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MINING, METALLURGICAL & CHEMICAL STATISTICS

SUMMARY REVIEW
OF
THE SILVER MINING INDUSTRY
IN
CANADA
1946



OTTAWA
1946



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THE SILVER MINING INDUSTRY IN CANADA, 1946

- (a) The Silver-Cobalt Mining Industry.
- (b) The Silver-Lead-Zinc Mining Industry.

Definition of the Industry - Silver mining in Canada is not a distinct mining industry inasmuch as silver-bearing minerals usually occur in association with other metals of economic value - with lead and zinc; with copper, nickel and arsenic; with lode and placer free gold; in copper-gold and nickel-copper ores, and at Great Bear Lake, North West Territory, with pitchblende. Silver-lead-zinc mining is a very important industry in British Columbia and, to a lesser extent, in the Yukon Territory. In Eastern Canada, lead and zinc ores have been mined in Ontario, Quebec and Nova Scotia.

It is to be noted that, in addition to its recovery from silver-lead ores, zinc is now produced in large quantities from copper-gold-silver ores mined in Quebec, Manitoba and Saskatchewan.

General statistical data contained in this report are essentially those pertaining only to the mining of silver-cobalt and silver-lead-zinc ores but the output figures for specific metals represent the total production from all sources.

(a) THE SILVER-COBALT MINING INDUSTRY

The mining of silver-cobalt ores in Canada is confined almost entirely to the district of Temiskaming in northern Ontario. Veins containing these metals were discovered at or near the present town of Cobalt in 1903 and shipments of ores from this area have been continuous since 1904. Depletion and exhaustion of ore reserves during recent years have resulted in a relatively great decline in the production of metals from these deposits. In most instances, operations at properties, some of which were prominent as producers in the past, are conducted by lessees and shipments range from one to several hundred tons. The increased demand for cobalt as an alloying metal has, for some years, stimulated operations of a salvage nature at several of the older mines.

In order to encourage the production of cobalt for war requirements, United States and Canadian government agencies co-operated during a considerable period of the war in the purchase of Canadian cobalt ores. Ores thus acquired were consigned in 1942 and 1943 to a United States Government agency stock pile located at Deloro, Ontario. These government purchases were discontinued early in 1944.

The number of operators reported as actively engaged in the mining or shipping of silver-cobalt ores in 1946 totalled 11, employees numbered 247, and payments for salaries and wages amounted to \$404,012. The gross value of mine and mill shipments was \$325,846. There was no addition to or withdrawal from the stock pile accumulated during the war for the Metals Reserve Company and located at Deloro, Ontario.

Note: This report was prepared by A.R. Deir, Mining Statistician.

Table 1 - PRINCIPAL STATISTICS OF THE SILVER-COBALT MINING INDUSTRY IN CANADA, 1930-1946

Year	Number of active operators (a)	Number of operating mines (c)	Capital employed \$	Number of em- ployees	Salaries and wages \$	Cost of fuel and electricity \$	Net value of bullion, ore, concentrates or residues sold \$
1930	23	28	12,268,322	1,043	1,488,591	352,844	3,637,181 (b)
1935	27	28	6,380,731	402	494,791	114,439	1,070,716
1936	24	25	5,946,702	363	458,546	104,372	915,376
1937	23	25	2,655,060	300	394,386	90,134	540,762
1938	34	30	2,696,217	297	386,851	73,549	288,293
1939	36	43	2,461,556	323	412,728	63,486	653,032
1940	48	44	337,080	123	158,024	10,900	809,263
1941	24	14	439,877	182	229,984	40,875	662,443
1942	13	14	358,691	192	283,980	68,349	600,207 (d)
1943	20	21	587,039	221	290,654	74,691	578,861 (d)
1944	10	11	(e)	165	260,575	48,323	323,260 (d)
1945	7	8	(e)	166	247,203	49,553	82,508
1946	11	11	(e)	247	404,012	58,712	207,483

(a) Includes lessees shipping from dumps.

(b) Gross value

(c) Includes properties on which operations were of a salvage nature only.

(d) Includes value of ores consigned to the United States Government stock pile at Deloro, Ontario.

(e) Not recorded.

Note: The cost of process supplies used - explosives, etc. - was recorded for the first time in 1935 and, beginning with 1935, this cost together with the cost of fuel and purchased electricity, freight and smelter charges were deducted from the gross value of sales.

Table 2 - SUMMARY (b) OF OPERATIONS OF SILVER-COBALT MINES AND MILLS IN CANADA, 1944-1946

		1 9 4 4	1 9 4 5	1 9 4 6
Number of mines in operation (x)		11	11	11
Ore mined	tons	27,184	30,519	32,841
Ore salvaged from surface (c)	tons	2,189	4,521	291
Ore treated (milled) (a)	tons	30,190	30,319	29,635
Concentrates produced	tons	862	1,047	678
Gross value of bullion, ore, concentrates and residues sold	\$	422,860(d)	152,475	325,846
Cost of freight	\$	3,138	1,704	759
Smelter charges	\$	12,330	8,231	9,960
Cost of fuel and purchased electricity used	\$	48,323	49,553	58,712
Cost of process supplies used	\$	35,809	10,479	48,932
Net value of sales	\$	323,260	82,508	207,483

(x) All mines located in northern Ontario and includes properties on which the operations consisted only in salvaging of ore from dumps, etc.

(a) Does not include crude ore shipped.

(b) Partly estimated as data unobtainable from some small shippers.

(c) Complete data not available

(d) Includes value of ore consigned to United States Government stock pile at Deloro, Ontario.

Table 3 - MINE AND MILL SHIPMENTS OF CANADIAN SILVER-COBALT ORES AND CONCENTRATES, 1945 and 1946

	Gross	Metal Content			
	Weight	Silver	Cobalt	Nickel	Copper
	(tons)	oz.	lb.	lb.	lb.
<u>1 9 4 5</u>					
To Canadian smelters and to Government stock pile at Deloro, Ontario	245	223,784	30,383	19,260	6,296
To foreign plants	430	...	109,123	56,138	...
TOTAL	675	223,784	139,506	75,398	6,296
<u>1 9 4 6</u>					
To Canadian smelters and to Government stock pile at Deloro, Ontario	130	288,877	...	...	1,796
To foreign plants	342	32,884	74,286	30,601	...
TOTAL	472	321,761	74,286	30,601	1,796

- 3 -

Year	On Salaries		On Wages		Total employees	Salaries	Wages	Total salaries and wages
	Male	Female	Male	Female				
	No.	No.	No.	No.				
1939	41	4	278	...	323	75,730	336,998	412,728
1940	17	1	105	...	123	40,970	117,054	158,024
1941	22	3	157	...	182	60,914	169,070	229,984
1942	24	3	165	...	192	63,722	220,258	283,980
1943	34	6	180	1	221	56,570	234,084	290,654
1944	20	4	140	1	165	43,960	216,615	260,575
1945	14	5	146	1	166	42,267	204,936	247,203
1946	20	3	223	1	247	59,085	344,927	404,012

Month	1 9 4 5					1 9 4 6					
	M i n e		Mill	Total		M i n e		Mill	Total		
	Surface	Underground				Surface	Underground				
	Male	Female	Male			Male	Female	Male			
January	36	1	107	26	170	56	...	82	14	2	154
February ...	31	1	88	23	143	52	...	87	14	2	155
March	31	1	90	19	141	68	...	95	14	2	179
April	29	1	82	22	134	85	...	95	18	2	200
May	35	1	84	14	134	101	...	95	29	1	226
June	49	1	71	11	132	99	...	96	33	2	229
July	51	1	77	11	140	107	...	115	35	1	259
August	63	1	72	11	147	121	...	109	35	1	266
September ..	65	1	71	11	148	127	...	115	41	1	284
October	77	1	63	12	153	131	...	108	39	1	279
November ...	71	1	78	12	178	136	...	90	36	1	263
December ...	60	1	79	13	153	124	...	67	20	1	212
AVERAGE .	50	1	81	15	147	112	...	84	27	1	224

Kind	Quantity	Cost at Plant
Bituminous coal - (a) From Canadian mines	Short ton 12	\$ 194
(b) Imported	short ton 1,453	21,819
Anthracite coal - From United States	short ton 58	1,116
Gasoline (including gasoline used in cars and trucks)	Imp. gal. 8,741	3,060
Kerosene or coal oil	Imp. gal. 270	59
Fuel oil and diesel oil	Imp. gal. 25,198	3,716
Wood (cords of 128 cubic feet of piled wood)	cord 33	296
Electricity purchased (including service charge)	K. W. H. 3,525,072	28,452
TOTAL .....	...	58,712

	Ordinarily in Use		In Reserve or Idle	
	Number of units	Total horse power	Number of units	Total horse power
Steam engines	1	100	...	...
Diesel engines	6	735	...	...
Gasoline, gas and oil engines, other than Diesel engines	2	170	...	...
Electric motors operated by purchased power ...	61	1,640	...	...
TOTAL	70	2,645	...	...
Stationary power boilers	3	169	...	...
Motor-generator sets	6	545	...	...

