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THE POTENTIAL OF
RECO SILVER MINES LTD. (N.P.L.)

By: L.M. Jefferson

May, 1971

PROPERTY FILE

THE POTENTIAL OF

RECO SILVER MINES LTD. (N.P.L.)

MAY 1971

3192 West Eighth Avenue,
Vancouver 8, British Columbia.
May 5, 1971.

Mr. S.E. Cropper,
President,
Reco Silver Mines Ltd. (N.P.L.),
Suite 201,
535 Howe Street,
Vancouver 1, British Columbia.

Dear Mr. Cropper:

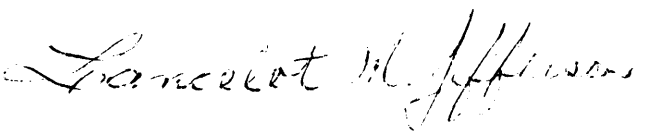
Reco Silver Mines Ltd. (N.P.L.)

I am pleased to enclose the original and two copies of the report requested by the Board of Directors entitled, "The Potential of Reco Silver Mines Ltd. (N.P.L.)."

This report is based on current data and knowledge. Mr. W.S. Ellis, the Company's mining engineer, was of invaluable assistance to me in obtaining various information.

I would like to take this opportunity to express my appreciation to you and your associates for allowing me to undertake this report.

Yours truly,



Lancelot M. Jefferson

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INTRODUCTION

A. RECO SILVER MINES LTD. (N.P.L.) - GENERAL BACKGROUND

Reco Silver Mines Ltd. (N.P.L.) was incorporated under a British Columbia charter in 1964. The President is S.E. Cropper, a respected and well-known mining and business executive.

The Company has an authorized capital of 10,000,000 shares with a one dollar par value.

Since the price of silver has been rising in recent years Reco Silver Mines Ltd. (N.P.L.) has acquired the majority of the mineral claims on the southern slope of Reco Mountain.

B. SCOPE AND PURPOSE OF THIS REPORT

These contents are intended to bring together in one report all useful information in assessing the present situation of Reco Silver Mines Ltd. (N.P.L.) and its properties and the prospects for future development.

C. THE AUTHOR OF THIS REPORT

This report was completed by Lancelot M. Jefferson who received a Bachelor of Commerce degree from the University of British Columbia, Vancouver, B.C., in 1965. After graduation he joined the economic branch of the Canadian Pacific Railway's Department of Research in Montreal. He transferred to the Vancouver office of Marathon Realty, a Canadian Pacific subsidiary, in 1968. His responsibilities included financial and economic studies for British Columbia, in that office and was Assistant to the General Manager. He is now operating independently in producing financial, market and economic feasibility studies.

D. DATE OF THIS REPORT

The collection of data for this report began on February 15, 1971. Information was gathered from governmental and other publications and from officers of the Company. Substantial completion of the report was made on April 8, 1971, and was finalized on May 5, 1971.

SECTION II

EXECUTIVE SUMMARY

A. SUMMARY OF MINING HISTORY IN THE SANDON AREA

Sandon is located in the Slocan Mining Division and the first discovery of silver-lead-zinc ore in the area was made by two prospectors at the top of Payne Mountain in the fall of 1891. Miners flocked to the area after the news of the discovery was announced and carried out their work underground by candlelight using picks and shovels. The ore was handsorted since the smelters placed penalties on lead and zinc. Partial payments were made for lead by 1894 but the penalty on zinc remained until World War One. Railway service into Sandon and Cody replaced packhorses in 1895.

The two principal mining companies that were predecessors of Reco Silver Mines Ltd. (N.P.L.) were the Noble Five Consolidated Mining and Milling Co. and the Reco Mining and Milling Co. From the spring of 1892 to the end of 1896 the total estimated value of shipments from the Noble Five company was $130,000. Shortly after this the company was acquired by the Hon. James Dunsmuir and surface improvements and an extensive mining programme were undertaken. Although much work was completed all operations on the property were suspended after the death of the Hon. James Dunsmuir. The Reco company was headed by John M. Harris. During the period 1894 to 1919 the company's shipments averaged 239 ounces of silver and 47.7 percent lead per ton. Zinc was not included in the shipments because of the penalties applied by the smelters, however, it was a large factor. Profits in those days were enormous and by January 1, 1898, the Reco company had declared dividends of $287,500.

Silver production from the Slocan reached a peak in 1918 but was still substantial until the depression of 1929. The rising price of silver after World War Two created a great deal of activity in the Sandon area and the two major producers of this period are the Victor and the Bluebell Mines.

B. SUMMARY OF THE SILVER-LEAD-ZINC MARKETS

1. The Silver Market

The principal silver markets are London and New York and most sales are covered by them. The price difference is essentially the rate of exchange and the cost of transportation. The Canadian price for silver is one-quarter of one cent below the official New York quotation converted into Canadian Funds. The average Canadian price of silver rose from $1.398 a troy ounce in 1966 to $2.313 in 1968 after the United States Treasury announced that it would restrict its sales of silver from its stockpiles to two million ounces per week at the market price. The price declined temporarily because

of the large amount of silver holdings and hoarded silver coins and the decrease in the use of silver-bearing coins. In 1971, the price of silver regained its earlier losses and on April 15, 1971, the U.S. price of silver was $1.734.

In 1969, Canada produced 43.1 million troy ounces of silver valued at about $83.2 million of which 12.6 percent came from British Columbia. Approximately 38.4 million troy ounces, or 89.2 percent, of Canada's silver production came from base-metal ores and about 4.2 million troy ounces, or 9.7 percent, came from silver-cobalt ores. There are six silver refineries in Canada and the only one in western Canada is the Cominco lead-zinc refinery located at Trail, British Columbia.

Canada exported 56.5 million troy ounces of silver in ores and concentrates with about 85.9 percent, or 48.5 million troy ounces, being shipped to the United States. Belgium and Luxembourg, West Germany and Japan each all imported more than one million troy ounces of silver from Canada. In 1969, Canada IMPORTED 19.2 million troy ounces of silver as refined metal with 99.8 percent coming from the United States. Most of the imports from the United States was made up of lower grade silver bullion and coins sent to Canada for refining and subsequent return to the United States.

The consumption of silver in Canada dropped to 5.7 million troy ounces of silver due to the elimination of silver in its coins by the summer of 1968. The world consumption of silver has exceeded production for a number of years. In 1968, this deficiency was 134.3 million troy ounces. The United States was the largest silver consuming country and in 1968 it had a deficiency of 149.4 million troy ounces over its production. The deficit was made up from imports, withdrawals from U.S. Treasury stocks, demonitized coinage and sales from speculative holdings. The United States imported 70.7 million troy ounces of silver of which Canada supplied 53.9 percent, or 38.1 million troy ounces. The United States has no tariffs on precious metal ores with a silver content or silver bullion. Although the world consumption of silver has declined in recent years demand will likely exceed production since the supply of silver is primarily dependent on the production of base metal ores.

2. *The Lead Market*

Sales of lead in Canada are made at prices quoted in cents per pound delivered at Montreal and Toronto. Sales abroad are based on the New York and London delivered price and the difference between these markets is primarily the cost of transportation and the rates of exchange. Since 1962, the consumption of lead has exceeded production in the Free World and this shortage resulted in an upward movement of prices. The average Canadian price of lead in 1962 was 9.92 cents per pound and by 1969 the price had climbed to 15.20 cents per pound.

Canada produced 317,537 short tons of lead in 1969 with 102,548 tons produced by British Columbia. There are only two lead refineries in Canada, the largest being the Cominco smelter at Trail, British Columbia, which has an annual capacity of 190,000 tons. Most of the lead ores from western Canada were treated at this smelter.

Consumption of lead in Canada has risen from 72,087 tons in 1960 to 107,270 tons in 1969. In 1969, Canada exported 24.8 million tons of lead ores and concentrates and 117,094 tons of lead metal. The largest importing countries of Canadian lead were the United States, which accounted for 45.1 percent of Canada's exports, the United Kingdom, Japan, West Germany, Belgium and Luxembourg.

In Canada the use of lead antiknock compounds in gasoline makes up about twenty-five percent of consumption. It appears reasonable to assume that governments will phase lead out of gasolines slowly so that growth in other uses of lead will offset any decreases experienced. Increased production from the New Missouri Lead Belt area will mean that there will be a decrease in demand for imported lead in the United States, however, future Canadian lead exports will readily find markets and one of the major importing countries will be Japan.

