

REFERENCE PAPERS



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IRON ORE IN CANADA IN 1962

Mineral Resources Division
Department of Mines and Technical Surveys

Background

Between 1886 and 1924, 6.5 million tons of iron ore were produced in Canada. During the following 14-year period no iron ore shipments were recorded. After production was resumed in 1939, when Algoma Ore Properties Limited brought its Helen Mine in the Michipicoten area of Ontario, back into production, the iron ore industry has grown rapidly, particularly within the last decade.

Between 1939 and 1948, almost all of Canada's production was derived from mines in Ontario. In 1949, Newfoundland entered Confederation and shipments from the Wabana Mine were included in Canada's total for the first time. Although production from Ontario mines has increased appreciably in recent years, the commencement of production from the Quebec-Labrador area in 1954 has resulted in Quebec and Newfoundland becoming the major iron ore producing provinces. British Columbia has contributed only a small part of the total Canadian shipments.

In 1961, the Canadian iron ore industry shipped over 18 million long tons* of ore valued at \$175 million. It ranked as the fifth most valuable segment of the Canadian mineral industry and made Canada the world's sixth largest producer of iron ore following Russia, the United States, France, China and Sweden. Despite its importance to the Canadian economy and its prominent international position, the Canadian iron ore industry was responsible for less than 4 per cent of 1961 world production of iron ore. Nevertheless, Canadians are justifiably proud of the progress the industry has made and anticipate its continuing growth and greater contributions to the country's general economy. It is recognized that the rapid growth of the industry has been owing in large part to participation in it by many of the big American iron and steel and merchant-ore companies.

It is of interest to note that it was a Canadian company which sparked the revival of the Canadian iron ore industry in 1939. Algoma Ore Properties, Limited, now a division of The Algoma Steel Corporation, Limited, which had previously mined direct-shipping goethite ore in the Michipicoten area of Ontario during the first quarter of this century, started production from a beneficiating-grade siderite orebody, the first operation of its kind on the North American continent, adjacent to the old Helen Mine. This operation has now an output capacity of about 2 million tons of sinter a year.

* Long tons of 2,240 pounds and throughout unless otherwise noted.

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MINING DIVISION
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The Industry and Its Future

In 1961, 13 companies contributed to Canada's shipments of iron ore from properties operated solely for the production of iron ore. One of these, Canadian Charleson, Limited, shipped from stockpile and did not operate its mine during 1961, although production was resumed in 1962. Of these companies, two produced direct-shipping iron ore, one direct-shipping ore and concentrate, four magnetite concentrate, three hematite concentrate, one sinter from siderite, and two pelletized concentrate. In addition, three companies produced iron-oxide pellets, calcine or sinter as a by-product in the roasting of pyrite or pyrrhotite concentrate. One company produced a special pig iron as a co-product of titanium dioxide slag from ilmenite. Six iron ore properties were also being developed in 1961 for production scheduled to start between 1962 and 1965. One other company is building a plant to produce iron oxide concentrate as a co-product from nickelferous pyrrhotite.

For reasons of geography, company affiliations and to a certain extent metallurgy, a large part (51 per cent in 1961) of all iron ore produced in Canada is exported to the United States. The remainder is exported to Britain, Western Europe and Japan, or is consumed domestically. In turn, about half the Canadian consumption (8.2 million tons in 1961) is imported, principally from the United States. The ratio of iron ore imports to total consumption in Canada is declining gradually but will remain relatively high for many years. This is because of participation by The Steel Company of Canada, Limited, in United States iron mining operations, location of steel plants and the necessity of blending various ores for efficient blast-furnace operation.

The growth of the Canadian iron ore industry will almost be entirely dependent on the export market, mainly in the United States but also in Western Europe, Britain and Japan. Canada will meet increasing competition in world iron ore markets:

- 1) in the United States from domestic ores, South American and African ores;
- 2) in Europe particularly from African and South American ores, and
- 3) in Japan from Australian, African, South American and Asian ores.

There is no longer a shortage of iron ore in the world. Regional shortages do exist, but the building of large ocean-going ore boats and dock facilities is doing much to cancel the regional advantages that present exporters have because of short ocean hauls in small carriers.

Several countries in Africa, Asia and South America have very large reserves of high-grade, direct-shipping ore. Canada possesses large reserves of iron ore but nearly all of it must be classed as medium or low-grade direct-shipping or as concentrating grade. As world iron and steel productive capacity increases and competition for steel markets becomes keener individual steel plants must strive continually to become more efficient. Two ways to achieve increased plant capacity are by installing larger units and by increasing output of existing equipment by mechanical or technical improvements. The desire to increase efficiency has resulted in a trend towards increasing demand for ores of higher grade with better physical characteristics. This demand for better quality ores is being satisfied either by developing orebodies which grade over 60 per cent iron or by beneficiating lower-grade ores to produce high grade iron ore

concentrate. To improve their physical characteristics for blast furnace feed, either of these high grade products may be agglomerated if necessary. Two common methods of agglomeration are sintering and pelletizing. Those countries which possess large deposits of high grade direct-shipping ores therefore have, in this respect, one advantage over Canadian producers which mine medium-grade direct-shipping iron ore or low-grade concentrating-type iron ore.

Another trend is the increasing investment by iron and steel companies in iron-ore producing properties to obtain a 'captive' supply of iron ore. To date, this has been to Canada's advantage, since most of the development of iron-ore deposits in this country has been financed by large American steel producers. The resulting iron ore producing companies then have a captive market and need not worry, to a large extent, over markets. Most of the iron-mining companies have capacity in excess of that which the participating companies use and this excess has been sold mainly to Europe.