COBALT - Output of Canadian cobalt comes entirely from cobalt-bearing deposits located in northern Ontario and usually includes the cobalt recovered and sold in the Metallic state, the cobalt content of oxides and salts sold and the metal content of cobaltiferous ores exported. No cobalt metal, oxides or salts have been produced in Canada from Canadian ores since 1942 and the 73,900 pounds valued at \$70,215 credited as Canadian cobalt production during the year under review, represents the metal content of Canadian ores exported. Included in these exports is the cobalt content of ores and concentrates reshipped from the stock pile of the Metals Reserve Company, located at Deloro, Ontario. Ores placed on this stock pile are not credited as commercial production until reshipped from Deloro.

Deloro Smelting and Refining Company, Limited, has the only plant in Canada that treats ores for the recovery of cobalt. The plant is located at Deloro, Ontario, and produces cobalt metal, oxides, and salts, chiefly for the British market. For the past three years the company has been treating cobalt residues from Africa and has processed little or no Canadian ores. The Canadian production of cobalt ore from 1942 to 1944 was largely purchased by Deloro Smelting and Refining Company as agent for the Department of Munitions and Supply, acting for Metals Reserve Company of the United States, and was stockpiled for this account. The purchase of these ores for the Metals Reserve Company was discontinued February 22, 1944.

The Bureau of Mines, Ottawa, reported recently that about 75 per cent of the world production of cobalt is used in the metallurgical industry and most of the remainder in the ceramic industry. The metallurgical uses are for high-speed cutting steels; for making stellite or stellite-type alloys, which contain 45 to 50 per cent cobalt, 30 to 37 per cent chromium, and 12 to 17 per cent tungsten. There are various modifications of this composition, but all contain high percentages of cobalt. Stellite is used for cutting metals at high speed and for making permanent magnets, also in the manufacture of valves for aeroplane engines. Small quantities of cobalt used with other chemicals in nickel-plating solutions are said to produce a bright nickel electro deposit as an undercoating for later chromium plating. A certain amount of cobalt is used in electro-plating and as a catalyst. Cobalt oxide is used mainly in the ceramic industry owing to its fine colouring properties. Other compounds of cobalt are used as driers in paints and varnishes.

Since 1904, the first year for which cobalt production was recorded in Canada, the output from Canadian ores, to the end of 1946, totalled 34,600,409 pounds of cobalt in all forms, valued at \$33,887,158.

Table 8 - PRODUCTION OF COBALT FROM CANADIAN ORES, 1932-1946

Year	Pounds	Year	Pounds
1932	490,631	1940	794,359
1933	466,702	1941	263,257
1934	594,671	1942	83,871(x)
1935	681,419	1943	175,961(x)
1936	887,591	1944	36,283(x)
1937	507,064	1945	109,123
1938	459,226	1946	73,900
1939	732,561		

(x) Exclusive of cobalt in ores placed on United States Government stock pile at Deloro, Ontario, but includes metal in ores reshipped from this stock pile.

Table 9 - PRODUCTION OF COBALT FROM CANADIAN ORES, IMPORTS AND EXPORTS, 1945 and 1946

	1945		1946	
	Quantity (pounds)	\$	Quantity (pounds)	\$
Production - (In terms of metallic cobalt and cobalt in oxides and salts sold and in ores exported) ...	109,123	90,026	73,900	70,215
Imports -				
Cobalt ore	2,390,000	869,415	1,170,000	451,115
Oxide of cobalt	16,072	22,390	16,250	21,550
Exports -				
Cobalt, contained in ore	65,000	57,119	48,100	41,091
Cobalt, metallic	583,334	954,257	510,526	854,282
Cobalt, alloys	321,047	1,247,249	111,651	345,012
Cobalt oxides and cobalt salts	555,522	975,035	456,088	608,767

Table 10 - WORLD PRODUCTION OF COBALT, 1939-1945 (FROM THE ANNUAL REPORT OF THE AMERICAN BUREAU OF METAL STATISTICS)

Country	1939	1940	1941	1942	1943	1944	1945
				(pounds)			
Canada (a)	732,561	794,359	263,257	83,871	175,961	36,283	109,123
Burma (b)	504,000	480,000	160,000		Not available		
Northern Rhodesia (c)	3,487,456		Not available				
Belgian Congo (c) ...	2,070,000	5,326,000	5,040,000	3,648,000	4,544,000	4,138,000	7,500,000
French Morocco	1,610,000	804,000	174,000	6,600	606,000	626,000	650,000

(a) Metal recovered from smelter products plus cobalt contained in cobalt residues exported.

(b) Estimated cobalt content of nickel speiss.

(c) Cobalt content of alloys.

Note: Production in Northern Rhodesia has probably continued at 1939 rate.

ARSENIC - Production of Arsenic (As_2O_3) from Canadian ores during 1946 was 745,885 pounds valued at \$38,264, compared with 2,045,730 pounds worth \$130,909 in 1945. The major portion of the production had its origin in Quebec where the O'Brien Gold Mines, Ltd. recovers crude arsenic which is shipped to the Deloro smelter for refining. Due to a mud slide in the Beattie mines, production of arsenic there was temporarily suspended. The production from Ontario ores originated in the silver-cobalt ores treated at the Deloro plant. The auriferous quartz ores exported to the United States from British Columbia mines contain considerable amounts of arsenic but no data are available on the possible recovery of this arsenic and since the Canadian gold mines receive no payment for the arsenic content, it is not credited as commercial production.

Table 11 - PRODUCTION IN CANADA, IMPORTS AND EXPORTS OF ARSENIC, 1945 and 1946

	1 9 4 5		1 9 4 6	
	Quantity (pounds)	Value \$	Quantity (pounds)	Value \$
<u>Production</u> -				
White arsenic	2,045,730	130,909	745,885	38,264
<u>Imports</u> -				
Arsenic acid	5,013,269	185,133	3,867,606	149,111
White arsenic (arsenious oxide) ...	...	...	500	140
Soda, arseniate of, binarseniate ..	47,250	16,980	82,668	15,920
Arsenate of lime	31,398	2,453	60,056	4,292
TOTAL .....	...	204,566	...	169,462
<u>Exports</u> - Arsenic (x) TOTAL	6,070,100	282,718	1,718,300	74,252

(x) Includes arsenic content in gold ores exported from British Columbia.

Table 12 - PRODUCTION IN CANADA, IMPORTS AND EXPORTS OF ARSENIC, 1942-1946

Year	Production (x)	Imports	Exports	
			Refined	Crude
			(pounds)	
1942	7,853,123	2,082	2,204,889	5,944,611
1943	3,153,538	400	2,358,400	199,358
1944	2,627,022	2,405	2,016,000	...
1945	2,045,730	...	1,519,697	...
1946	745,885	...	418,000	...

(x) Crude and refined.

Table 13 - Consumption of Refined Arsenic in Canada, 1943-1946

	1943	1944	1945	1946
	(pounds)			
Glass	135,399	193,530	303,346	336,501
Insecticides (x)	333,178	131,978	340,000	55,808
White metals	60,959	60,902	62,000	60,110
Miscellaneous	7,662	7,800	8,000	14,800
TOTAL ACCOUNTED FOR	537,198	394,210	713,246	467,219

(x) Does not include arsenic acid (As_2O_5) imported for use in making insecticides, as follows:

1943	4,594,034 lb.	1945	5,667,053 lb.
1944	4,565,142 lb.	1946	3,867,606 lb.