3. The Zinc Market

Canadian zinc sales are made at prices quoted in cents per pound of Prime Western grade zinc delivered at Toronto and Montreal. Sales abroad are based on the East St. Louis, Illinois, and overseas producer basic price. These have a minimum zinc content of 98 percent and premiums are quoted for higher grades and in Canada these are 0.6 cents a pound for High Grade and 1.0 cents a pound for Special High Grade. The principal difference between the prices of these markets is the cost of transportation and the rate of exchange. The price of zinc has not increased substantially since in 1960 the average Canadian price was 12.75 cents a pound and in 1969 the price was 14.67 cents a pound. New deposits of zinc are not being discovered and developed quickly enough for optimum smelter operation in the Free World and this can be attributed to the low price of zinc. Because the demand for zinc in the near future will be very strong the price can be expected to rise significantly.

Canada produced 1.3 million tons of zinc in 1969 and 148,128 tons of that total was produced in British Columbia. In 1969, the Canadian production of primary refined zinc was 466,351 tons of metal. Of Canada's four primary zinc plants only two, the Hudson Bay Mining and Smelting Co. Ltd.'s Flin Flon, Manitoba, plant and Cominco's Trail, British Columbia, plant, are located in western Canada. Canadian consumption of zinc rose from 55,803 tons in 1960 to 118,681 tons in 1969.

In 1969, Canada exported 804,664 tons of zinc ores and concentrates and 321,986 tons in metals. Approximately 48.1 percent of Canada's exports, or 541,569 tons, went to the United States. Other important importers of Canadian zinc were Belgium and Luxembourg, West Germany, the United Kingdom, Japan and France.

Within the next few years a large number of new smelters will be put into operation in the Free World, especially in Japan and Europe, areas that are deficient in zinc ores. This will result in an increased demand for Canadian zinc ores and concentrates.

C. SUMMARY OF RECO SILVER MINES LTD. (N.P.L.)

1. The Properties

The property owned, optioned or leased by Reco Silver Mines Ltd. (N.P.L.) consist of three groups all located in the Slocan Mining Division about one mile east of Sandon. The Reco Group consists of twenty-six Crown Granted Claims and twelve located Claims. The Vespar Group consists of twenty-one Crown Granted Claims and the Bluebird Group is made up of nine Crown Granted Claims.

Reco Silver Mines Ltd. (N.P.L.) owns or has under lease the majority of claims on the south side of Reco Mountain. Included in this company's property are a number of mines that have been good proven producers in a period when manual mining methods were used.

2. Development Work to Date

A considerable amount of work preparatory to underground exploration has been carried on intermittently since 1964 on a near-continuing basis. Over a mile of new roads were built and a further mile was improved. Surface exploration included diamond drilling, soil sampling, tunnel prospecting, hand trenching, bull-dozer stripping and underground drifting. A full topographical survey and surface and underground surveying of the property has been completed. Many of the accessible mine workings have been geologically mapped. Three thousand feet of baseline have been cut and over fifteen thousand feet of crosslines and several miles of transit surveys have been completed on mining grids. Several hundred soil samples have been taken in geochemical survey-ing on established grids. Eight adits of mines have been reopened.

This work was completed for examination and sampling prepara-tory for underground exploration. Mineralization was located in the old workings. A fault of major proportions has been located and new mineralization discovered. A considerable amount of surface stripping by bulldozer has been undertaken, particularly in the

region northwest of the Number Two Claim. A vein structure was disclosed in this area which was believed to be an extension of The Deadman Vein. The portal of the Chambers 4785 tunnel was re-opened and timbered. Drifting was completed for 254 feet at the present face. Construction at this site included a change house and a powder house.

3. Access and Services

Reco Silver Mines' property is located within twelve miles of New Denver, 450 miles east of Vancouver. The road between New Denver and Cody is primarily graded. Daily scheduled airline service is available between Vancouver and Castlegar, sixty miles south of New Denver.

New Denver, on Slocan Lake, has a population of about eight hundred persons. It is a complete service centre in that there are a number of stores, a few hotels and motels, a hospital, a post office and two sawmills.

Temperatures at Sandon range from -10°F. in winter to 75°F. in summer. Snow falls in October and disappears in May. The base elevation of Sandon is 3,550 feet above sea level, and Cody is at 4,000 feet. Reco Silver Mines' property is located at an elevation of from 4,000 to about 8,000 feet. Carpenter Creek flows west into Slocan Lake and it has a number of tributaries above Sandon and Cody. Good timber grows to about the 5,500 foot elevation.

4. Development Results

The Chambers Vein has a known location at an elevation of about 4,600 to 4,900 feet and is in a strong wide structure. It has an east-north-east strike and a southward dip of fifty to eighty degrees. Surface channel sampling to date indicates an average width of 1.76 feet and the gross value of the contained metals averaged $127.00 per ton. Mineralization ahead of the drift was disclosed by diamond drilling and indicated a vein width of more than twenty feet. The geological conditions are such that the Chambers Vein has an excellent chance of being developed into a major lode.

Two veins of moderate structure were discovered on the Kaslo Claim. Assaying on the newer vein showed 2.3 ounces of silver per ton. It is felt that this vein is a subsidiary to a main northeast striking vein.

The downward continuation of the ore mined above the No. 3 Level is the most apparent exploration opportunity in the Number One Mine. Exploration could be carried out from the No. 4 Level or by extending the No. 16 Level. The No. 16 Level follows a subsidiary quartz vein, the 'A' Vein, in a strong structure. At its present strike, the 'A' Vein will intersect the Main Lode about 160 feet ahead of the present face and about eighty feet below the No. 3 Level. Exploration of these areas would be extensions of known ore bodies.

A long range target has the potential of finding a new ore body between the Number One Mine and the Number Three (or Reco-Goonenough) Mine. The present face of the No. 2 Level is in good structure and its last two hundred feet has mineralization that approaches commercial values.

It is felt that the discovery of a new ore body at depth is a distinct possibility at the east end of the No. 5 tunnel in the Number Two Mine. High silver to lead ratios are found at depth in the Number Three Mine. The Noble Five Mine has good possibilities since 21,100 tons of ore were mined and milled from two ore bodies which graded 13.35 ounces of silver, 6.55 percent of lead and 7.75 percent of zinc per ton. The mine closed in 1930 after the drastic fall in metal prices during the Depression.

A composite sample of surface float from the Purcell Claim assayed 433.2 ounces of silver and 68.58 percent of lead per ton. The favourable area appears to be from 270 to 430 feet to the northeast of the tunnel portal and about 250 to 300 feet below the surface.

There are many other known veins in Reco Silver's property. Some of them have been former producers and others have known mineralization yet to be developed. The more prominent are some of the following and they include the Ruby Silver No. 1 and Ruby Silver No. 2 on the Maud E claim. There is the Galena Vein to the northwest of the Last Chance (Surprise) Vein; the Deadman Vein strikes into the Reco ground on the northeast as well as the southwest extension. The Bluebird Vein is on strike into the Pirate Claim. There is considerable ground on strike of these various veins yet to be worked as well as almost 2,000 feet of backs on each of the vein systems. The opportunity is therefore extensive for continued vein development.

5. *Exploration and Development Costs*

The cost factors through to production are constantly changing in the development of a mine. It is for that reason in this analysis it would be premature to itemize individually the exploration and development costs of the many Reco Silver veins and their potential ore bodies. Consequently these estimates are best left to progressive and subsequent engineering reports.

6. *Proximity to Other Mills and Lead-Zinc Smelters*

Mills are located at Sandon and two others at Silverton, fifteen miles from Reco Silver's property. Smelters are located at Trail, British Columbia, eighty-five miles south of Sandon, and Kellogg, Idaho, three hundred miles distant.

D. *SUMMARY OF THE POTENTIAL OF RECO SILVER MINES LIMITED (N.P.L.)*

The average Canadian price of silver has risen significantly since 1961 and reached an average high of $2.313 in 1968. The price declined temporarily in 1969 and 1970, however, during the first few months of 1971 the price recovered and on April 15, 1971, the U.S. price was $1.734 per troy ounce. As silver inventories decline the economic law of supply and demand will force the price of silver upwards since the demand for silver exceeds production.

Reco Silver's property has a known history of production of silver, lead and zinc. The existence of many veins in a favourable geological formation indicates that the opportunity for Reco Silver to develop mineable ore on a commercial basis are extremely good. Reco Silver Mines Ltd. (N.P.L.) has an excellent potential due to its known geology and the large number of strong veins carrying excellent silver-lead-zinc ratios. The competency of the ground, the accessibility of the many veins, the availability of good water and timber and its nearness to a major smelter should make the Reco Silver property attractive to both producers and investors.