The iron and steel industry in Britain and Western Europe is now consuming more ore than its traditional domestic and foreign sources can supply. There is, therefore, a large potential market for Canadian iron ore in Europe. Many European consumers, anxious to obtain a captive source of ore, are beginning to follow the lead of their American counterparts by investing in iron ore developments in overseas countries. Two West German firms and one Italian group own shares in Wabush Mines, which is developing a large beneficiating-grade iron deposit in Labrador for production by 1965. Much European capital, however, is being directed towards countries in Africa, particularly Liberia, that have large deposits of easily-mined, high-grade direct-shipping iron ore. This will assure European steelmakers a supply of ore from these deposits at the expense of future Canadian sales.

Japan, which has traditionally purchased nearly all its iron-ore requirements in competitive world markets, has also begun to participate in financing iron-mining developments in several countries.

The Department of Mines and Technical Surveys periodically makes forecasts of Canadian iron-ore production. Projected on the basis of company intentions and on probable activities in the iron ore field, it appears that Canadian production by the mid-1960's will be above 34 million long tons annually. Projecting further ahead to 1970, it seems possible that Canadian output may attain production of from 45 to 55 million tons a year. These estimates, of course, hinge to a certain extent on developments that occur in other countries, including the United States. There are large reserves of low grade taconite ores in Minnesota and Michigan, which, given favorable taxation considerations, may be further developed for the production of concentrates.

Resources

Sufficient exploration has taken place in Canada to indicate that Canadian resources of iron ore are tremendous. Most known deposits are of the medium grade, direct-shipping variety or of the low-grade, concentrating type. Iron formation extends in an almost continuous belt from the northerly tip of the west coast of Ungava Bay to an area lying about 150 miles north of the Gulf of St. Lawrence. Many occurrences are also found in an irregular belt extending from Lake Mistassini in Quebec westward through the Kirkland Lake area to the Lake St. Joseph area in Northern Ontario. Other large deposits are known

to exist on the Belcher Islands in Hudson Bay, along the east shore of Hudson Bay, and in the Northwest and Yukon Territories. The quantity of low-grade material in these deposits may be measured in billions of tons. It is meaningless to place an arithmetic figure on reserves in Canada as insufficient detailed diamond drilling has been carried out for adequate assessment. There are several promising large iron-ore deposits in Quebec and Ontario which have been developed to such a stage that all that is required for development to production is an assured market for the product. Financing would not likely be difficult to obtain if a market were assured. The shortages of iron ore that do exist in Canada are regional ones as in the Prairie Provinces. There is, in fact, an absolute abundance of iron ore sufficient to supply the domestic and export market for generations to come.

Producers

The following brief comments touch on the highlights of the iron ore industry in Canada. There are many companies also active in exploration:

The Algoma Steel Corporation, Limited Algoma Ore Properties Division

This company operates several mines in the Michipicoten area north of Sault Ste. Marie, Ontario. The Helen and Victoria mines are 12 miles east of Michipicoten Harbour on Lake Superior. The Sir James mine, opened in 1956, is about 3 miles farther east. The George W. MacLeod mine, which came into production in September 1960, will replace the Helen and Victoria underground mines when they are exhausted late in 1962. The Sir James orebody originally contained 80 million tons of siderite to a depth of 3,000 feet, including 7 million tons of open pit ore. The George W. MacLeod orebody contained 50 million tons of siderite. About 57 per cent of the George W. MacLeod ore must be concentrated by heavy-media separation before being sintered and 43 per cent can be sintered directly; 70 per cent of the Sir James ore must be concentrated before being sintered. Sinter-output capacity is 1.8 million long tons a year, averaging 53.5 per cent iron and manganese combined.

Nearly half the sinter production is shipped by rail to the Steelworks Division of the company at Sault Ste. Marie. The remainder is shipped by boat from Michipicoten Harbour to United States ports on the Great Lakes.

Caland Ore Company Limited

Caland, a subsidiary of Inland Steel Company of Chicago, began production of direct-shipping hematite in 1960 from deposits near Atikokan, Ontario, leased from Steep Rock Iron Mines Limited. The Lime Point open pit was the first to begin production. The Mink Point open pit was opened in 1961. Development of the underground Falls Point mine was suspended in 1961 because of economic conditions. The company plans to produce 2.5 million tons a year by 1965 and 3 million tons a year by 1969.

Before production could begin, the East Arm of Steep Rock Lake had to be drained and over 160 million cubic yards of silt were dredged. The company's ore is shipped by rail to Port Arthur on Lake Superior and thence by boat to the parent company's steel plant in Chicago.

Canadian Charleson, Limited

This company, formerly a subsidiary of Charleson Mining Company of the United States, was acquired in 1960 by Oglebay Norton Company of Cleveland, Ohio. It holds 19 claims of iron-bearing gravel south of Steep Rock Lake, Ontario.

A concentrating plant with a designed capacity of nearly 200,000 tons a year was completed and in operation by 1958. Established reserves assure a production life of at least 25 years at capacity. The gravel contains from 5 to 25 per cent iron as hematite and the concentrate grades about 55.8 per cent iron. Washed and sized gravel and sand for construction purposes are also produced. The ore is shipped by rail to Port Arthur and by water to various Canadian and American ports on the Great Lakes.