(b) THE SILVER-LEAD-ZINC MINING INDUSTRY

In 1946 the silver-lead-zinc mining industry in Canada reported 33 operators or firms engaged in the mining, exploration or development of silver-lead-zinc deposits. Employees numbered 2,451 and salaries and wages paid amounted to \$5,987,111. The cost of explosives and other process supplies consumed totalled \$2,636,735 and fuel and electricity used was recorded at \$780,136. The gross value of production, as reported by the entire industry, totalled \$48,342,501. After deducting fuel, electricity, supplies, freight and treatment charges, the net value was \$39,262,606.

Table 14 - PRINCIPAL STATISTICS OF THE SILVER-LEAD-ZINC MINING INDUSTRY IN CANADA, 1937-1946

Year	Number of active operators	Number of operating plants or mines	Capital employed	Number of employees	Salaries and wages	Cost of fuel and electricity	Value of ores and concentrates sold (b)
	(a)	(a)	\$		\$	\$	\$
1937	128	130	29,637,739	2,220	3,914,643	845,898	22,740,582
1938	107	108	30,386,714	1,640	3,027,915	702,571	18,483,945
1939	82	83	23,664,620	1,646	2,803,057	667,661	13,555,609
1940	82	83	19,969,198	1,585	3,052,532	468,157	16,439,530
1941	63	64	17,717,334	1,666	3,452,199	610,168	20,653,212
1942	44	44	19,484,442	2,185	4,730,370	791,772	23,504,642
1943	31	32	20,603,191	3,097	6,423,724	986,519	21,932,644
1944	20	20	(c)	2,769	5,810,290	860,231	16,802,759
1945	19	19	(c)	2,485	5,473,582	816,972	24,858,013
1946 -							
Quebec	12	10	(c)	597	1,215,867	194,599	3,687,769
British Columbia	21	21	(c)				
Yukon			(c)	1,854	4,771,244	585,537	41,237,861
TOTAL ...	33	31	(c)	2,451	5,987,111	780,136	44,925,620

(a) Usually includes a number of small shippers from whom no particulars were received relating to wages, etc.

(b) The value of fuel, purchased electricity and process supplies have been deducted.

(c) Data not recorded since 1943.

Table 15 - ORE MINED AND MILLED IN THE SILVER-LEAD-ZINC MINING INDUSTRY IN CANADA, 1945 and 1946

		Yukon and Northwest Territories	British Columbia	Quebec	Canada
1945 - Ore mined	ton	93	2,605,238	481,352	3,086,683
Ore milled	ton	...	2,603,703	480,822	3,084,525
Concentrates produced - Lead	ton	2	231,043	9,037	240,082
Zinc	ton	...	304,242	49,895	354,137
Pitchblende-silver	ton	...	...	...	(x)
Gold precipitate	ton	...	...	13	13
1946 - Ore mined	ton	...	2,382,412	423,246	2,805,658
Ore milled	ton	...	2,379,609	423,786	2,803,395
Concentrates produced - Lead	ton	...	233,630	7,708	241,338
Zinc	ton	...	278,784	42,081	320,865
Pitchblende-silver	ton	...	...	...	(x)
Gold precipitate	ton	...	...	16	16

(x) Data not available for publication.

Table 16 - DESTINATION OF SHIPMENTS FROM SILVER-LEAD-ZINC MINES OF CANADA, 1945 and 1946

	Tons shipped	Gross value at shipping point \$	Total Metal Content as Determined by Settlement Assay			
			Gold	Silver	Lead	Zinc
			fine oz.	fine oz.	pounds	pounds
1945						
To Canadian smelters -						
Lead ore	1,113	91,797	51	202,394	99,539	1,737
Lead concentrates	228,009	13,229,040	...	4,519,559	316,116,514	22,778,061
Zinc concentrates (x)	281,032	8,452,888	...	585,376	28,848,207	272,777,802
Dry ore	311	15,817	98	29,959	2,178	...
TOTAL	510,465	21,789,542	149	5,337,288	345,066,438	295,557,600

Silver

- 7 -

Table 16 - DESTINATION OF SHIPMENTS FROM SILVER-LEAD-ZINC MINES OF CANADA, 1945 and 1946 (Concluded)

Table 16 - DESTINATION OF SILVER-LEAD-ZINC MINES OF CANADA, 1945 and 1946 (Continued)						
	Tons shipped	Gross value at shipping point \$	Total Metal Content as Determined by Settlement Assay			
			Gold	Silver	Lead	Zinc
			fine oz.	fine oz.	pounds	pounds
<u>1945</u>						
To Foreign smelters -						
Lead ore	221	41,618	4	41,319	188,420	1,958
Lead concentrates	12,073	1,051,115	2,602	756,797	12,289,803	87,541
Zinc concentrates (x)	73,105	3,593,571	...	80,983	8,987	81,738,255
Gold precipitate	13	625,618	11,690	270,838	...	...
TOTAL	85,412	5,311,922	14,296	1,149,937	12,487,210	81,827,754
GRAND TOTAL (GROSS) .....	...	27,101,464	...	...	...	...
Cost of freight .....	...	1,255,218	...	...	...	...
Cost of fuel and purchased electricity .....	...	816,972	...	...	...	...
Smelter charges .....	...	735,592	...	...	...	...
Cost of process supplies .....	...	1,426,479	...	...	...	...
Net Value .....	...	22,867,803	...	...	...	...
<u>1946</u>						
To Canadian smelters -						
Lead ore	2,539	354,879	139	427,162	308,346	257,022
Lead concentrates	232,242	25,067,780	...	4,894,027	323,499,207	22,387,002
Zinc concentrates (x)	275,623	17,925,145	...	551,866	26,386,871	267,970,154
Dry ore	29	8,533	...	9,924	...	...
TOTAL	510,433	43,356,337	139	5,882,979	350,194,424	290,614,178
To Foreign smelters -						
Lead concentrates	9,096	1,530,761	2,343	719,530	9,624,349	...
Zinc concentrates (x)	45,242	2,867,858	...	6,428	...	50,738,171
Gold precipitates	16	587,545	7,872	359,800	...	...
TOTAL	54,354	4,986,164	10,215	1,085,758	9,624,349	50,738,171
GRAND TOTAL (GROSS)	564,787	48,342,501	10,354	6,968,737	359,818,773	341,352,349
Cost of freight .....	...	1,561,558	...	...	...	...
Cost of fuel and purchased electricity .....	...	780,136	...	...	...	...
Smelter charges .....	...	4,101,466	...	...	...	...
Cost of process supplies .....	...	2,636,735	...	...	...	...
NET VALUE .....	...	39,262,606	...	...	...	...

(x) Does not include any zinc concentrates produced from copper-gold-zinc ores in Quebec, Manitoba, Saskatchewan or British Columbia.

Note: In addition to the metals contained in shipments listed in Table 16, there are considerable quantities of lead and silver contained in ores shipped from certain gold mines in British Columbia. Cadmium, bismuth, antimony, tin and sulphur are also recovered from these ores (silver-lead-zinc).

Table 17 - EMPLOYEES, SALARIES AND WAGES IN THE SILVER-LEAD-ZINC MINING INDUSTRY, 1939-1946

Year	On salaries		On wages		Total employees	Salaries	Wages	Total salaries and wages
	Male	Female	Male	Female				
	No.	No.	No.	No.		\$	\$	\$
1939	242	29	1,375	...	1,646	466,721	2,336,336	2,803,057
1940	224	20	1,341	...	1,585	519,705	2,532,827	3,052,532
1941	217	22	1,427	...	1,666	526,818	2,925,381	3,452,199
1942	281	27	1,877	...	2,185	711,770	4,018,600	4,730,370
1943	359	48	2,646	44	3,097	940,099	5,483,625	6,423,724
1944	318	56	2,336	59	2,769	920,827	4,889,463	5,810,290
1945	309	57	2,068	51	2,485	935,838	4,537,744	5,473,582
1946	336	63	2,030	22	2,451	1,047,121	4,939,990	5,987,111

Table 18 - NUMBER OF WORKMEN, BY MONTHS, IN THE SILVER-LEAD-ZINC MINING INDUSTRY, 1945 and 1946.