SECTION III

A HISTORY OF MINING IN THE SANDON AREA

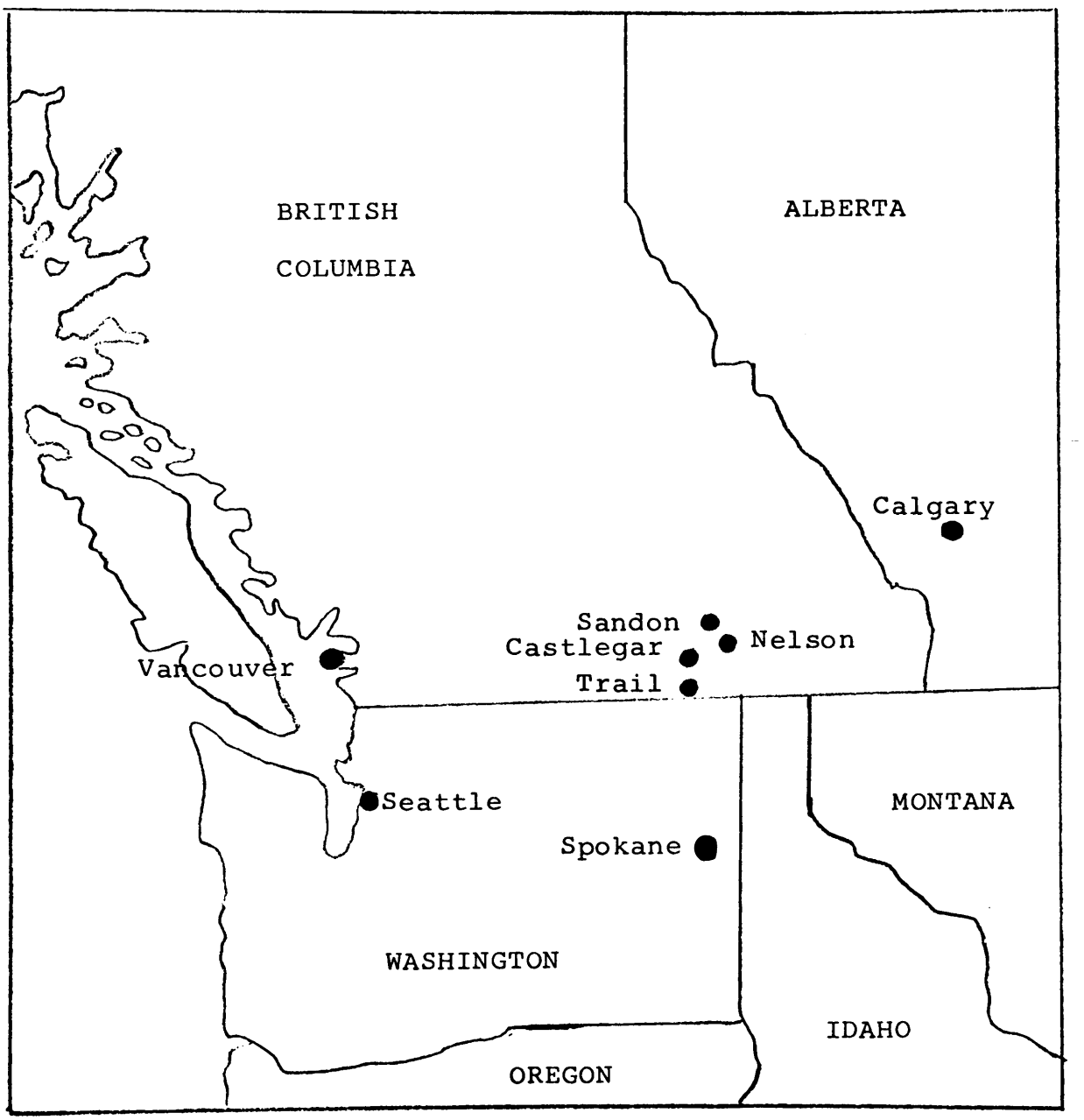
A. A HISTORY OF MINES AND PRODUCTION

Sandon is located in the Slocan Mining Division and its location is shown in Figure 1. The history of mining in the Sandon area is both old and new. The discovery that led to the founding of Sandon came about as two prospectors, Eli Carpenter and John Seaton, were returning to Ainsworth during the fall of 1891 after an uneventful exploration trip north of Slocan Lake. At the top of Payne Mountain they found outcrops of a high grade vein of silver and took the samples into Ainsworth for assaying. Without Seaton's knowledge Carpenter had switched samples and Seaton was later informed that after analysis they were of low grade. Carpenter headed back to the Payne Mountain area secretly in the company of John Sandon and others. Shortly after this Seaton, Bill Hennessey, Frank Flint, Jack McGuigan and Jack Hennessey formed a partnership called the Noble Five. They located the famous claim the Noble Five which started the silver rush to the Slocan. Some of the other famous discoveries made in the area include the Rambler-Cariboo, Wonderful, Ruth-Hope and Silversmith.

In those early days the miners carried out their work underground by candlelight using picks and shovels. The ore was sorted by hand and zinc ores with low silver values were discarded since penalties were placed on zinc by the smelters. By 1894 partial payments were made for lead in the ore but the penalty for zinc remained until the First World War. The steep terrain of the area made transportation difficult. The silver ore was placed in sacks and horses or mules dragged or carried it down trails to the wharves at New Denver. From there it was taken to the head of Slocan Lake and then packed over to Nakusp where the steamboats carried it to the railway lines for forwarding to the American smelters. The town of Sandon was established as a result of the rapid growth of mining activity in the area and the resultant need for distribution, provisioning and administrative services. The first railway line into Sandon was the Kaslo & Slocan Railway, a three foot narrow guage Great Northern Railway subsidiary. It completed its 28.8 mile line into Sandon and a 3 mile branch was extended into Cody in 1895. The Canadian Pacific Railway's subsidiary, the Nakusp & Slocan Railway, started building from Nakusp in 1893 and reached Three Forks in 1894. It later constructed

Figure 1

Location Map of Sandon, British Columbia



its line into Sandon. The settlement of Cody developed since it was closer to some large producing mines but was easily eclipsed by Sandon and soon passed out of existence. There were two principal mining companies that were predecessors of Reco Silver Mines Ltd. (N.P.L.), the Noble Five Consolidated Mining and Milling Co. and the Reco Mining and Milling Co., Ltd.

The Noble Five Consolidated Mining and Milling Company commenced mining operations in the spring of 1892 and opened its mill at Cody in 1896. The total estimated value of shipments to the end of 1896 was $130,000. The control of the Company was acquired by the Hon. James Dunsmuir, former Premier and Lieutenant Governor of British Columbia and also son of the coal mining baron Robert Dunsmuir, about 1905. After this surface improvements and mining programme were undertaken, which included:

- a 2,700 foot crosscut was completed, at the Vespar No. 18 level, to tap the Noble Five lode 1,000 feet below the lowest workings on the No. 8 level.

- 2,000 feet of drifts were run along two different veins from the No. 18 level.

- the construction of a 1,000 foot verticle three compartment shaft from near the face of the No. 18 crosscut to the No. 8 level above.

- intermediate levels were driven from the 1,000 foot raise.

- the reconstruction of the aerial tramway.

- the construction of a new mill at Cody.

- the construction of a penstock and flume.

Water was taken from Carpenter Creek to drive the mill and an air compressor. Despite all of this preparation, operations on the property were suspended only three months after the mill was completed because of the death of the Hon. James Dunsmuir.

Another of the early mining partnerships was formed by John M. Harris and Fred T. Kelly. They purchased the Clifton, Texas, Ephraim, New Denver and Ruecau claims which were

alongside the Noble Five group of claims from a prospector named Ruecau. The Ruecau group was renamed Reco and after purchasing other claims they formed the Reco Mining and Milling Company. The No. 3 vein, which proved to be the richest vein ever found in the Slocan, had been discovered and was mined on the Reco and adjoining Goodenough claims. The smelter returns for the ore shipments by the Reco Mining and Milling Company are presented in Figure 2. Shipments from the Reco property during this period averaged

Figure 2

SMELTER RETURNS OF ORE SHIPMENTS BY THE RECO MINING AND MILLING COMPANY, LTD. ON THE RECO SILVER PROPERTY

YEAR	Weight Lbs.	Silver Ozs.	Lead Lbs.	$Returns Per Year
1894	146,436	12,892.64	111,018	7,100.91
1895	636,313	79,458.51	274,882	45,448.53
1896	856,557	129,696.36	312,750	79,018.65
1897	2,736,948	204,345.25	1,134,582	233,209.92
1898	1,086,755	107,515.53	341,516	57,706.38
1899	488,354	44,420.54	143,452	23,062.91
1900	43,426	4,558.19	21,681	2,747.11
1901	617,878	54,043.00	333,301	28,806.88
1902	1,071,901	128,098.90	643,207	62,779.52
1903	279,325	33,155.09	166,327	16,767.14
1904	1,896,544	116,037.73	816,265	61,073.15
1905	1,294,461	79,602.31	600,108	45,338.28
1906	558,899	29,146.21	272,023	20,111.64
1907	227,977	13,442.29	73,358	6,723.58
1908	1,007,493	65,877.54	405,433	31,561.82
1909	1,667,013	92,103.26	663,627	46,436.33
1910	13,918	864.31	6,458	455.49
1911	41,552	1,988.26	20,111	1,164.11
1912	331,516	22,503.92	214,317	17,576.79
1913	154,717	10,440.97	95,103	7,700.45
1915	141,037	15,399.08	85,006	9,573.48
1916	216,149	11,682.28	92,512	12,517.42
1917	76,421	5,579.92	33,693	6,521.91
1918	73,961	3,318.76	17,010	4,023.52
1919	37,052	1,651.50	4,600	1,677.07

Source: The Reco Silver Story

239 ounces of silver and 47.7 percent lead per ton. Zinc was a large factor but was not included in the shipments or any of the records due to the penalties applied by the smelters on zinc. Profits were enormous and it is worth-

while to present a paragraph from the Minister of Mines Annual Report for 1897, demonstrating this and it referred to the Reco Mine's No. 3 Vein.