Empire Development Company, Limited

This company's mine, about 25 miles southwest of Port McNeill, on the northern part of Vancouver Island, British Columbia, began production of magnetite concentrate in 1957. Crude ore is obtained from open pits and concentrated by magnetic separation. All production is sold, under contract, to Japanese steel companies. Known ore reserves will be depleted in 1962.

Hilton Mines, Limited

This company, owned by The Steel Company of Canada, Limited, Jones & Laughlin Steel Corporation and Pickands Mather & Co., operates an open-pit iron mine and pelletizing plant at Shawville, Quebec, about 40 miles northwest of Ottawa. Very low-grade ore is concentrated magnetically and pelletized in a balling drum and shaft-type furnace. Production started in 1958 at a rated capacity of 600,000 tons a year of pellets grading between 66 and 67 per cent iron. Capacity was increased to 800,000 tons a year in 1961. All pellets are shipped by rail to steel plants in Canada and the United States.

Iron Ore Company of Canada

In 1949, Hanna Coal and Iron Corporation, five American steel companies and two concession companies who held the leases on Quebec-Labrador iron-ore deposits, formed Iron Ore Company of Canada. In 1958, a sixth American steel concern acquired an interest in the company.

Construction, based on an anticipated annual production of about 12 million tons of ore, started in 1950 and the first ore was shipped in 1954. A 357-mile railway was built from Sept-Iles on the north shore of the St. Lawrence River to the iron-ore deposits which straddle the Quebec-Labrador border near the town of Schefferville, Quebec.

Seven large open pit mines have been developed, of which six were in operation in 1962. The ore is direct-shipping and grades between 48 and 57 per cent iron. Some manganiferous iron ore is produced. The ore is shipped by boat from Sept-Iles to the plants of the participating steel companies and to other steel companies in Canada, the United States, Britain and Western Europe.

Construction started in 1959 on the development of large deposits of concentrating-grade iron formation in the Wabush Lake area of Labrador some 42 miles west of Mile 224 of the company's Schefferville to Sept-Iles railway. Production of high grade

hematite-magnetite concentrate started in 1962. Annual capacity is 7 million tons of concentrate averaging about 65 per cent iron. A pelletizing plant, to be completed in 1963, will pelletize 5.5 million tons of this concentrate.

Lowphos Ore, Limited

This subsidiary of National Steel Corporation of the United States started development of an iron ore deposit 35 miles north of Sudbury, Ontario, in 1957 for the production of 500,000 tons of concentrate annually. Shipments started in 1959. The reserves were originally estimated at 20 to 25 million tons of magnetic iron formation grading 30 to 35 per cent iron.

In 1962, it was announced that the company would install a pelletizing plant to pelletize all production. The ore is shipped by rail to Depot Harbour on Georgian Bay and thence to the parent company's steel plant at Detroit, Michigan.

Marmoraton Mining Company, Limited

The Marmoraton iron ore deposit is near Marmora, 30 miles east of Peterborough, Ontario. The company is a subsidiary of Bethlehem Steel Company of the United States.

Stripping of the orebody and construction of a concentrator and a pelletizing plant was completed in 1955. The original orebody contained 17 million tons of magnetite grading 37 per cent iron and was capped by about 110 feet of limestone. The plant has an annual capacity of 500,000 tons of pelletized iron ore containing about 66 per cent iron. Some of the output is shipped by rail to Picton on Lake Ontario and thence by boat to the parent company's plants in the United States. The remainder is shipped by rail to steel plants at Lackawanna near Buffalo and to Hamilton.

Nimkish Iron Mines Limited

This company started production of magnetite concentrate in 1959 from a small open pit mine near Nimkish Lake, 26 miles southwest of Beaver Cove on the northern part of Vancouver Island, British Columbia. The crude ore, grading about 39 per cent iron, is magnetically concentrated to about 60 per cent iron. All concentrate is shipped to Japan. The company has a million-ton contract which should be filled by the end of 1963.

Quebec Cartier Mining Company

Quebec Cartier Mining Company, a subsidiary of United States Steel Corporation, began development in 1958 for production of 8 million tons of high-grade concentrate annually from a large deposit near Lac Jeannine, Quebec, some 160 miles northwest of Sept-Iles. The Lac Jeannine deposit contains about 300 million tons of hematite iron formation grading about 30 per cent iron.

Shipments of fine concentrate, containing 66 per cent iron, began in mid-1961. Construction included a large harbor at Port Cartier, a 196-mile railway, mine development, two townsites, a hydro-electric project and a huge concentration plant.

About 60 per cent of its production is to go to the parent company's steel plants in the United States. The remainder will be sold in the United States, Canada, Britain and Western Europe.

Steep Rock Iron Mines Limited

The Steep Rock iron ore deposits lie in the bed of Steep Rock Lake, near the town of Atikokan, 142 miles by rail west of the "Lakehead" cities of Fort William and Port Arthur, Ontario.

Steep Rock Iron Mines Limited began production of direct-shipping iron ore, ranging between 50 and 55 per cent iron, in 1944 following the draining of the Middle Arm of Steep Rock Lake. The original open pit (Errington) has been mined to its economic depth. Production now comes from two other open pits (Hogarth and Roberts) and the Errington underground mine. The company has two gravity ore washing plants and two screening plants to up-grade and improve some of the ore. It is shipped to Canadian and American steel plants. Total ore reserves in the deposits at present being mined were estimated to have originally contained 125 million tons of ore to a depth of a few hundred feet.