1 9 4 6							
Month	1945 Total	M i n e			M i l l		Total
		Surface		Underground	Male	Female	
		Male	Female	Male			
January	2,552	390	18	1,118	383	...	1,909
February	2,343	412	18	1,112	386	...	1,928
March	2,304	409	17	1,079	388	...	1,893
April	2,094	420	16	1,117	406	...	1,959
May	2,101	477	16	1,143	426	...	2,062
June	2,067	538	15	1,224	421	...	2,198
July	2,053	514	16	1,164	391	4	2,089
August	1,977	556	16	1,102	370	...	2,044
September	1,939	512	16	1,097	367	...	1,992
October	2,066	500	21	1,176	373	...	2,070
November	2,122	528	21	1,292	378	...	2,219
December	2,056	494	20	1,296	381	...	2,191
AVERAGE	2,119	480	21	1,160	390	1	2,030

Table 19 - FUEL AND ELECTRICITY USED IN THE SILVER-LEAD-ZINC MINING INDUSTRY, 1945 and 1946.

	Unit of Measure	1 9 4 5		1 9 4 6	
		Quantity	Value	Quantity	Value
Bituminous coal - Canadian	short ton	47,022	240,315	41,198	229,515
Imported	short ton	2,381	28,437	2,234	27,321
Anthracite coal - United States ..	short ton	3	138	80	1,200
Sub-bituminous coal	short ton	335	2,830	5,531	21,302
Coke	short ton	...	...	211	1,479
Gasoline	Imp. gal.	32,874	10,801	28,066	10,626
Kerosene	Imp. gal.	1,282	365	2,293	556
Fuel oil and diesel oil	Imp. gal.	507,880	66,145	347,222	43,995
Wood (cords of 128 cu. ft.)	cord	372	2,450	102	866
Electricity purchased, including service charges	K.W.H.	81,715,733	465,491	72,279,192	443,275
TOTAL .....	...	...	816,972	...	780,135
Electricity generated for own use	K.W.H.	5,222,900	...	2,986,665	...
Process supplies used, explosives, etc. ....	...	...	1,426,479	...	2,636,735

Table 20 - POWER EQUIPMENT IN THE SILVER-LEAD-ZINC MINING INDUSTRY, 1946

	Ordinarily in Use		In Reserve or Idle	
	Number of units	Total horse power	Number of units	Total horse power
Steam engines	1	60	...	...
Steam turbines	3	6,000	...	...
Diesel engines	22	3,445	4	620
Gasoline, gas and oil engines, other than Diesel engines	8	488	2	305
Hydraulic turbines or water wheels	6	1,215	1	50
Electric motors (a) Operated by purchased power.	1,239	24,745	66	2,241
TOTAL	1,279	35,953	73	3,216
(b) Operated by power generated by the establishment	350	6,885	31	787
Stationary boilers	18	2,957	1	30
Motor-generator sets	35	4,525	4	775

Table 21 - DRILLING COMPLETED ON SILVER-LEAD-ZINC DEPOSITS IN CANADA, 1945 and 1946

	Footage Drilled	
	1 9 4 5	1 9 4 6
Diamond drilling for exploration and testing -		
By mining companies with their own personnel and equipment	4,100	5,149
By diamond drilling contractors	53,366	74,288
Other diamond drilling -		
Blast hole diamond drilling:		
By mining companies with their own personnel and equipment .....	...	381,434
By diamond drilling contractors	272,508	6,537
Drilling by percussion or other machines	1,538,711(x)	468,959

(x) Not complete as records are unobtainable at certain mines.

Table 22 - TAXES PAID IN 1945 and 1946 BY SILVER-LEAD-ZINC, NICKEL-COPPER AND COPPER-GOLD-SILVER MINING AND SMELTING COMPANIES

Tax Paid	1 9 4 5	1 9 4 6
	\$	\$
Dominion income tax	9,782,110	4,132,080
Dominion excess profits tax	14,544,969	7,485,000
Provincial tax	2,893,782	850,610
Municipal tax	719,178	295,535

SILVER - Production of fine new silver from all types of Canadian ores totalled 12,544,100 troy ounces valued at \$10,493,139 in 1946 compared with 12,942,906 troy ounces worth \$6,083,166 in 1945. The average estimated price of the fine metal in Canadian funds was 83.65 cents per troy ounce in 1946 as against 47 cents in 1945. Of the total Canadian production in 1946 the British Columbia mines contributed 6,078,419 ounces, Ontario, 2,485,215 ounces, Quebec, 1,916,453 ounces, Saskatchewan, 1,498,496 ounces, Manitoba, 528,017 ounces and smaller amounts from Yukon, Northwest Territories and Nova Scotia. Production of silver in Canada since 1887, the first year for which data are available, to the end of 1946, totalled 906,406,934 ounces, valued at \$511,142,131.

Table 23 - PRODUCTION OF SILVER (IN ALL FORMS) FROM ALL ORES IN CANADA FOR YEARS SPECIFIED, 1887-1946

Year	Ounces	Cents per ounce	Year	Ounces	Cents per ounce
1887	355,083	98.00	1932	18,347,907	31.67
1891	414,523	98.00	1933	15,187,950	37.83
1896	3,205,343	67.06	1934	16,415,282	47.46
1901	5,539,192	58.95	1935	16,618,558	64.79
1906	8,473,379	66.79	1936	18,334,487	45.13
1910 (x)	32,869,264	53.49	1937	22,977,751	44.88
1911	32,559,044	53.30	1938	22,219,195	43.48
1916	25,459,741	65.66	1939	23,163,629	40.49
1919	16,020,657	111.122(f)	1940	23,833,752	38.25
1920	13,330,357	100.90	1941	21,754,408	38.26
1925	20,228,988	69.06	1942	20,695,101	42.17
1927	22,736,698	56.37	1943	17,344,569	45.25
1929	23,143,261	52.99	1944	13,627,109	43.0
1930	26,443,823	38.15	1945	12,942,906	47.0
1931	20,562,247	29.87	1946	12,544,100	83.65

(x) Year of maximum output.

(f) Highest price per ounce recorded since 1887.

Refined silver produced in Canada during 1946 totalled 12,544,100 fine troy ounces compared with 12,942,906 fine troy ounces in 1945.

Table 24 - PRODUCTION OF SILVER (ALL FORMS) IN CANADA, BY MONTHS, 1945 and 1946

Month	1 9 4 5	1 9 4 6
	(Ounces)	
January	1,032,679	1,172,602
February	964,449	1,013,668
March	1,214,945	1,028,797
April	1,067,862	1,135,744
May	1,213,710	1,011,263
June	1,113,656	1,142,305
July	963,561	1,233,310
August	1,069,038	1,155,447
September	975,250	929,005
October	1,049,562	906,467
November	1,110,380	820,218
December	1,167,814	995,274
TOTAL	12,942,906	12,544,100

Table 25 - PRODUCTION OF SILVER BULLION IN CANADA, 1942-1946 (fine ounces)

1942	17,390,000	1945	10,890,000
1943	15,870,000	1946	10,774,000
1944	12,020,000		

Table 26 - SILVER PRODUCTION IN CANADA ACCORDING TO NATURE OF ORES, BY PROVINCES, 1946

Province	Crude placer gold	Auriferous quartz ores	Copper- gold- silver ores	Nickel- copper ores	Silver- lead- zinc ores	Silver- cobalt and other ores	Total
				(Ounces)			
Nova Scotia .....	...	146	...	...	...	...	146
Quebec .....	...	95,944	806,597	...	1,013,912	...	1,916,453
Ontario .....	...	850,991	...	1,205,664	...	428,560	2,485,215
Manitoba .....	...	6,621	521,396	...	...	...	528,017
Saskatchewan .....	...	...	1,498,496	...	...	...	1,498,496
Alberta	12	...	...	...	...	...	12
British Columbia	2,372	58,402	99,414	...	5,918,231(†)	...	6,078,419
Northwest Territories	...	6,112	...	...	...	...	6,112
Yukon	9,416	...	...	...	21,814	...	31,230
CANADA	11,800	1,018,216	2,925,903	1,205,664	6,953,957	428,560	12,544,100

(†) Contains a relatively small quantity recovered from gold ores.