'On this mine work has been confined to 'one' vein, nothing further having been done on the 'other veins'. ..... A dividend of $100,000 was declared January 1st, 1898, making $287,500 in all, and another to follow. Mr. Harris was also prospecting several claims adjacent.'

Silver production from the Slocan reached a peak in 1918 but was still substantial until the depression of 1929 which almost brought a complete cessation of activity in the Sandon area. The Victor property was acquired by Violamac Mines (B.C.) Ltd. in 1948 and it soon became very profitable. The big operations at the Victor Mine continued until 1960. More details on the Violamac operations will be provided in Section VI of this report. This postwar period was one of great activity in the area and many of the mines' old ore dumps were being worked over, properties were being mined and a considerable amount of exploration was being carried on. Since that time mining and exploration activity has continued intermittently. Up to the end of 1969 at present prices the value of mining production from the Slocan would amount to more than $420 million.

Figure 3 is a table of shipments made from the Slocan Mining Division showing every fifth year for the years 1895 to 1969.

Figure 3

SHIPMENTS FROM THE SLOCAN MINING DIVISION

YEAR	Tons of Ore Shipped	Silver Ounces	Lead Pounds	Zinc Pounds
1895	9,514	1,122,770	9,666,324	-
1900	25,520	2,121,176	19,565,743	-
1905	88,279	1,045,948	5,399,330	-
1910	44,466	964,634	6,406,358	-
1915	114,292	1,812,550	14,925,345	8,684,572
1920	59,768	738,515	6,135,581	3,715,471
1925	64,838	865,833	4,910,485	4,504,478
1930	n.a.	137,923	1,200,711	774,818
1935	n.a.	408,791	2,841,223	1,550,196
1940	n.a.	n.a.	n.a.	n.a.
1945	n.a.	166,915	901,541	12,890,421
1950	n.a.	451,279	4,184,153	10,451,715
1955	n.a.	846,858	36,168,405	29,250,939
1960	n.a.	521,900	26,303,094	27,038,893
1965	n.a.	593,235	25,482,463	29,868,871
1969	237,492	483,451	21,260,240	25,213,795

n.a.= not available
Source: British Columbia, Minister of Mines Annual Reports

Although the annual production of silver in the Slocan seems to be fairly constant at about 500,000 ounces most of it comes from Cominco Ltd.'s Bluebell Mine at Riondel which has been in large scale production since 1952. Silver production in the Sandon area has followed the price of silver so that in recent years as the price of silver has been climbing mining activity has increased as well.

B. GEOLOGY

A considerable amount of geological work has been carried out in the Slocan Mining Camp and much of it in the Sandon area. Mr. R.G. McConnell completed the first geological work in the camp during the years 1894 and 1895 and the findings were included in the West Kootenay Sheet published in 1904. In 1896, Mr. W.A. Carlyle, the Provincial Mineralogist, produced the first technical account of the camp. A number of properties were described in the Zinc Commission's report published in 1906. In 1908, Mr. O.E. Leroy made the first of many visits to the Slocan and later Mr. C.W. Drysdale carried on his work. Further investigations were made in 1917 and 1919 by Mr. M.F. Bancroft. Dr. C.E. Cairnes of the Canada, Department of Mines' Geological Survey, made property examinations and carried out geological mapping from 1925 to 1928 in the camp. This work was published in 1935 and 1935 as Memoirs 173 and 184, Descriptions of Properties, Slocan Mining Camp, British Columbia. These two volumes are regarded as the definitive works on the Slocan Mining Camp and describes properties in the Sandon area that have been caved for many years. The British Columbia Department of Mines' Dr. M.S. Hedley undertook field work in the Sandon area during the years 1946 to 1950 and this was published in 1952 as, Bulletin No. 29, Geology and Ore Deposits of the Sandon Area, Slocan Mining Camp, British Columbia. This work is considered to be the basic reference on geological structure and structural ore controls in the Sandon area. Dr. J.W. Ambrose, Consulting Geologist, completed a geological examination of the Noble Five Group of mineral claims in 1951. Detailed mapping of the surface of the Reco Group was undertaken by Mr. S.S. Tan, a graduate geological student, during the summer of 1965.

About 1968, Mr. John Lamb, Consulting Geologist, mapped and reported on the underground workings of the Reco Number

One and Chambers Mines and the following is extracted from his report.

The Reco Mountain area is underlain by steep beds of Slocan sedimentary rock, interleaved with a host of sill-like quartz feldspar porphyries, most of which are concordant with the bedding. These formations all have a northwest trend. While both east and west dips are present, that predominating over the 4,000 foot vertical range of the mountain is steep easterly.

The porphyritic intrusives because of their white to pale brown shades, are in sharp contrast to the darker coloured sediments, chiefly argillite, with minor quartzite and limestone.

The lodes are northeast striking, southward dipping tear faults, that cross the bedrock trend almost at right angles. Lead-zinc mineralization is confined to these lode zones and to a few northward trending subsidiary shears, which form cross links between lodes.

From top to bottom, the south slope of Reco Mountain is crossed by ten known, sub-paralled lode zones. The Chambers lode near the south end, close to the base of the mountain, is not as well explored as those higher up.

While mineralization may exist over long distances in a lode zone, it usually forms a mineable orebody, only at certain favoured locations, where the right combinations of physical and chemical controls exist.

Experience in the Slocan Mining Camp suggests some of the following:

1. Rocks of suitable competence; that is those in which lode movement will create and maintain openings during the period in which mineralization is being introduced. One would not expect soft slates to be competent in this matter, as their tendency would be to twist and shear and close up any potential opening. A mixture of argillite and quartzite, possibly stiffened by porphyry sills, would be a more competent rock;

2. Rocks, whose bedding attitudes stand opposed to the movement direction of a lode, which in the Slocan is usually for the hangingwall to move eastward and downward. This means the rocks

whose bedding is steeply westward, would be in the most favourable position.

3. Suitable fold structures in the enclosing rocks, where the folding stresses would be more likely to assist the formation of openings;

4. Changes in direction or dip of the lode, which again would tend to create openings where relative movements of hangingwall and footwall of the lode would be most highly opposed to one another;

5. A combination of pressure and temperature, at which precipitation of the ore minerals from their liquid or gaseous forms would be possible.

Competent rocks are rare in the Slocan but are found on Reco Silver Mine's property due to the interbedding which has substantially firmed up the ground.

SECTION IV

THE SILVER-LEAD-ZINC MARKETS

A. THE SILVER MARKET

1. The Price of Silver

The world's principal silver markets are London and New York and most sales are covered by the prices they establish. In the last few years the price difference between the two markets has been small. The London price is slightly higher than the New York price and this difference is accounted for by the cost of shipping silver from the America's to the United Kingdom. The Canadian price of silver is essentially the New York price with the main difference being the exchange rate. Effective August 2, 1962, the price for silver is one-quarter of one cent below the official New York quotation converted into Canadian Funds for fine silver. Figures 4 and 5 present the average annual Canadian price for silver for the years 1900 to 1970 in current dollars.