Texada Mines Limited

The Texada magnetite deposits are on the northwest coast of Texada Island, about 50 miles northwest of Vancouver, British Columbia. Production started in 1952 and since then ore has come from seven separate pits. Underground exploration began in 1959 and in 1962 it was announced that underground mining would commence in 1963. The ore, containing about 39 per cent iron and small amounts of copper sulphide, is ground and magnetically concentrated. The copper is removed by flotation. All iron ore is shipped to Japan.

Dominion Steel and Coal Corporation, Limited Wabana Mines Division

The Wabana iron-ore deposit lies off the northwest shore of Bell Island, under Conception Bay on the east coast of Newfoundland. Although production from this deposit started in 1895, production figures were not included in those of Canada until Newfoundland joined Confederation in 1949.

The ore is mined underground by room and pillar methods and conveyed on belts to the surface. The crude ore is crushed and up-graded by heavy-media separation. Mine production is between 2 and 3 million tons annually. The parent company consumes about a fifth of production at its steel plant in Sydney, Nova Scotia. Most of the remainder is exported to Britain and Western Europe.

By-Product Producers

The Consolidated Mining and Smelting Company of Canada Limited

For many years, pyrrhotite concentrate has been recovered from the concentration of lead-zinc ore from the company's great Sullivan mine at Kimberley, British Columbia. Some of this pyrrhotite has been roasted to produce sulphuric acid for the company's fertilizer plant. The resultant iron-oxide residue has also been stockpiled.

In 1959, it was announced that sintering facilities and an electric furnace with an annual capacity of 35,000 tons of pig iron would be built. Construction was completed late in 1960 and production from calcine started early in 1961. In 1962, it was announced that the facility would be expanded to produce 110,000 tons of pig iron a year.

The International Nickel Company of Canada, Limited (INCO)

INCO's iron ore recovery plant at Copper Cliff, Ontario, was originally designed to treat 1,000 tons a day of nickeliferous pyrrhotite concentrate recovered from Sudbury-area, copper-nickel ores. The concentrate is roasted, leached to remove nickel, copper and cobalt, and pelletized. The plant was completed in 1958 and in 1960 the company announced plans to triple its output capacity. The expanded plant is scheduled to be in operation by 1963.

Noranda Mines, Limited

The pyrite sintering plant for the production of sulphur dioxide and iron-oxide sinter commenced operation at Cutler, Ontario, in 1957. The iron sulphide concentrate delivered by rail from Noranda, Quebec, is pelletized and then roasted on two sintering machines. The iron-oxide sinter is crushed to two inches, screened to plus one-half inch and shipped to Canadian and United States steel mills.

Quebec Iron and Titanium Corporation (QIT)

QIT was formed in 1948 by Kennecott Copper Corporation and The New Jersey Zinc Company to exploit a large deposit of ilmenite discovered by Kennecott at Lac Tio, 28 miles north of Havre St. Pierre, Quebec. A railway was built between the mine and the dock at Havre St. Pierre and an electric smelter was built at Sorel, 40 miles east of Montreal. Titanium dioxide slag and pig iron are produced. About a million long tons of ilmenite are shipped to Sorel each year.

The ore deposits at Lac Tio are reported to contain over 200 million tons of ilmenite averaging 35 per cent TiO_2 and 40 per cent iron.

Companies Developing for Production

Brynnor Mines, Limited

A subsidiary of Noranda Mines, Limited, this company began development in 1960 of a magnetite deposit near Kennedy Lake, Vancouver Island, British Columbia. Open-pit reserves are reported to be sufficient to produce 5 million tons of concentrate grading 62 per cent iron. Production will start in 1962 at a rate of 700,000 tons of concentrate a year. All production will be shipped to Japan.

Jedway Iron Ore Limited

This subsidiary of The Granby Mining Company Limited is developing a magnetite deposit on Moresby Island, Queen Charlotte Islands, British Columbia, for open-pit production starting in 1962. The ore, grading about 52 per cent iron, will be magnetically concentrated to 62 per cent at a rate of 400,000 tons of concentrate a year. The company has a contract with Japanese steel companies for 2 million tons of concentrate to be delivered over a five-year period.

Jones & Laughlin Steel Corporation

This large United States company leased a large deposit of magnetite iron formation grading about 25 per cent iron near Kirkland Lake, Ontario. It has been announced that a concentrator and a pelletizing plant will be built to produce a million tons a year of iron-ore pellets grading 66 per cent iron. The pellets will be consumed in the company's steel plants. The mine will be an open-pit operation and should be in production in 1964.

Wabush Mines

Wabush Mines is owned by five United States steel or iron ore companies, two Canadian steel companies, two West German steel companies and an Italian steel group. The company is developing a large concentrating-grade iron ore deposit at Wabush Lake, Labrador, not far from similar deposits being developed by the Iron Ore Company of Canada (Carol Lake Project). Approximately a billion tons of open-pit iron ore grading 36 to 38 per cent iron have been outlined.

Early in 1961, the company announced that production would start in 1965 at a rate of 5.5 to 6 million tons of concentrate annually. Capital expenditures on mine development, concentration facilities, two townsites, hydro-electric power plants and harbor facilities are expected to approach \$250 million.

Most of the concentrate will be sold to the participating steel companies although it is possible that some may be available for sale on the open market.

Zeballos Iron Mines Limited

This company is developing a magnetite deposit at Zeballos on the west coast of Vancouver Island, British Columbia, for production of lump iron ore concentrate starting in 1962. The company has a contract with Japanese steel firms to supply 3 million tons of iron ore at a rate of 500,000 tons a year. Initially, crude ore production will come from an open pit but eventually some will come from underground. The ore will be magnetically concentrated.