Table 27 - PRODUCTION OF SILVER IN CANADA, BY PROVINCES, AND METHOD OF COMPUTATION 1945 and 1946

	1945		1946	
	Quantity (ounces)	Value \$	Quantity (ounces)	Value \$
Nova Scotia -				
In gold bullion	112	53	146	122
Quebec -				
In anode copper	1,149,089	540,072	806,597	674,718
In gold bullion made and in concentrates exported	1,000,481	470,226	1,109,856	928,395
TOTAL	2,149,570	1,010,298	1,916,453	1,603,113
Ontario -				
In silver recovered in Canada from cobalt ores	476,335	223,877	383,428	320,737
In gold bullion	288,204	135,456	340,300	284,661
In blister copper	1,627,984	765,152	1,153,108	964,575
In ores, concentrates, residues, matte, etc., exported	792,846	372,638	608,379	508,909
TOTAL	3,185,369	1,497,123	2,485,215	2,078,882
Manitoba -				
In blister copper	527,847	248,088	521,396	436,148
In gold bullion (gold mines) and ores exported	6,036	2,837	6,621	5,538
TOTAL	533,883	250,925	528,017	441,686
Saskatchewan -				
In blister copper	1,426,457	670,435	1,498,496	1,253,492
In gold bullion and in crude alluvial gold .....	...	...	...	...
TOTAL	1,426,457	670,435	1,498,496	1,253,492
Alberta -				
In alluvial gold	1	...	12	10
British Columbia -				
In alluvial gold	2,266	1,065	2,372	1,984
In gold bullion	18,628	8,755	13,918	11,642
In base bullion and in ores, etc., exported	5,599,429	2,631,732	6,062,129	5,070,971
TOTAL	5,620,323	2,641,552	6,078,419	5,084,597

Table 27 - PRODUCTION OF SILVER IN CANADA, BY PROVINCES, AND METHOD OF COMPUTATION, 1945 and 1946
(Concluded)

	1945		1946	
	Quantity (ounces)	Value \$	Quantity (ounces)	Value \$
Yukon -				
In alluvial gold	6,282	2,952	9,416	7,876
In silver-lead ores exported	18,876	8,872	21,814	18,748
TOTAL	25,158	11,824	31,230	26,624
Northwest Territories -				
In pitchblende-silver ores shipped to smelters (x) and in gold bullion	2,033	956	6,112	5,113
CANADA - TOTAL	12,942,906	6,083,166	12,544,100	10,493,139

(x) Complete data relating to recovery of silver from pitchblende ores are not available since 1942.

Note: For 1946 silver was valued at 83.6 cents per fine ounce, the average price of domestic sales and sales on the New York market adjusted and expressed in Canadian funds; for 1945, the corresponding price was 47 cents.

Table 28 - SOURCE OF SILVER PRODUCTION IN CANADA BY PERCENTAGES, 1942-1946

Source	1942	1943	1944	1945	1946
In silver-cobalt ores	4.13	0.81	5.05	3.68	3.05
In base bullion (a)	46.16	45.58	35.52	39.51	46.72
In gold ores (bullion and placer)	3.71	3.07	3.21	3.38	3.79
In blister and anode copper (b)	34.28	37.28	39.07	36.56	31.72
In matte, copper ores and silver-lead ores, etc., exported (other than silver-cobalt ores)	11.72	13.26	17.15	16.87	14.72
	100.0	100.0	100.0	100.0	100.0

(a) Chiefly from silver-lead ores.

(b) Made from copper-gold-silver and nickel-copper ores.

Table 29 - ESTIMATED CONSUMPTION OF FINE SILVER IN CANADA FOR INDUSTRIAL PURPOSES, 1937-1946

	In anodes for plating	In making sterling silver and other silver alloys (except lead- silver alloys)	In making silver nitrate	In lead-silver alloys	Miscella- neous	Total
	(ounces)					
1937	600,000	450,000	690,000	Not	150,000	1,890,000
1938	580,000	660,000	750,000	avail-	150,000	2,140,000
1939	750,000	470,000	615,000	able	250,000	2,085,000
1940	600,000	600,000	665,000		200,000	2,065,000
1941	720,000	1,200,000	790,000		250,000	2,960,000
1942	800,000	1,600,000	840,000	240,000	250,000	3,730,000
1943	800,000	1,620,000	890,000	350,000	300,000	3,960,000
1944	900,000	2,650,000	890,000	180,000	360,000	4,980,000
1945	960,000	3,740,000	1,040,000	130,000	410,000	6,280,000
1946	1,310,000	3,490,000	937,000	40,000	404,000	6,181,000

Note: Amounts used for coinage not included in above figures.

Table 30 - ORIGIN OF BULLION DEPOSITED AT VANCOUVER ASSAY OFFICE AND OTTAWA MINT, 1946

Source	Gross Weight	Fine Gold (Ounces)	Fine Silver
<u>From Canadian Mines and Refineries -</u>			
Ontario	2,088,834	1,699,440	237,410
Quebec	850,326	700,868	93,275
British Columbia	108,655	87,683	14,704
Manitoba	94,031	75,576	6,524
Yukon	56,441	45,283	9,417
Nova Scotia	4,670	4,321	144
Northwest Territories	30,968	21,120	5,793
Alberta and Saskatchewan	147	111	13
TOTAL FROM MINES AND REFINERIES.	3,233,172	2,634,402	367,280
From Jewellery and Scrap	41,310	19,221	5,675
GRAND TOTAL	3,274,482	2,653,623	372,955

Table 31 - IMPORTS INTO CANADA AND EXPORTS OF SILVER AND SILVER PRODUCTS, 1945 and 1946

	1945		1946	
	Quantity (ounces)	Value \$	Quantity (ounces)	Value \$
<u>Imports -</u>				
Silver, unmanufactured	1,796	1,407	1,927,922	1,586,092
Silver, manufactures of, n.o.p. ....	...	57,423	...	484,757
Toilet articles of which the most important component, in value, is sterling silver .	...	4,427	...	23,841
TOTAL .....	...	63,357	...	2,094,690
<u>Exports -</u>				
Silver contained in ore, concentrates, etc.	2,232,405	1,153,196	1,863,817	1,429,083
Silver bullion (Canadian)	2,723,698	1,443,814	2,316,689	2,061,338
Silver manufactures .....	...	284,639	...	691,812
TOTAL .....	...	2,881,649	...	4,182,233

Table 32 - AVERAGE COMMERCIAL RATIO OF SILVER TO GOLD FOR EACH SPECIFIED YEAR SINCE 1930
(SUPPLIED BY UNITED STATES MINT)

Year		Year	
1930	53.74	1939	88.84
1931	71.25	1940	99.76
1932	73.29	1941	99.73
1933	59.06	1942	90.57
1934	72.49	1943	85.08 (x)
1935	54.19	1944	85.67 (x)
1936	77.09	1945	73.70 (x)
1937	77.44	1946	42.46 (x)
1938	80.39		

(x) Estimated on averages in Canadian funds.

Table 33 - SILVER PRODUCTION OF THE WORLD (AMERICAN BUREAU OF METAL STATISTICS) - FINE TROY OUNCES

	1940	1945	1946
<u>North America -</u>			
United States (including Philippine Islands) ..	67,013,000	29,332,000	21,677,000
Canada	23,833,752	12,778,000	12,870,000
Mexico	82,638,167	60,000,000	48,297,659
Newfoundland	1,494,077	1,076,000	1,107,827
TOTAL NORTH AMERICA	174,978,996	103,186,000	83,952,486

Table 33 - SILVER PRODUCTION OF THE WORLD (AMERICAN BUREAU OF METAL STATISTICS) - FINE TROY OUNCES
(Concluded)

	1940	1945	1946
<u>Central America and West Indies</u>	4,600,000	3,600,000	3,600,000
<u>South America</u> -			
Argentina	2,873,000	2,760,000	3,090,000
Bolivia	5,626,250	6,687,200	6,400,000
Chile	1,506,314	825,419	532,722
Colombia	260,310	168,699	146,000
Ecuador	105,000	314,000	270,000
Peru	19,366,251	15,000,000	14,467,500
Other South America	50,000	50,000	50,000
TOTAL SOUTH AMERICA	29,787,425	25,805,318	24,956,222
<u>Europe</u> -			
Czechoslovakia	870,000		(x)
France	393,870		
Great Britain	81,496	26,808	25,000
Norway	302,210	131,815	215,400
Romania	500,204	189,689	(x)
Spain	1,050,341	497,800	600,000
Sweden	1,115,316	1,135,152	1,000,000
Australia	15,412,581	8,076,740	7,000,000
New Guinea	199,084	...	...
New Zealand	415,330	244,544	250,000
<u>Asia</u> -			
India and Burma	6,080,000		
Netherlands Indies	1,499,544		(x)
Turkey	575,000		
<u>Africa</u> -			
Algeria	47,614		(x)
Rhodesia	266,216	96,000	95,168
Transvaal, Cape Colony and Natal	1,292,284	1,236,190	1,203,978
Belgian Congo	2,256,930	2,500,000	2,000,000
French Morocco	294,108		(x)
Southwest Africa	381,500	...	...
Tunis	41,056		(x)

Note: World totals are not shown, as production from Russia, Siberia, Japan, Korea and some other countries is not known.