Figure 4

Average Annual Canadian Price of Silver

(Current Dollars)

Year	Price Per Troy Ounce $	Year	Price Per Troy Ounce $
1900	0.6133	1918	0.9684
1901	0.5895	1919	1.1112
1902	0.5216	1920	1.0090
1903	0.5345	1921	0.6265
1904	0.5722	1922	0.6753
1905	0.6035	1923	0.6487
1906	0.6679	1924	0.6678
1907	0.6533	1925	0.6907
1908	0.5286	1926	0.6211
1909	0.5150	1927	0.5637
1910	0.5349	1928	0.5818
1911	0.5330	1929	0.5299
1912	0.6083	1930	0.3815
1913	0.5979	1931	0.2987
1914	0.5481	1932	0.3167
1915	0.4968	1933	0.3783
1916	0.6566	1934	0.4746
1917	0.8142	1935	0.6479

Year	Price Per Troy Ounce $	Year	Price Per Troy Ounce $
1936	0.4513	1954	0.8329
1937	0.4488	1955	0.8814
1938	0.4348	1956	0.8970
1939	0.4049	1957	0.8743
1940	0.3825	1958	0.8678
1941	0.3826	1959	0.8779
1942	0.4217	1960	0.8892
1943	0.4525	1961	0.9439
1944	0.4300	1962	1.165
1945	0.4700	1963	1.384
1946	0.8365	1964	1.399
1947	0.7200	1965	1.398
1948	0.7500	1966	1.398
1949	0.7432	1967	1.720
1950	0.8098	1968	2.313
1951	0.9440	1969	1.896
1952	0.8355	1970	1.700 (at June 30)
1953	0.8403		

Source: Years 1900 - 1961: J.W. Patterson, Silver in Canada, Canada, Department of Mines and Technical Surveys, Mineral Resources Division, Mineral Survey 3, 1961.

Years 1962 - 1970: Canadian Mines Handbook Northern Mines Press Ltd., Toronto, Ontario.

The price advances of silver can be followed by using Figure 5 and the letters denoting the price changes.

A - During 1906, large purchases of silver were made by India on the London market and there was an increased demand for silver by the U.S. Mint and in arts manufacture.

B - In 1912, large purchases of silver were made by India on the London market.

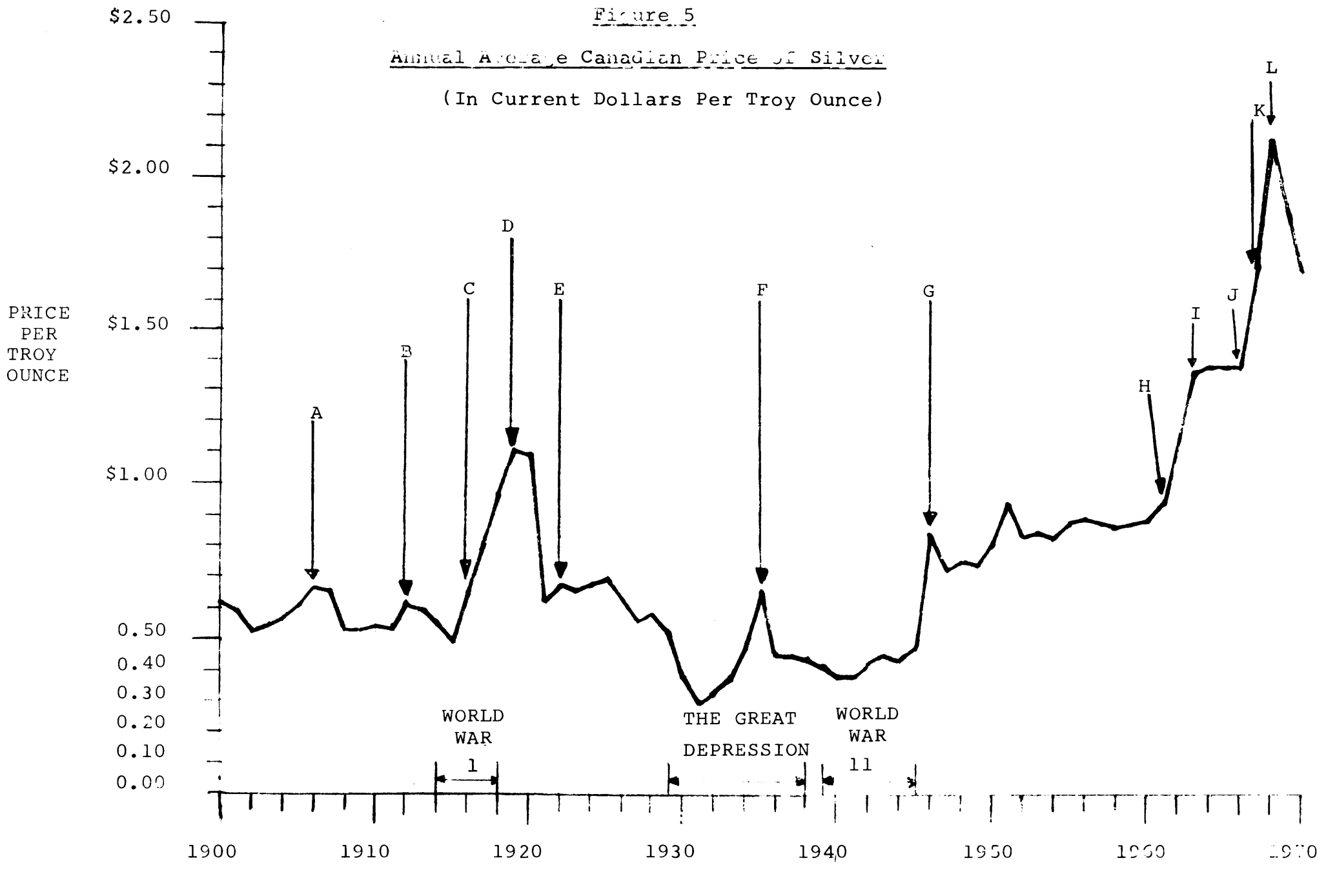
C - In 1916, the Allies required more silver for coinage as a result of World War I.

D - In 1919, China made large purchases of silver in the United States.

Figure 5

Annual Average Canadian Price of Silver

(In Current Dollars Per Troy Ounce)



E - In 1922, the U.S. Government purchased 200 million ounces of silver.

F - In 1935, there were heavy speculative purchases of silver in the United States following increases in the U.S. Government purchase price.

G - In 1946, the U.S. Treasury and the Canadian Government removed wartime controls and the U.S. Treasury increased its purchase price to 90.5 cents.

The most significant increases in the price of silver have occured since 1960 and detailed explanations are presented, as follows:

H - President Kennedy announced on November 28, 1961 that the Treasury Department was immediately suspending its sales of free silver to commercial buyers and that in the future silver used in coinage would be obtained by taking the required number of five and ten dollar silver certificates out of circulation. This resulted in a sharp rise in the price of silver. The Canadian price of silver rose from 95.88 cents on November 28, 1961 to 105.75 cents on November 29. The price of silver closed at the year end at 110.00 cents and the annual average price for 1961 was 94.39 cents.

I - The United States passed a bill on June 4, 1963 which repealed the Silver Purchase Acts, freed silver from Governmental controls, authorized the replacement of the smaller denomination silver certificates with Federal Reserve notes and removed the transfer tax on silver bullion. The result of this was that the 1.7 billion ounces of silver held by the United States as backing for the silver certificates was made available at the statutory price of $1.2929 an ounce. Since silver was in short supply and because silver can be freely exported from the United States prices soon reached the statutory price of $1.2929 an ounce. In September, the Treasury Department made its first exchange of silver bullion for silver-backed certificates which were then withdrawn from circulation. The average Canadian price of silver in rose to $1.165 in 1962. This price was based on the U.S. statutory price and remained in effect until July 14, 1967.

J - In July, 1965, the Coinage Act of 1965 was passed by the United States which eliminated silver from dimes and quarters and reduced the silver content of half-dollars to forty percent. The new coins were first issued in November 1965.

K - From July 1967 to April 1968 there was a nationwide strike in the non-ferrous smelter and refinery industry in the United States. Japan, Canada and other countries started to replace their silver coinages. On May 18, 1967, the U.S. Treasury discontinued sales of silver to foreign buyers. Public Law 90-29, the silver certificate legislation was passed on June 24, 1967, which meant that silver certificates would not be redeemable in silver after June 24, 1968. This law also directed the Treasury to hold not less than 165 million ounces of silver in reserve by June 24, 1968, for transfer to the strategic stockpile. On July 14, 1967 the Treasury Department announces that it would restrict its sales of silver from its dwindling stocks to 2 million ounces per week and at the going market rate, not at $1.2929 per ounce. The result was an increase in the price of silver. The average Canadian price of silver rose from $1.398 in 1966 to $1.720 in 1967 and $2.313 in 1968.

L - On May 12, 1969, the U.S. Treasury removed the ban on private melting and exporting of silver coins. Effective May 27, 1969, the U.S. Treasury Department reduced the amount of silver offered for sale at its weekly auctions from 2 million to 1 million ounces. The auctions were also opened up to foreign bidders.

At June 30, 1970, the Canadian price for silver was $1.70 per troy ounce, a decrease from the 1969 annual average of $1.896. The U.S. Treasury ceased selling of silver from its stocks on November 10, 1970. As a result of the large amount of silver holdings and hoarded silver coins the price of silver declined somewhat. In the early months of 1971 the price of silver recovered from its temporary decline and on April 15, 1971, the U.S. price for silver was $1.734 per troy ounce.