Falconbridge Nickel Mines, Limited

After considerable pilot-plant test work, the company announced that it would build a plant to treat nickeliferous pyrrhotite concentrate from company mines in the Sudbury, Ontario, area and produce iron oxide fines. The plant will be in production by 1962 at an annual rate of 100,000 tons of iron product grading 67 to 68 per cent iron.

Production, Trade and Consumption of Iron Ore in Canada, 1960-61

	1961*		1960	
	Long Tons	\$	Long Tons	\$
Production (shipments)¹				
Newfoundland	7,012,476	59,828,350	6,795,862	54,673,717
Ontario	5,117,810	55,056,420	4,754,640	48,399,442
Quebec	4,763,767	51,724,876	6,658,903	61,752,485
British Columbia	1,305,351	13,847,374	1,032,408	10,256,779
Total	18,199,404	180,457,020	19,241,813	175,082,523
Byproduct iron ore (shipments)²				
Ilmenite for iron and titania slag	329,263	-	297,176	-
	1,032,122	-	863,726	-
Imports				
United States	3,959,192	45,579,195	4,342,285	46,625,201
Brazil	172,713	1,851,460	156,901	1,606,273
Italy	300	1,213	-	-
Venezuela	-	-	15,400	137,957
Other countries	75	1,185	10	872
Total	4,132,280	47,433,053	4,514,596	48,370,303
Exports (crude, concentrated, agglomerated, calcined and byproduct)				
United States	9,381,816	96,723,618	10,433,244	101,903,339
Britain	2,314,562	20,227,323	3,359,919	27,721,660
Japan	1,159,361	10,152,146	1,040,563	9,424,029
Netherlands ³	725,925	6,335,673	912,237	7,775,700
West Germany	821,820	5,556,920	957,711	6,855,339
Belgium and Luxembourg	348,175	2,729,519	163,986	1,280,310
Italy	104,036	754,815	74,480	512,101
France	11,955	90,857	-	-
Trinidad	1,500	9,375	-	-
Total	14,869,150	142,580,246	16,942,140	155,472,478

Sources: Dominion Bureau of Statistics and supplementary data from individual companies.

¹Includes for the first time data obtained from some byproduct producers. To compare the 1961 figures with those of 1960, make the following deductions from the first 1961 column: from Ontario, 233,750 tons; from British Columbia, 148,780 tons; from the total 382,530 tons.

²Total of shipments of byproduct iron ore compiled from data supplied by individual companies to the Mineral Resources Division. This total does not correspond with the data in footnote¹ (above).

³About 582,700 tons from the 1961 total and 740,000 tons from the 1960 total were transhipped to West Germany.

*All 1961 figures are subject to revision.

Canadian Iron Ore Shipments, by Company, 1959-61
(000's long tons)

<u>Company</u>	<u>Property Location</u>	<u>Material Shipped</u>	<u>% Fe</u>			
			<u>1961</u>	<u>1959</u>	<u>1960</u>	<u>1961</u>
Algoma Ore Properties Div.	Wawa, Ont.	Sintered siderite	50.36	1,935	1,439	1,644
Caland Ore Co. Ltd.	Atikokan, Ont.	Direct-shipping hematite	52.46	-	765	1,009
Canadian Charleson, Ltd.	Atikokan, Ont.	Hematite concentrate	55.76	179	112	18
Empire Development Co., Ltd.	Port McNeill, Vancouver Is., B.C.	Magnetite concentrate	57.84	360	414	265
Hilton Mines, Ltd.	Shawville, Que.	Pelletized concentrate	66.02	584	747	800
Iron Ore Co. of Canada(1)	Schefferville, Que.	Direct-shipping hematite	48.2	13,059	9,809	7,444
Lowphos Ore, Ltd.	Capreol, Ont.	Magnetite concentrate	57.3	173	519	578
Marmoraton Mining Co., Ltd.	Marmora, Ont.	Pelletized concentrate	59.81	351	282	529
Nimpkish Iron Mines Ltd.	Beaver Cove, Vancouver Is., B.C.	Magnetite concentrate	65.1	7	251	378
Quebec Cartier Mining Co.	Gagnon, Que.	Hematite concentrate	64.4	-	-	1,240
Steep Rock Iron Mines Ltd.	Atikokan, Ont.	Direct-shipping and concentrated hematite	51.9	2,747	1,586	1,214
Texada Mines Ltd.	Texada Island, B.C.	Magnetite concentrate	55.1	377	374	446
Wabana Mines Div.	Bell Island, Nfld.	Heavy-media concentrate	61.42	2,095	2,808	2,292
<u>Byproduct Producers</u>						
Consolidated Mining and Smelting Co. of Canada Ltd., The	Kimberley, B.C.	Iron-oxide pellets, (processed to pig iron)	65.0	-	-	41
International Nickel Co. of Canada, Ltd., The	Sudbury, Ont.	Iron-oxide pellets	63.0	162	192	231
Noranda Mines, Ltd.	Mines - Noranda, Que. Plant - Cutler, Ont.	Iron-oxide calcine	64.66	142	106	57
Quebec Iron and Titanium Corp.	Mine - Havre St. Pierre, Que. Plant - Sorel, Que.	Ilmenite (processed to TiO ₂ slag and iron)	40% Fe 35% TiO ₂	555(2)	865(2)	1,032(2)

