municipal taxes	1,002,740	1,132,096	1,304,753
Grand total taxes paid	27,636,727	24,617,357	48,915,006

TABLE 29. Miscellaneous Expenditures by the Nickel-Copper Mining, Smelting and Refining Industry, 1954-1956

—	1954	1955	1956
	\$	\$	\$
Workmen's compensation	912,277	1,052,483	1,079,331
Silicosis assessment	3,664	3,878	97,699
Unemployment insurance	524,716	561,080	733,489
Aggregate cost of all supplies purchased	60,782,751	71,276,847	73,687,854
Aggregate cost of plant and equipment purchased	10,937,447	15,001,189	12,321,832

TABLE 30. Capital and Repair Expenditures¹ in the Nickel-Copper Mining Industry, 1952-1956

	Capital expenditures			Repair expenditures			Capital and repair expenditures		
	Construction	Machinery	Sub-Total	Construction	Machinery	Sub-Total	Construction	Machinery	Total
Thousands of dollars									
1952	7,562	5,352	12,914	258	8,209	8,467	7,820	13,561	21,381
1953	19,720	6,690	17,410	2,308	6,531	8,839	13,028	13,221	26,249
1954	11,566	9,142	20,708	2,328	7,218	9,546	13,894	16,360	30,254
1955	8,907	5,584	14,491	2,776	6,469	9,245	11,683	12,053	23,736
1956 ²	12,913	7,562	20,475	3,339	7,481	10,820	16,252	15,043	31,295

1. Source: Private and Public Investment in Canada.

2. Preliminary figures.

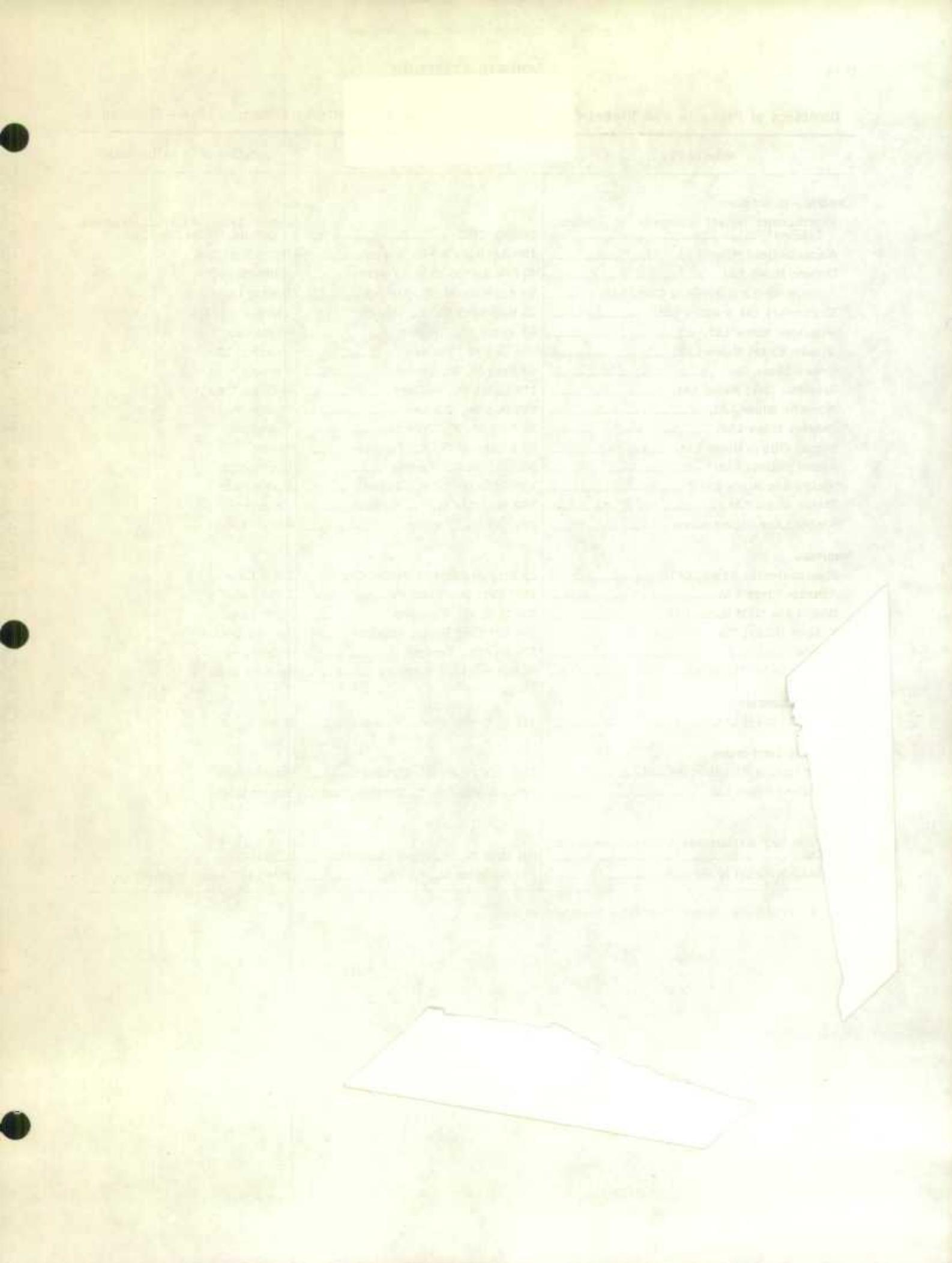
Directory of Firms in the Nickel-Copper Mining, Smelting and Refining Industry, 1956