2. Silver Production, Consumption and Trade

In 1969, approximately 43.1 million troy ounces of silver valued at about $83.2 million was produced from Ca-

nadian mines. This was approximately two million troy ounces lower than the all-time high of 1968 and about twenty percent less in value. Lower output from several base-metal mines in British Columbia and a silver-copper mine in the Northwest Territories accounted for most of the decrease. Figure 6 presents the production of silver for 1969 by province.

Figure 6

Canadian Silver Production By Province, 1969

Province	Troy Ounces	Value -$-
Ontario	22,033,095	42,523,373
British Col.	5,431,267	10,482,345
New Brunswick	4,172,200	8,052,346
Quebec	4,103,420	7,919,600
Yukon Territory	2,990,056	5,770,808
Northwest T.	2,026,513	3,911,170
Newfoundland	963,100	1,858,783
Saskatchewan	636,906	1,229,229
Manitoba	489,345	944,436
Nova Scotia	247,064	476,834
Alberta	10	19
TOTAL	43,092,976	83,169,443

Source: J.G. George, Silver 1969, Department of Energy, Mines and Resources, Mineral Resources Branch, Report No. 46.

The data for 1969 is the preliminary data for the year released by the Federal Government.

About 38.4 million troy ounces, or 89.2 percent, of Canada's silver production in 1969 came from base-metal ores and approximately 4.2 million troy ounces, or 9.7 percent, came from silver-cobalt ores. The balance of about half a million troy ounces was byproduct recovery from lode and placer gold ores. Silver is obtained from six refineries in Canada and these are given in Figure 7.

Figure 7

Canadian Silver Refineries

Refinery	Location	Source of Silver	1969 Production (Troy Ounces)
Canadian Copper Refineries Ltd.	Montreal East, Quebec	Anode and blister copper	12,360,000
Cominco Ltd.	Trail, British Columbia	Lead-zinc ores and concentrates	n.a.
East Coast Smelting and Chemical Co.Ltd.	Belledune, New Brunswick	Lead-zinc concentrates	n.a.
The International Nickel Co.of Canada Ltd.	Deloro, Ontario.	Nickel and copper concentrates	n.a.
Kam-Kotia Mines Ltd.	Cobalt, Ontario.	Silver-cobalt ores	19,970,876
Royal Canadian Mint	Ottawa, Ontario.	Gold bullion	n.a.

n.a.= not available
Source: Ibid.

Exports from Canada of silver in ores and concentrates and as refined metal in 1969 was 56,541,965 troy ounces with about 85.9 percent, or 48,541,121 troy ounces, being exported to the United States, Figure 8 presents Canada's 1969 exports of silver by importing country.

Figure 8

Canadian Silver Exports By Importing Country,1969

(Troy Ounces)

Importing Country	In Ores and Concentrates	Refined Metal	Total
United States	15,141,088	33,400,033	48,541,121
Belgium and Luxembourg	2,720,379	825,342	3,545,721
Japan	1,919,768	n.a.	1,919,768
West Germany	1,547,458	396,055	1,943,513
Other Countries	554,335	37,507	591,842
TOTAL	21,883,028	34,658,937	56,541,965

Source: Ibid.

Canada IMPORTED 19,168,785 troy ounces of silver in as refined metal in 1969 with 99.8 percent coming from the United States and very small amounts coming from the United Kingdom, Mexico and Bolivia. Lower grade silver bullion and coins sent to Canada for refining and subsequent return to the United States made up much of the imports from the United States.

Consumption of silver, including consumption for coinage, dropped markedly to 5,747,068 troy ounces in 1969, compared to previous years, as shown in Figure 9.

Figure 9

Consumption of Refined Silver in Canada

Years	Consumption (Troy Ounces)	Years	Consumption (Troy Ounces)
1960	11,742,064	1965	30,170,097
1961	9,614,083	1966	21,303,704
1962	15,419,342	1967	14,576,608
1963	17,574,628	1968	13,598,358
1964	18,775,307	1969	5,747,068

Source: Ibid.

Canada decreased the amount of silver required for coinage in 1966 and in 1967 the Royal Canadian Mint suspended temporarily its production of silver and half dollars. In September 1967 the silver content of all other Canadian coins was reduced from eighty percent to fifty percent and effective August 1968, only pure nickel coins were minted resulting in a further decrease in Canadian silver consumption.

For a number of years the consumption of silver has exceeded production, as shown in Figure 10.

Figure 10

World Production and Consumption of Silver

(Millions of Troy Ounces)

Year	Production	Consumption	Deficiency in Production
1964	248.5	566.3	317.8
1965	257.4	717.7	460.3
1966	266.7	485.8	219.1
1967	259.1	437.8	178.7
1968	272.5	406.8	134.3

Source: J. Patrick Ryan, Silver, 1968, United States Department of the Interior, Bureau of Mines.

In 1968, this gap was estimated at 134.3 million troy ounces. Despite the fact that in recent years countries other than Canada, such as France, Sweden and the Netherlands replaced their silver-bearing coins with pure nickel or base-metal alloy coins demand still exceeded production. In 1968 the United States, the largest silver consuming country required 182.1 million troy ounces but its production was only 32.7 million troy ounces. This large deficit was made up from imports, withdrawals from U.S. Treasury stocks, demonitized coinage and sales from speculative holdings. The United States imported 70.7 million troy ounces of silver of which Canada supplied 38.1 million troy ounces, or 53.9 percent of the United States' imports. Mexico and Peru supplied about 14.6 and 8.2 percent respectively of the imports. The United States has no tariffs on precious metal ores with a silver content or silver bullion. Although the world consumption of silver has declined in recent years demand will likely exceed production since the supply of silver is primarily dependent on the production of base-metal ores.

B. THE LEAD MARKET

1. The Price of Lead

Sales of lead in Canada are made at prices quoted in cents per pound delivered at Montreal and Toronto. Sales of lead abroad are based on the New York delivered price in the United States and the settlement and cash seller's price on the London Metal Exchange in the United Kingdom. The difference in the price of lead between these markets is principally the cost of transportation and the rates of exchange. Figures 11 and 12 present the average annual Canadian price for lead for the years 1946 to 1970 in current dollars.

Figure 11

Average Annual Canadian Price of Lead

(Current Dollars)

Year	Price Per Pound ¢	Year	Price Per Pound ¢
1946	5.00	1949	15.54
1947	12.37	1950	14.39
1948	17.28	1951	18.30

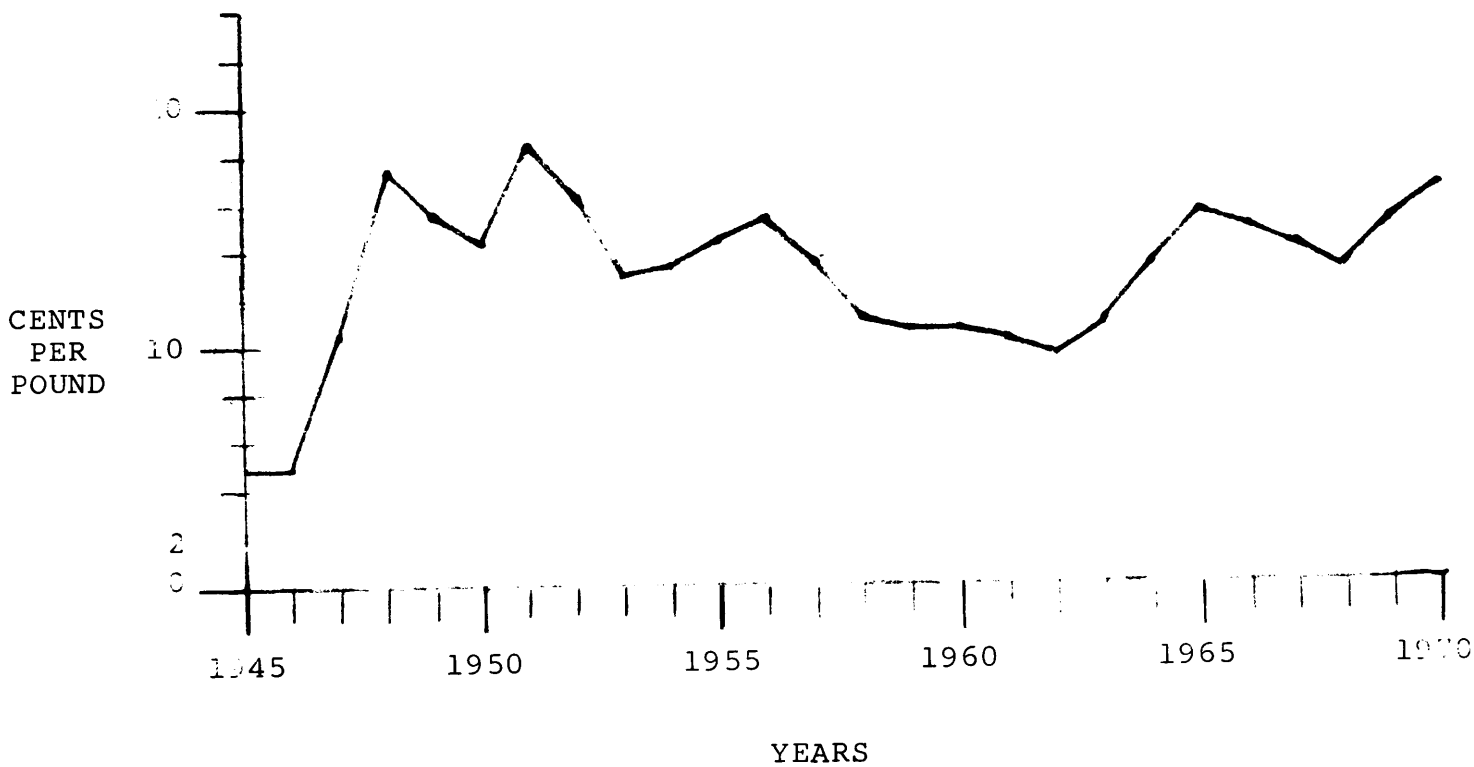
Year	Price Per Pound ¢	Year	Price Per Pound ¢
1952	16.13	1962	9.92
1953	12.90	1963	11.04
1954	13.35	1964	13.42
1955	14.39	1965	15.50
1956	15.51	1966	14.94
1957	13.94	1967	14.00
1958	11.34	1968	13.43
1959	10.61	1969	15.20
1960	10.68	1970	16.50 (at June 30)
1961	10.21		