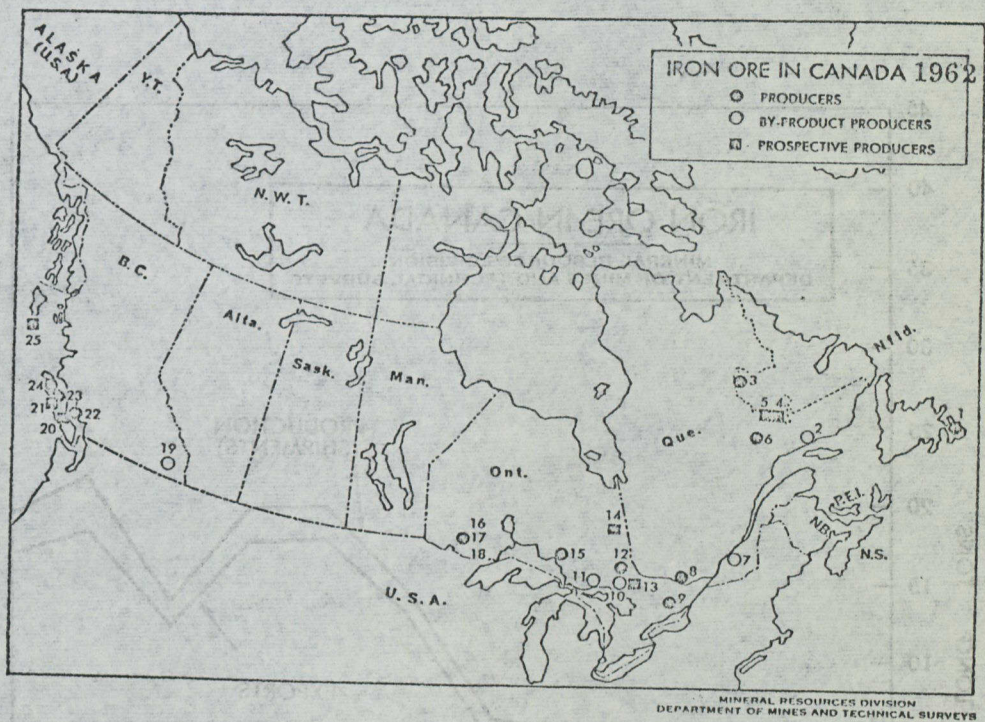
(1) Iron Ore Company of Canada mines ore for the two concession companies, Hollinger North Shore Exploration Co. Ltd. and Labrador Mining and Exploration Co. Ltd. This is included in the total listed for Iron Ore Company (609,454 tons and 816,764 tons for the two companies in 1961).

(2) Ilmenite consumed at Sorel

Canadian Iron Ore Properties Under Development
With Announced Plans for Production

<u>Company</u>	<u>Property Location</u>	<u>Type of Ore</u>	<u>Product to be Shipped</u>
Brynnner Mines. Ltd. (1962)	Kennedy Lake Vancouver Is., B.C.	Magnetite	700,000 tpy [*] magnetite conc. (62% Fe)
Falconbridge Nickel Mines Ltd. (1962)	Sudbury, Ont.	Nickeliferous pyrrhotite	100,000 tpy, iron oxide conc. (67-68% Fe)
Iron Ore Co. of Canada (1962)	Labrador City, Newfoundland.	Magnetite- hematite (38% Fe)	5.5 million tpy pelletized conc. 1.5 million tpy conc. (65% Fe)
Jedway Iron Ore Ltd. (1962)	Moresby Island Queen Charlotte Island, B.C.	Magnetite (51.9% Fe)	400,000 tpy magnetite conc. (62% Fe)
Jones & Laughlin Steel Corp. (1964)	Kirkland Lake, Ontario.	Magnetite (25% Fe)	1 million tpy pelletized conc. (62% Fe)
Wabush Mines (1965)	Wabush Lake, Newfoundland (Labrador)	Magnetite- hematite (37% Fe)	6 million tpy conc. (about 65% Fe)
Zeballos Iron Mines Limited (1962)	Zeballos, Vancouver Island, B.C.	Magnetite (47.9% Fe)	500,000 cpy magnetite conc. (64% Fe)