Name of firm	Head office address	Location of Canadian plant
Quebec:		
Arcadia Nickel Corp. Ltd.	137 Wellington St. W., Toronto, Ontario	Bellechasse Twp.
Asarco Exploration Co. of Can. Ltd.	1004 Royal Bank Bldg., Toronto	Hainault Twp.
Big Town Copper Mines Ltd.	132 St. Jacques Ouest, Montreal.....	Courville
Consolidated Regcourt Mines Ltd.	25 Adelaide St. W., Toronto	Blondeau
Cusco Mines Ltd.	25 Adelaide St. W., Toronto	Opemiska
Doban Mines Ltd.	100 Adelaide St. W., Toronto	Township P-65
Eastern Nickel Ltd.	159 Ouest, rue Craig, Montreal	Courville
Eastern Metals Corp. Ltd.	25 Adelaide St. W., Toronto, Ontario	Rollette Twp.
Gerido Lake Mines Ltd.	199 Bay St., Toronto	Ungava
Gripp Lake Mines Ltd.	80 Richmond St. W., Toronto	Lamarck Twp.
Italia Copper Ltd.	2548 Blvd. Pie IX, Montreal	Senneterre
National Nickel Corp. Ltd.	159 Ouest, rue Craig, Montreal	St. Maglaire
Rickey Petroleum & Mines Ltd.	15½ King St. East, Toronto	Blondeau
Three Brothers Mining Exploration Ltd.	372 Bay St., Toronto	Hainault Twp.
United Renzy Nickel Mines Ltd.	371 Bay St., Toronto	Hainault Twp.
Ontario:		
Arcadia Nickel Corp. Ltd.	137 Wellington St. W., Toronto	Werner Lake
Falconbridge Nickel Mines, Ltd. ¹	44 King St. W., Toronto	Twp. of Falconbridge Blezard, McKim, Levack

Directory of Firms in The Nickel-Copper Mining, Smelting and Refining Industry, 1956—Concluded

Name of firm	Head office address	Location of Canadian plant
Ontario — Concluded:		
International Nickel Company of Canada, Limited ¹	Copper Cliff	Mines: Twp. of Levack, Denison, Garson, Snider, McKim
Aumaque Gold Mines Ltd.	100 Adelaide St. W., Toronto	McConkey Twp.
Dolmac Mines Ltd.	407 McKinnon Bldg., Toronto	Ruthbun Twp.
Eastern Mining & Smelting Corp. Ltd.	25 Adelaide St. W., Toronto	Gordon Lake
El Pen-Rey Oil & Mines Ltd.	62 Richmond St. W., Toronto	Township 130
Milestone Mines Ltd.	67 Yonge St., Toronto	Mavis Lake
Mirado Nickel Mines Ltd.	220 Bay St., Toronto	Waterfall Lake
Emtwo Mines Ltd.	44 King St. W., Toronto	Sudbury
Jess-Mac Gold Mines Ltd.	176 Larch St., Sudbury	Huffman Twp.
Jonsmith Mines Ltd.	357 Bay St., Toronto	Parkin Twp.
Maralgo Mines Ltd.	25 King St. W., Toronto	Temagami
Norpax Oils & Mines Ltd.	85 Richmond St. W., Toronto	Warner
Nickel Offsets Ltd. ¹	50 King St. W., Toronto	Chelmsford
Nickel Rim Mines Ltd. ¹	100 Adelaide St. W., Toronto	Moose Lake
Trebor Mines Ltd.	100 Adelaide St. W., Toronto	Temagami
Werner Lake Nickel Mines	200 Bay St., Toronto	Werner Lake
Manitoba:		
Sherritt-Gordon Mines, Ltd. ¹	25 King St. West, Toronto, Ontario ..	Lynn Lake
Agassiz Mines Ltd.	1035 Erin St., Winnipeg	Lynn Lake
Gods Lake Gold Mines Ltd.	395 Main St., Winnipeg	Lynn Lake
Maskwa Nickel Chrome Mines Ltd.	900 Hamilton Bldg., Winnipeg	Lac du Bonnet
Nicuba Mines Ltd.	220 Bay St., Toronto	Lynn Lake
Mystery Lake Nickel Mines Ltd.	Hamilton Bldg., Winnipeg	Mystery Lake
British Columbia:		
Western Nickel Ltd.	744 H. Hastings St., Vancouver	Hope
Northwest Territories:		
North Rankin Nickel Mines Ltd.	25 Adelaide St. W., Toronto	Rankin Inlet
Goldcrest Mines Ltd.	1201-80 King St. W., Toronto, Ontario	Easter Island
Yukon:		
Hudson Bay Exploration & Development Co. Ltd.	504 Main St., Winnipeg, Manitoba	Kluane Lake
Canalask Nickel Mines Ltd.	100 Adelaide St. W., Toronto	Mile 1167 Alcan Highway

1. Producing—Other firms doing development work only.



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