Source: Canadian Mines Handbook, Northern Miner Press Ltd., Toronto, Ontario.

Figure 12

Average Annual Canadian Price of Lead Per Pound

(Current dollars)



The United States placed quotas on imports of unmanufactured lead effective October 1, 1958. Imports from Canada were restricted to an annual quota equal in amount to eighty percent of the average annual amount exported from Canada to the U.S. during the years 1953 to 1957. The quota on lead ores was set at 132,320 tons, and the quota on lead metal was set at 224,400 tons to be delivered in quarters. Since 1962, the consumption of lead has exceeded production in the Free World and this shortage resulted in an upward movement of prices. The average Canadian price of silver was 9.92 cents per pound in 1962 and increased to 11.04 cents in 1963, 13.42 cents in 1964 and 15.50 cents in 1965.

The United States authorized the release of 200,000 tons of lead from stockpiles in April, 1965, 50,000 tons of this was reserved for the government's use. Sales were restricted to domestic buyers. Of the 150,000 tons authorized for sale, 60,000 tons were offered for sale and 20,000 tons were sold. The remaining 40,000 tons were offered for sale on a once-a-month basis. By the end of 1965, 16,900 tons were sold and monthly sales of the remaining 23,100 tons continued in 1966. By proclamation on October 22, 1965, the President of the United States abolished the quotas for lead ores effective immediately and the quotas for lead metal. The average Canadian price of lead dropped to 14.00 cents per pound in 1967 from 14.94 cents in 1966 and continued to fall to an average of 13.43 cents in 1968. The United States authorized the release of 100,000 tons of lead for domestic from its stockpiles in July, 1969. By the end of the year 25,000 tons were sold. The U.S. Office of Emergency Preparedness on December 4, 1969, announced that it had an objective of 530,000 tons maintained in stockpiles for conventional war requirements. There was a nationwide strike of the American nonferrous smelter and refinery industry. The average annual Canadian price of lead rose to 15.20 cents per pound in 1969 and at June 30, 1970, it was 16.50 cents.

2. Lead Production, Consumption and Trade

In 1969, 317,537 short tons of lead were produced in Canada valued at about $96.2 million. This was about seven percent less in tonnage than 1968, however, since metal prices were higher in 1969 there was an increase of $4.7 million. Increased production in the Yukon Territory, New Brunswick and Newfoundland was more than offset by decreases in British Columbia and the Northwest Territories. Figure

13 presents the production of lead by province for 1969.

Figure 13

Canadian Lead Production By Province, 1969

Province	Short Tons	Value -$-
British Columbia	102,548	31,051,550
Northwest Territories	102,500	31,037,000
New Brunswick	56,140	16,999,343
Newfoundland	21,094	6,387,318
Yukon Territory	15,400	4,663,120
Ontario	12,745	3,859,322
Nova Scotia	2,607	789,407
Saskatchewan	2,505	758,510
Quebec	1,405	425,222
Manitoba	593	179,389
TOTAL	317,537	96,150,181

Source: J.G. George, Lead 1969, Department of Energy, Mines and Resources, Mineral Resources Branch, Report No. 26.

The data for 1969 is the preliminary data for the year released by the Federal Government.

The production of primary refined lead in Canada for 1969 was 187,143 short tons. Cominco Ltd. operates a lead smelter and refinery at Trail, British Columbia, which has an annual capacity of 190,000 tons, and the East Coast Smelting and Chemical Co. Ltd. operates a refinery at Belledune, New Brunswick, which has an annual capacity of 33,000 tons. The Trail plant treated most of the lead ores and concentrates from western Canada and the rest was treated at plants in the northwest American states, Japan and Europe. Eastern Canadian lead ores and concentrates were treated at the Belledune plant and in Europe and the United States.

Consumption of lead has continued to climb to 107,270 short tons in 1969 from 72,087 short tons in 1960 and this is shown in Figure 14.

Figure 14

Consumption of Lead in Canada

Years	Consumption (Short Tons)	Year	Consumption (Short Tons)
1960	72,087	1965	90,168
1961	73,418	1966	96,683
1962	77,286	1967	93,953
1963	77,958	1968	94,660
1964	82,736	1969	107,270

Source: Ibid.

Exports from Canada of lead ores and concentrates in 1969 was 140,175 short tons and lead metal exports were 117,094 short tons. Figure 15 lists Canada's exports of lead by importing country.

Figure 15

Canadian Lead Exports By Importing Country, 1969

Importing Country	Short Tons		
	In Ores and Concentrates	In Metals	Total
United States	62,211	54,345	116,556
Japan	37,808	1,542	39,350
West Germany	18,070	7,155	25,225
United Kingdom	7,860	42,819	50,679
Belgium and Luxembourg	12,194	524	12,178
India	n.a.	3,733	3,733
Netherlands	n.a.	3,170	3,170
Norway	n.a.	1,635	1,635
Other Countries	2,032	2,711	4,743
TOTAL	140,175	117,094	257,269

Source: Ibid.

Because Canada is the second largest producer of lead, after Australia, the only imports in 1969 made by Canada were 3,800 short tons as refined metal.

In Canada the use of lead antiknock compounds in gasoline makes up about twenty-five percent of consumption. It appears reasonable to assume that governments will phase lead

out of gasolines slowly so that growth in other uses of lead will offset any decreases experienced. Increased lead production from mines in the New Missouri Lead Belt area will mean that for a few years there will be a decrease in demand for imported lead in the United States. However, lead exports from Canada in the future will readily find markets and one of the major importing countries will be Japan.

C. THE ZINC MARKET

1. The Price of Zinc

Sales of zinc in Canada are made at prices quoted in cents per pound of Prime Western grade zinc delivered at Toronto and Montreal. Sales of zinc abroad are based on the price per pound for Prime Western zinc at East St.Louis, Illinois, and since 1964, the overseas producer basis price. These have a minimum zinc content of 98 percent and premiums are quoted for the higher grades. In Canada these premiums are 0.6 cents a pound for High Grade and 1.0 cents a pound for Special High Grade. The difference in the price of zinc between these markets is primarily the exchange rate and the cost of transportation. Figure 16 and 17 present the average annual Canadian price for zinc for the years 1946 to 1970 in current dollars.