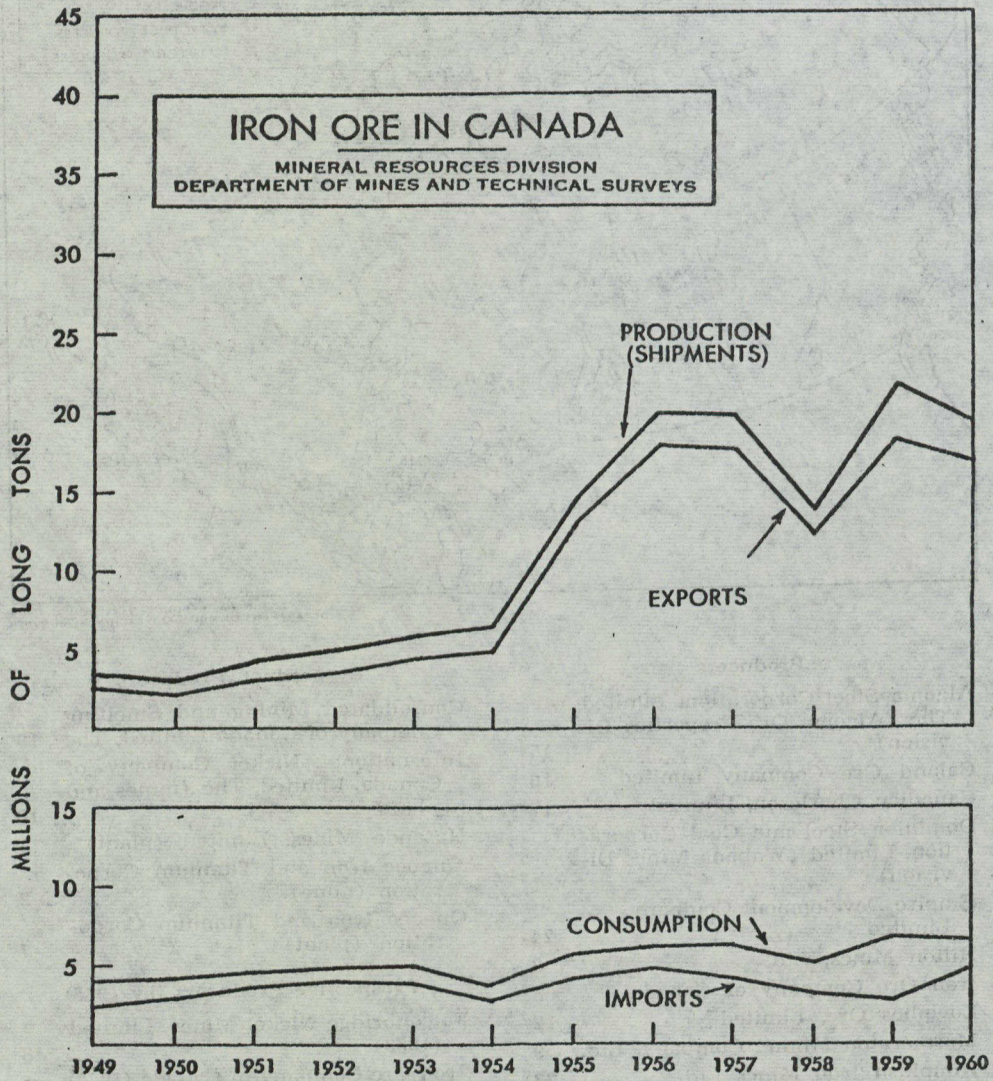
* tpy - tons per year.