(x) Not available.

LEAD - Output of new lead totalled 353,973,776 pounds in 1946 compared with 346,994,472 pounds in 1945, these figures representing the lead in base bullion produced in Canada plus the lead content in ores exported. The production of new refined lead was 331,488,000 pounds in 1946 and 326,206,000 pounds in 1945.

Lead production in Canada comes from the silver-lead-zinc mines in British Columbia and from the zinc-lead mines in Quebec and Ontario. The Sullivan mine at Kimberley, British Columbia, operated by the Consolidated Mining and Smelting Company of Canada, is the principal source of production. Concentrates from the mine are treated in the Company's smelter at Trail, British Columbia. All concentrates produced in eastern Canada are exported for further treatment.

The Consolidated Mining & Smelting Company of Canada Ltd., Trail, British Columbia, is the only producer of new refined lead.

Table 34 - PRODUCTION (x) OF NEW LEAD IN CANADA, 1932-1946

Year	Tons	\$	Average price per pound (Canadian funds)
1932	127,974	5,409,704	2.114
1933	133,238	6,372,998	2.392
1934	173,138	8,436,658	2.436
1935	169,553	10,624,772	3.133
1936	191,590	14,993,869	3.913
1937	206,000	21,053,173	5.110
1938	209,464	14,008,941	3.344
1939	194,285	12,313,768	3.169
1940	235,925	15,863,605	3.362
1941	230,084	15,470,815	3.362
1942	256,071	17,218,233	3.362
1943	222,030	16,670,041	3.754
1944	152,291	13,706,199	4.500
1945	173,497	17,349,723	5.00
1946	176,987	23,893,230	6.75

(x) Primary lead in base bullion produced plus lead in ores exported.

Table 35 - PRODUCTION OF LEAD IN CANADA, BY MONTHS, 1946 and 1947

Month	Lead (All Forms)		Refined Lead	
	1 9 4 6	1 9 4 7 (x)	1 9 4 6	1 9 4 7 (x)
	Tons			
January	16,869	12,576	15,827	13,385
February	15,090	12,636	13,447	13,252
March	15,491	14,425	15,139	14,857
April	15,282	12,925	14,708	14,014
May	14,879	12,836	15,362	14,837
June	15,313	14,348	14,627	14,470
July	15,676	14,052	12,820	12,475
August	14,901	13,612	13,126	9,140
September	14,380	13,261	12,490	13,899
October	14,728	12,787	12,700	14,139
November	11,229	14,651	12,415	13,726
December	13,149	10,943	13,082	13,806
TOTAL	176,987	159,052	165,744	162,000

(x) Subject to revision.

Table 36 - PRODUCTION OF NEW REFINED LEAD IN CANADA, 1932-1946

Year	Tons	Year	Tons
1932	126,568	1940	220,088
1933	127,283	1941	228,027
1934	157,229	1942	243,306
1935	163,738	1943	223,871
1936	181,725	1944	242,581
1937	199,697	1945	163,103
1938	200,382	1946	165,744
1939	190,569		

Table 37 - PRODUCTION IN CANADA, IMPORTS AND EXPORTS OF LEAD, 1945 and 1946

	1 9 4 5		1 9 4 6	
	Pounds	Value	Pounds	Value
	\$			
Production -				
Quebec	9,229,726	461,486	7,359,708	496,780
Ontario	668,762	33,438	699,244	47,199
British Columbia	336,976,468	16,848,823	345,862,680	23,345,731
Yukon	119,516	5,976	52,144	3,520
TOTAL	346,994,472	17,349,723	353,973,776	23,893,230

Table 37 - PRODUCTION IN CANADA, IMPORTS AND EXPORTS OF LEAD, 1945 and 1946 (Concluded)

	1 9 4 5		1 9 4 6	
	Pounds	Value	Pounds	Value
Imports -				
Pig and block	17,117	3,325	12,580	2,349
Old and scrap	36,871	1,045	66,835	1,593
Bars and sheets	29,586	3,927	16,057	2,279
Litharge for storage batteries	3,526,100	315,553	2,357,100	239,617
Acetate of lead	134,521	14,428	120,280	15,200
Nitrate of lead	146,362	15,244	277,907	34,818
Other manufactures .....	...	326,102	...	138,592
Shots and bullets	1,393	298	4,225	734
Lead tetraethyl, compounds of	12,030,857	4,056,553	12,671,641	4,075,721
Lead capsules for bottles .....	...	126	...	457
Lead pigments -				
Dry white lead	128,080	11,757	97,065	10,745
White lead, ground in oil	2,112	150	850	132
Dry red lead and orange mineral .	64,289	7,497	69,977	8,946
TOTAL .....	...	4,756,005	...	4,531,183
Exports -				
Lead, contained in ore	15,668,200	573,690	12,013,700	736,933
Pig lead	214,583,600	8,603,049	208,218,100	15,977,709
White lead	785,800	82,215	819,800	93,718
Lead, manufactures .....	...	...	...	130,877
TOTAL .....	...	9,258,954	...	16,939,237

Table 38 - PRODUCTION, IMPORTS, EXPORTS AND DOMESTIC CONSUMPTION OF REFINED LEAD, 1937-1946

Year	Production in Canada	Domestic consump- tion	Exports	Imports	Stocks (x) at end of period
(Tons of 2,000 pounds)					
1937	199,697	24,976	176,570	33	Not
1938	200,381	25,791	154,932	28	avail-
1939	190,568	27,095	180,736	6	able
1940	220,087	37,621	151,546	121	62,653
1941	228,027	58,403	184,289	148	42,371
1942	243,306	58,203	210,782	9	32,975
1943	223,871	53,090	154,473	10	34,131
1944	142,581	51,671	102,879	10	26,325
1945	162,537	62,263	107,291	8	19,900
1946	176,987	62,784	102,000	6	21,230

(x) Producers' and consumers'.

Table 39 - CONSUMPTION OF REFINED LEAD IN CANADA BY PRINCIPAL END USES, 1945 and 1946

Uses	1 9 4 5	1 9 4 6
(Tons)		
Solders and alloys	24,611	27,329
White lead, red lead and litharge	10,821	11,965
Storage batteries	8,275	8,472
Foil and collapsible tubes	3,324	1,708
Ammunition	2,634	686
Iron and steel	1,292	1,137
Cable covering	5,994	9,267
Miscellaneous	5,312	2,220
TOTAL	62,263	62,784

Table 40 - LEAD PRODUCTION OF THE WORLD ON MINE BASIS, 1940, 1944 and 1945 (FROM THE ANNUAL REPORT OF THE AMERICAN BUREAU OF METAL STATISTICS)

	1 9 4 0	1 9 4 5	1 9 4 6
	(tons of 2,000 pounds)		
United States	457,392	390,831	332,478
Canada	235,925	173,497	178,726
Newfoundland	26,235	27,900	27,793
Mexico	216,330	225,875	186,592
TOTAL NORTH AMERICA	935,882	818,103	725,589
Argentina	32,738	20,200	20,000
Bolivia	12,855	10,481	9,300
Peru	55,599	59,154	46,000
TOTAL SOUTH AMERICA	101,192	89,835	75,300
Czechoslovakia	3,400	(a)	(a)
France	2,695	8,297	12,883
Germany	101,266	(a)	(a)
Great Britain	14,771	3,209	2,912
Greece .....	...	...	520
Italy	48,900	2,778	14,964
Poland	(c)	6,600	9,868
Romania	(a)	(a)	1,400
Spain	30,000	28,853	42,380
Sweden	11,049	22,153	(d)
Yugoslavia	75,838	(a)	(a)
Burma	88,967	...	...
China, including Hong Kong	5,512	(b)	(b)
Turkey	900	...	...
Australia	314,491	180,179	185,500
Algeria	2,600	1,058	950
French Morocco	25,519	11,800	9,700
French Equatorial Africa .....	...	3,200	(a)
Tunis	13,536	11,000	9,400
Rhodesia	321	1,926	9,226

(a) Unknown.