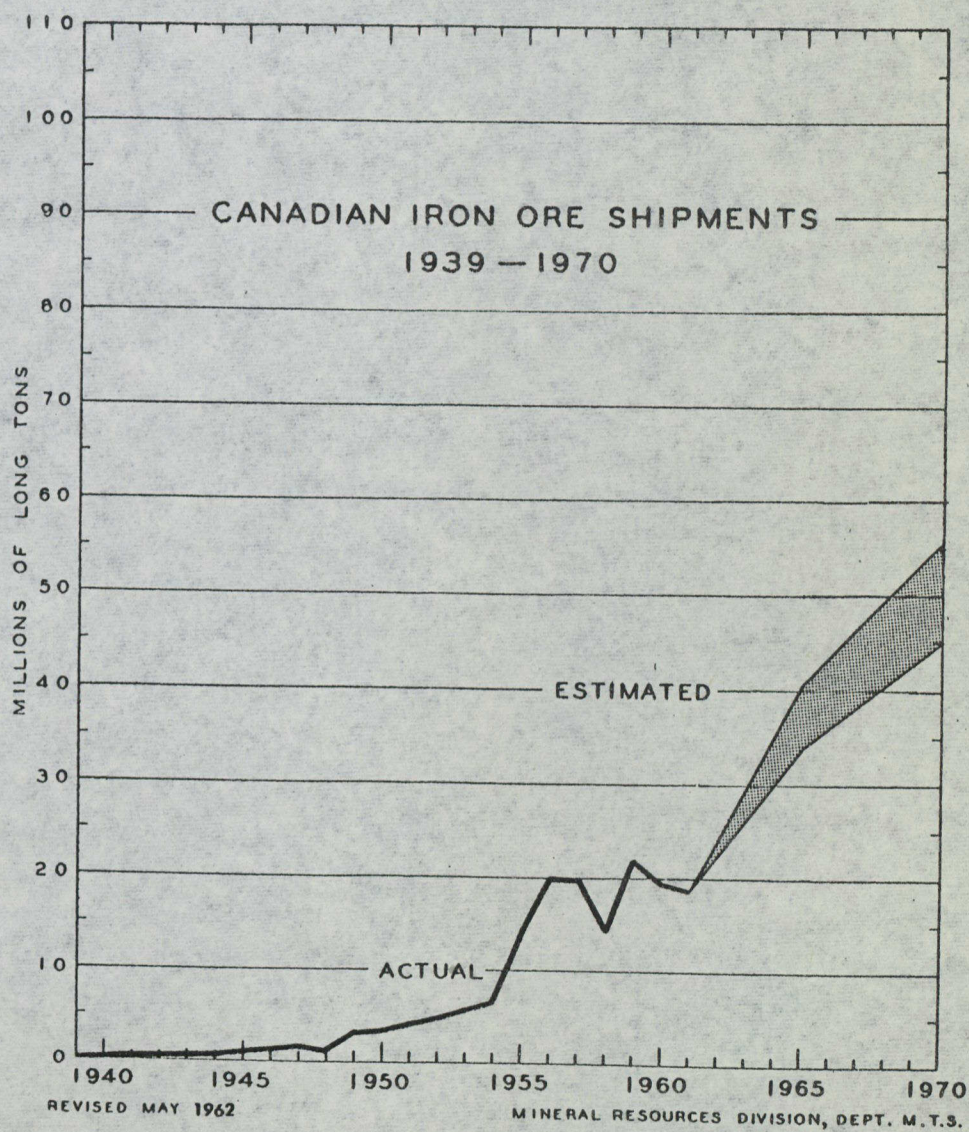


MINERAL RESOURCES DIVISION
DEPARTMENT OF MINES AND TECHNICAL SURVEYS

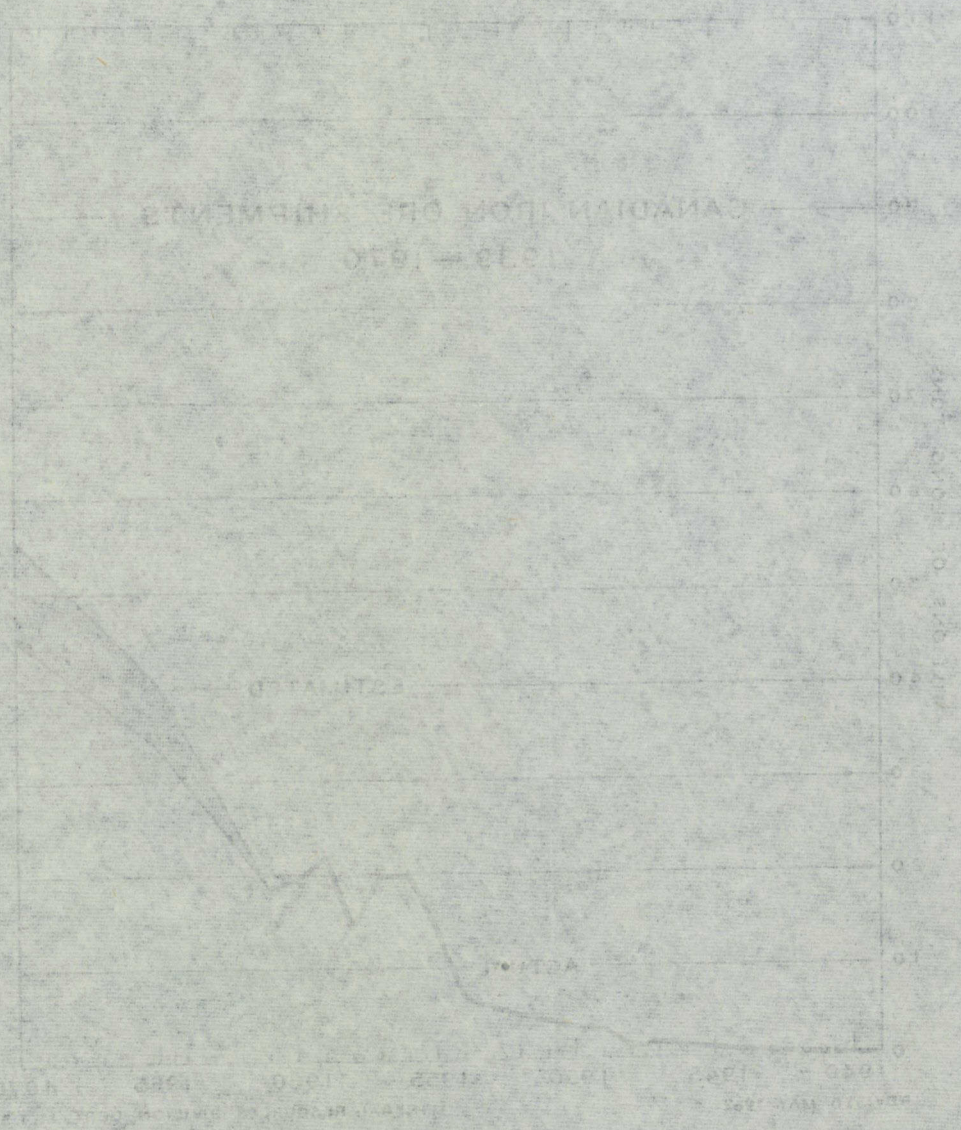
Producers		By-product Producers	
Algoma Steel Corporation, Limited, The (Algoma Ore Properties Division)	15	Consolidated Mining and Smelting Company of Canada Limited, The	19
Caland Ore Company Limited	16	International Nickel Company of Canada, Limited, The (mines and plant)	10
Canadian Charleson, Limited	17	Noranda Mines, Limited (plant)	11
Dominion Steel and Coal Corporation, Limited (Wabana Mines Division)	1	Quebec Iron and Titanium Corporation (mine)	2
Empire Development Company, Limited	24	Quebec Iron and Titanium Corporation (plant)	7
Hilton Mines, Ltd.	8		
Iron Ore Company of Canada	3	Prospective Producers (by 1965)	
Lowphos Ore, Limited	12	Falconbridge Nickel Mines Limited (1962)	13
Marmoraton Mining Company, Ltd.	9	Iron Ore Company of Canada (1962)	5
Nimpkish Iron Mines Ltd.	23	Jones & Laughlin Steel Corporation (1964)	14
Quebec Cartier Mining Company	6	(a) Noranda Exploration Company, Limited (1962)	20
Steep Rock Iron Mines Limited	18	Jedway Iron Ore Limited (1962)	25
Texada Mines Ltd.	22	(b) Wabush Iron Co. Limited (1964-65)	4
		Zeballos Iron Mines Limited (1962)	21

(a) Now Brynnor Mines, Limited
(b) Now Wabush Mines





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