(b) Unknown, but probably small.

(c) Included with Germany.

(d) Unknown; smelters' production was 14,430 tons in 1945 and 9,500 tons in 1946, probably accounting for the major part of the domestic mine production.

Note: Omitted are Russia, Japan, Manchuria and Korea.

ZINC - Production of primary zinc in all forms totalled 470,620,360 pounds in 1946, a decline of 9 percent from the 1945 total of 517,213,604 pounds. Over 50 percent of the output in 1946 came from the Sullivan mine of the Consolidated Mining and Smelting Company of Canada Limited, near Kimberley, British Columbia. Several mines in British Columbia exported zinc in concentrates and many shipped the ores to the Trail smelter. The zinc recovered at the Hudson Bay Mining and Smelting Company's refinery originated in the copper-gold-silver ores at Flin Flon and Sherritt-Gordon. Zinc concentrates from the mines of Ontario and Quebec were exported. Producers in Quebec include, Waite Amulet and Normetal which have copper-gold-silver ores, also Golden-Manitou and New Calumet whose ores are classified as lead-zinc.

Output of new refined zinc totalled 185,683 tons in 1946 as compared with 183,317 tons in 1945.

Table 41 - PRODUCTION (b) OF ZINC FROM ALL TYPES OF CANADIAN ORES, 1932-1946

Year	Tons	\$	Average price per pound (Canadian funds) ¢
1932	86,142	4,144,454	2.41
1933	99,566	6,393,132	3.21
1934	149,290	9,087,571	3.04
1935	160,325	9,936,908	3.10
1936	166,591	11,045,007	3.31
1937	185,169	18,153,949	4.90
1938	190,753	11,723,698	3.07
1939	197,267	12,108,244	3.07
1940	212,014	14,463,624	3.411
1941	156,191	17,477,337	3.411
1942	290,129	19,792,579	3.411
1943 (a)	305,377	24,430,174	4.00
1944	225,412	23,685,405	4.30
1945	258,607	33,308,556	6.44
1946	235,310	36,755,450	7.81

(a) Year of maximum Canadian zinc production.

(b) Comprises refined zinc made in Canada plus zinc in ores, etc., exported.

The total value of Canadian zinc production since the first recording of Canadian zinc statistics in 1898, and inclusive of 1946 totalled \$350,597,787.

Table 42 - PRODUCTION OF ZINC IN CANADA, BY MONTHS, 1945 and 1946

	Primary Zinc in All Forms		Refined Zinc	
	1945	1946	1945	1946
	(tons)			
January	24,674	20,700	16,789	15,068
February	22,189	19,733	15,330	14,340
March	23,773	21,306	15,841	15,804
April	21,624	20,630	14,402	15,935
May	22,641	20,288	15,940	16,305
June	21,665	19,473	15,202	15,779
July	22,527	19,617	15,657	15,965
August	20,695	19,424	15,089	15,973
September	19,168	19,127	14,220	14,970
October	19,368	18,268	14,363	15,002
November	20,240	18,357	15,010	15,014
December	20,043	18,367	14,474	15,528
TOTAL	258,607	235,310	183,317	185,683

Table 43 - REFINED NEW ZINC PRODUCED IN CANADA, 1937-1946

Year	Average price (x) per pound	Short tons	Year	Average price (x) per pound	Short tons
1937	4.90	158,542	1942	3.411	215,795
1938	3.07	171,932	1943	4.00	206,510
1939	3.07	175,641	1944	4.30	168,518
1940	3.411	185,722	1945	6.44	183,317
1941	3.411	213,608	1946	7.81	185,683

(x) In Canadian funds.

Table 44 - CANADIAN ZINC PRODUCTION (RECOVERABLE) ACCORDING TO NATURE OF ORES, BY PROVINCES, 1942-1946

Year and Province	Recovered from copper-gold-silver ores	Recovered from silver-lead-zinc and other ores (pounds)	TOTAL
1942 - Quebec	67,064,536	6,876,275	73,940,811
Ontario .....	...	4,710,394	4,710,394
Manitoba	29,908,179	...	29,908,179
Saskatchewan	84,461,520	...	84,461,520
British Columbia .....	...	387,236,469	387,236,469
TOTAL CANADA	181,434,235	398,823,138	580,257,373
1943 - Quebec	80,401,837	47,767,973	128,169,810
Ontario .....	...	3,299,812	3,299,812
Manitoba	46,783,873	...	46,783,873
Saskatchewan	96,350,404	...	96,350,404
British Columbia	461,776	335,688,679	336,150,455
TOTAL CANADA	223,997,890	386,756,464	610,754,354
1944 - Quebec	78,069,636	59,308,803	137,378,439
Ontario .....	...	2,429,176	2,429,176
Manitoba	45,822,278	...	45,822,278
Saskatchewan	87,130,087	...	87,130,087
British Columbia	1,953,077	276,110,296	278,063,373
TOTAL CANADA	212,975,078	337,848,275	550,823,353
1945 - Quebec	64,798,734	47,110,831	111,909,565
Ontario .....	...	237,799	237,799
Manitoba	34,860,754	...	34,860,754
Saskatchewan	75,413,851	...	75,413,851
British Columbia .....	...	294,791,635	294,791,635
TOTAL CANADA	175,073,339	342,140,265	517,213,604
1946 - Quebec	49,881,428	39,768,701	89,650,129
Ontario .....	...	42,628	42,628
Manitoba	35,580,537	...	35,580,537
Saskatchewan	71,077,110	...	71,077,110
British Columbia .....	...	274,269,956	274,269,956
TOTAL CANADA .....	...	470,620,360	470,620,360

Table 45 - PRODUCTION IN CANADA, IMPORTS AND EXPORTS OF ZINC, 1945 and 1946.

	1 9 4 5		1 9 4 6	
	Pounds	Value \$	Pounds	Value \$
Production -				
Quebec	111,909,565	7,206,976	89,650,129	7,001,675
Ontario	237,799	15,314	42,628	3,329
Manitoba	34,860,754	2,245,033	35,580,537	2,778,840
Saskatchewan	75,413,851	4,856,652	71,077,110	5,551,122
British Columbia	294,791,635	18,984,581	274,269,956	21,420,484
TOTAL	517,213,604	33,308,556	470,620,360	36,755,450

Table 45 - PRODUCTION IN CANADA, IMPORTS AND EXPORTS OF ZINC, 1945 and 1946 (Concluded)

	1945				1946			
	Pounds		Value		Pounds		Value	
			\$				\$	
Imports -								
Zinc dust	45,800		3,872		35,000		3,939	
Zinc in blocks, pigs, bars and rods, and zinc plates, n.o.p.	195,400		30,921		30,000		5,512	
Zinc in sheets and strips, and zinc plates for marine boilers	3,749,400		488,983		4,300,600		585,010	
Zinc slugs for dry batteries .....	...		...		...		146,272	
Zinc white (zinc oxide)	2,336,587		180,261		1,850,764		150,928	
Zinc sulphate	825,141		49,854		685,810		26,713	
Zinc chloride	270,925		16,532		543,183		29,761	
Zinc, manufactures of, n.o.p. ....	...		466,842		...		1,043,212	
Lithopone	20,334,132		1,017,275		17,716,626		878,781	
TOTAL .....	...		2,254,540		...		2,870,128	
Exports -								
Zinc, manufactures of .....	...		132,405		...		109,721	
Zinc, contained in ore	183,559,700		5,540,384		116,400,500		3,181,120	
Zinc, scrap, dross and ashes	13,771,900		577,679		7,495,200		303,626	
Zinc, spelter	243,920,400		14,122,706		289,792,900		24,174,704	
TOTAL .....	...		20,373,174		...		27,769,171	

Table 46 - CONSUMPTION OF REFINED ZINC IN CANADA, BY INDUSTRIES, 1942-1946

Industry	1942	1943	1944	1945	1946
	(Tons of 2,000 pounds)				
In brass foundries	38,494	42,158	28,189	16,520	16,687
In white metal foundries	13,290	8,898	5,229	5,566	5,406
In iron and steel (chiefly galvanizing)	22,762	16,336	19,400	19,000	16,310
In chemicals (zinc oxide, etc.)	8,022	10,344	10,960	12,006	13,566
In electrical apparatus	1,906	1,614	1,747	1,571	2,670
In non-ferrous smelters	181	194	206	200	160
In ammunition	181	917	1,478	600	...
In miscellaneous industries	55	138	150	200	170
TOTAL	84,891	80,599	67,359	55,668	54,959

Table 47 - PRODUCTION IN CANADA, IMPORTS, EXPORTS AND DOMESTIC CONSUMPTION OF REFINED ZINC, 1937-1946

Year	Production in Canada	Domestic consump- tion	Exports	Imports	Stocks (x) at end of period
	(Tons of 2,000 pounds)				
1937	158,542	23,119	134,189	...	Not
1938	171,932	18,692	132,212	...	avail-
1939	175,641	22,981	155,995	...	able
1940	185,722	36,913	167,073	1	10,028
1941	213,608	56,708	141,086	...	14,903
1942	215,795	84,000	152,159	58	9,080
1943	206,510	79,920	129,315	13	26,100
1944	168,518	69,030	95,985	4	33,220
1945	183,317	60,470	121,969	...	37,700
1946	185,683	54,969	151,885	...	23,265

(x) Producers' and consumers' stocks.

Table 48 - WORLD'S PRODUCTION OF ZINC SPELTER (a) 1940, 1944 and 1945 (AMERICAN BUREAU OF METAL STATISTICS)

Country	1940	1945	1946
	(Tons of 2,000 pounds)		
United States (b)	675,275	764,561	729,407
United States (c)	48,917	49,242	43,900
Mexico	36,817	53,901	53,311
Canada	185,809	183,589	185,692
TOTAL NORTH AMERICA	946,818	1,051,293	1,012,310
Belgium	41,654	12,000	89,231
Czechoslovakia	(d)	(f)	(f)
France	45,093	8,889	32,764
Germany (e)	350,090	...	18,000
Great Britain	66,167	69,483	73,199
Italy	43,362	1,669	17,202
Netherlands	5,566	...	2,217
Norway	18,992	12,120	34,204
Poland	(d)	39,700	63,529
Spain	13,583	19,082	19,042
Peru	196	1,571	1,446
Australia	81,425	93,826	85,474
French Indo-China	5,900	...	...
Rhodesia	14,773	17,067	19,250

(a) The statistics in this table are the summaries of production as made by the metallurgical works in the several countries.

(b) Production from ores, foreign and domestic.

(c) Production from secondary material.

(d) Included with Germany

(e) Germany includes production of Czechoslovakia and Poland.

(f) Not available.

CADMIUM - Cadmium is recovered from the silver-lead-zinc ores treated by the smelter of the Consolidated Mining and Smelting Company of Canada Limited, Trail, British Columbia, and from the copper-gold-zinc ores processed at the smelter of the Hudson Bay Mining and Smelting Company Limited, Flin Flon, Manitoba. Output in 1946 amounted to 469,982 pounds compared with 646,064 pounds in 1945.

Table 49 - CADMIUM RECOVERED FROM CANADIAN ORES, 1938 - 1946

Year	From copper-gold-silver-zinc ores	From silver-lead-zinc ores (pounds)	Total
1938	188,796	510,342	699,138
1939	140,438	799,253	939,691
1940	129,336	778,791	908,127
1941	169,917	1,081,374	1,251,291
1942	176,550	972,413	1,148,963
1943	187,938	598,673	786,611
1944	140,560	386,410	526,970
1945	135,632	510,432	646,064
1946	166,333	636,315	802,648

Note: Until 1936 cadmium was produced only in British Columbia; since 1936 the metal has been produced both at Flin Flon, Manitoba, and at Trail, British Columbia.

Table 50 - PRODUCTION IN CANADA, EXPORTS AND DOMESTIC CONSUMPTION OF CADMIUM METAL, 1937-1946

Year	Production	Domestic Consumption (Tons of 2,000 pounds)	Exports
1937	372	33	283
1938	349	23	233
1939	470	41	525
1940	454	75	399
1941	625	149	455
1942	574	207	400
1943	393	168	286
1944	263	108	192
1945	323	87	175
1946	401	96	296

LIST OF OPERATORS IN THE SILVER-COBALT MINING INDUSTRY, 1946

(x) Active but no shipments made.

Name of Operator	Head Office Address	Location of Mine
<u>Ontario -</u>		
Ausic Mining & Reduction Co. Ltd.	Box 643, Cobalt	Coleman Tp.
Casey Operation, The,	Box 450, Cobalt	Casey Tp.
Comet Leasing Co.	Box 274, Cobalt	Coleman Tp.
Conisil Mines Ltd. (x)	320 Bay St., Toronto	Cobalt
Cross Lake Lease (O'Brien)	Box 390, Cobalt	Coleman Tp.
Mayfair Mines Ltd. (x)	156 Yonge St., Toronto	Coleman Tp.
Nipissing Mining Co. Ltd., The (x)	302 Bay St., Toronto	Cobalt
Silanco Mining & Refining Co. Ltd.	7 Prospect Ave., Cobalt	Cobalt
Silco Mines Ltd.	67 Yonge St., Toronto	Gillies
Silver Arrow Mines Ltd.	85 Richmond St. W., Toronto	S. Lorrain
Siscoe Metals Ltd.	907 Dominion Sq. Bldg., Montreal, Quebec	Haultain Tp.

Note: In addition to the names listed, there were some small shippers.PRINCIPAL OPERATORS IN THE SILVER-LEAD-ZINC MINING INDUSTRY, 1946

(x) Active but not producing

Name of Operator	Head Office Address	Location of Mine
<u>Quebec -</u>		
Candego Mines Ltd. (x)	1085 Beaver Hall Hill, Montreal	Gaspe
Cameron, F. C. (x)	250 Park Ave., New York, N.Y., U.S.A.	Sherbrooke
Federal Zinc & Lead Co. Ltd. (x)	708 Drummond Bldg., Montreal	Lemieux Tp.
Golden Manitou Mines Ltd.	Room 1104 .. 30 Bay St., Toronto, Ontario	Bourlamaque Tp.
Gulf Lead Mines Ltd. (x)	330 Bay St., Toronto, Ontario	Hudson Bay
Lyall and Beidelman (x)	1117 St. Catherine St. W., Montreal	Gaspe
Mistassini Explorations Ltd. (x)	184 Bay St., Toronto, Ontario	Mistassini
Norzono-Rouyn Mines Ltd. (x)	67 Yonge St., Toronto, Ontario	Montbeillard Tp.
Shawinigan Mining & Smelting Co. Ltd. (x)	740A de l'eppe Ave., Outremont, Montreal	Portneuf Co.
<u>British Columbia -</u>		
Ainsmore Consolidated Mines Ltd.	Ainsworth	Ainsworth
Base Metals Mining Corp. Ltd.	350 Bay St., Toronto, Ontario	Field
Big Four Silver Mines Ltd. (x)	302 Royal Bank Bldg., Vancouver	Stewart
Cansil Consolidated Mines Ltd. (x)	711 Credit Foncier Bldg., Vancouver	Ferguson
Consolidated Mining & Smelting Co. of Canada Ltd.	Trail	Kimberley
Doney, Ernest (Victor)	Box 414, New Denver	Slocan, M.D.
Esperanza Mines Ltd. (x)	650 Columbia St., New Westminster	Portland Canal
Highland Silver Mines Ltd. (x)	404 Rogers Bldg., Vancouver	Beaverdell
Highland-Bell Ltd.	844 West Hastings St., Vancouver	Beaverdell
International Mining Corp. (Canada) Ltd. (x)	85 Richmond St. W., Toronto, Ontario	Kootenay
Esposito, V.	Salmo	Ainsworth
Ottawa Mining & Milling Co.	Empire State Bldg., Spokane, Wash., U.S.A.	Slocan
Santiago Mines Ltd.	423 Hamilton St., Vancouver	New Denver
Sheep Creek Gold Mines Ltd.	616 Stock Exchange, Vancouver	Zincton
Silver Ridge Mining Co. Ltd. (x)	Sandon	Slocan
Sylverite Mines Ltd. (x)	1155 West Pender St., Vancouver	Sandon
Torbrit Silver Mines (x)	350 Bay St., Toronto, Ontario	Alice Arm
Union Mine	Rossland	Rossland
Utica Mines (1937) Ltd. (x)	475 Howe St., Vancouver	Kaslo
Western Exploration Co. Ltd.	Silverton	Silverton

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