Figure 16

Average Annual Canadian Price of Prime Western Zinc

(Current Dollars)

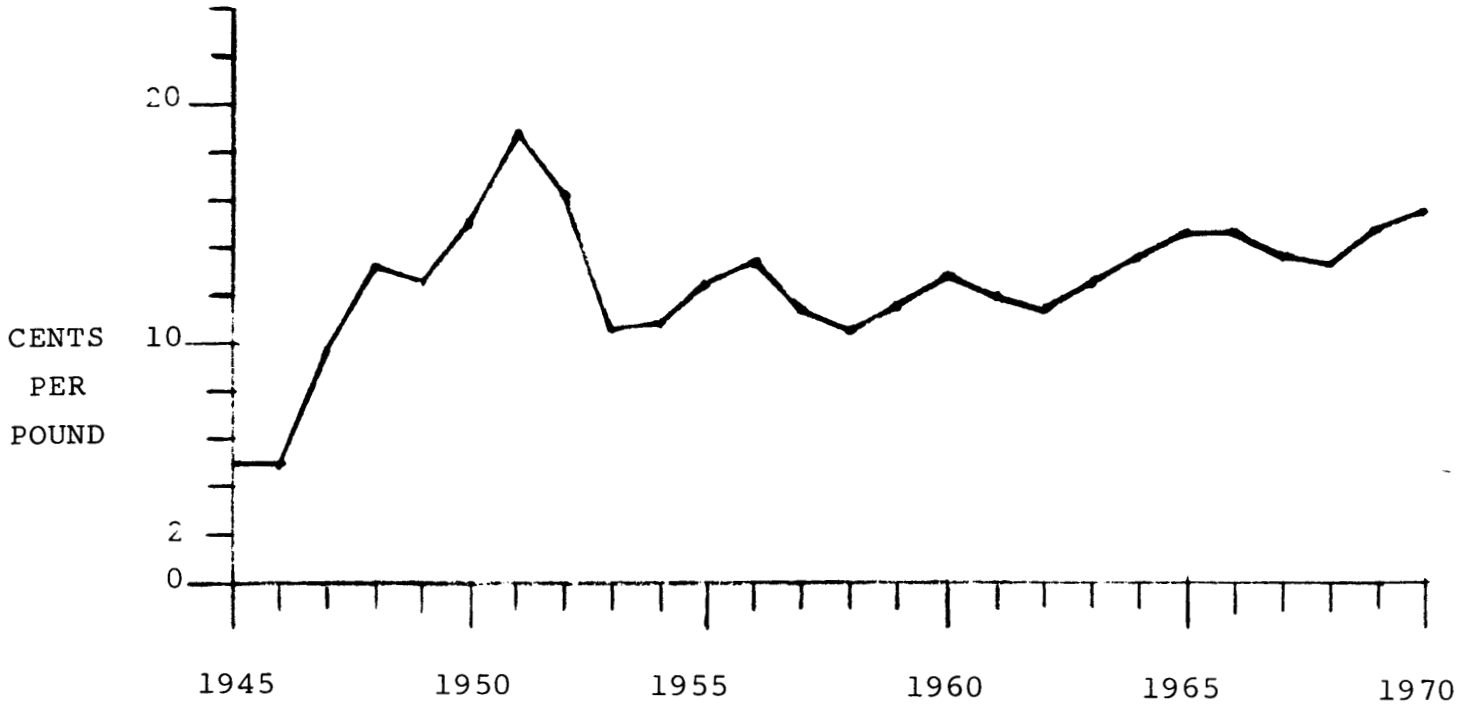
Year	Price Per Pound ¢	Year	Price Per Pound ¢
1946	5.15	1959	11.65
1947	9.94	1960	12.75
1948	13.12	1961	11.98
1949	12.48	1962	11.50
1950	14.95	1963	12.21
1951	18.83	1964	13.57
1952	16.02	1965	14.50
1953	10.59	1966	14.50
1954	10.70	1967	13.87
1955	12.30	1968	13.50
1956	13.49	1969	14.67
1957	11.40	1970	15.50 (at June 30)
1958	10.30		

Source: Canadian Mines Handbook, Northern Miner Press Ltd., Toronto, Ontario.

Figure 17

Average Annual Canadian Price of Zinc

(Current dollars)



Quotas on imports of unmanufactured zinc were introduced by the United States on October 1, 1958. Imports from Canada were restricted to an annual quota equal in amount to eighty percent of the average annual amount exported from Canada to the U.S. During the years 1953 to 1957. The quota on zinc ores was set at 379,840 tons and the quota on zinc metal was set at 141,120 tons to be delivered in quarters. In the last half of 1964 the United States sold 75,000 tons of zinc from its stockpiles. These sales continued into 1965 and in April a further 150,000 tons was authorized for sale and an additional 50,000 tons for government use. The 150,000 tons was sold by August and in November 200,000 more tons had been authorized for sale of which 75,000 would be sold in 1965 and the rest in 1966.

The average annual Canadian price of zinc (Prime Western Grade) from 1959 to 1969 in terms of constant 1959 dollars has not fluctuated significantly and in fact the U.S. price

in 1969 was only 0.2 cents per pound greater than the price in 1959, (in terms of 1959 dollars). In 1968 the average annual Canadian price of zinc, Prime Western Grade, was 13.50 cents per pound, and this increased to 14.67 cents in 1969. The price at June 30, 1970, was 15.50 cents per pound. New deposits of zinc are not being discovered and developed quickly enough since estimates of the supply of zinc over the period 1971 to 1974 indicate that it will be far short of the amount necessary for optimum smelter operation. From 1959 to 1969, the price of zinc was only high enough to bring those deposits easily mined into production but it was not high enough to warrant exploration and development activities at a rate high enough to replenish those reserves already consigned to production. It would appear that zinc prices will increase in the near future.

2. Zinc Production, Consumption and Trade

The production of zinc ores and concentrates from Canadian mines was 1.3 million short tons in 1969 and Canada continued to be the largest producer of zinc in the Free World. Production of new refined zinc from domestic primary materials plus estimated recoverable zinc in ores and concentrates exported by province for 1969 is presented in Figure 18.

Figure 18

Canadian Zinc Production By Province, 1969

Province	Short Tons	Value -$-
Ontario	349,408	106,429,692
Northwest Territories	220,000	67,012,000
Quebec	195,923	59,678,030
New Brunswick	158,201	48,188,025
British Columbia	148,128	45,119,758
Manitoba	48,909	14,897,699
Newfoundland	33,906	10,327,540
Saskatchewan	28,218	8,595,317
Yukon Territory	17,075	5,201,045
Nova Scotia	121	37,020
TOTAL	1,199,889	265,486,126

Source: Robert J. Shank, Zinc 1969, Department of Energy, Mines and Resources, Mineral Resources Branch, Report No. 56.

The data for 1969 is the preliminary data for the year released by the Federal Government.

The Canadian production of primary refined zinc in 1969 was 466,351 tons of metal. There are four domestic primary zinc plants in Canada and they are:

1. Canadian Electrolytic Zinc Ltd., Valleyfield, Quebec.
2. Cominco Ltd., Trail, British Columbia.
3. East Coast Smelting and Chemical Co.Ltd., Belledune, New Brunswick.
4. Hudson Bay Mining and Smelting Co. Ltd., Flin Flon, Manitoba.

Consumption of zinc in Canada rose to 118,681 short tons in 1969 from 55,803 short tons in 1960 as shown in Figure 19. Imports for the year were 8,657 short tons.

Figure 19

Consumption of Zinc in Canada

Years	Consumption (Short Tons)	Years	Consumption (Short Tons)
1960	55,803	1965	93,796
1961	60,878	1966	107,052
1962	65,320	1967	107,779
1963	73,653	1968	115,978
1964	88,494	1969	118,681

Source: Ibid.

Exports from Canada of zinc ores and concentrates was 804,664 short tons and 321,986 short tons in metals in 1969. Figure 20 presents Canada's exports of zinc by importing country for 1969.

Figure 20

Canadian Zinc Exports By Importing Country, 1969

Importing Country	Short Tons In Ores and Concentrates	In Metals	Total
United States	383,177	158,392	541,569
Belgium and Luxembourg	156,397	4,795	161,192
West Germany	110,954	13,107	124,061
Japan	66,873	n.a.	66,873
France	45,308	n.a.	45,308
United Kingdom	21,374	84,348	105,722
Other Countries	-	-	-
TOTAL	804,664	321,986	1,126,650

n.a.= not available
Source: Ibid.

Only about ninety percent of the zinc is recovered from concentrates by smelters. Within the next few years a large number of new smelters will be put into operation in the Free World, especially in Japan and Europe, areas that are deficient in zinc ores and concentrates. This will result in an increased demand for Canadian zinc ores and concentrates.

SECTION V

RECO SILVER MINES LIMITED (N.P.L.)

A. THE PROPERTIES

The property owned, optioned or leased by Reco Silver Mines Ltd. (N.P.L.) are all located in the Slocan Mining Division. They are shown in Figure 21.

1. The Reco Group:

This group consists of:

a. The following 26 Crown Granted Claims:

Lot Number		Lot Number	
517	Clifton	1854	Twilight
589	Texas	2260	Polo
600	Ephraim Fraction	2432	Kaslo
612	New Denver	2433	Alma No.2
618	Omega	2434	Oro
624	Ruecau	2901	Eldorado
808	Mollie	3998	Grandview
1304	Pirate	4002	Shoshone
1752	Chambers	4560	Number One
1753	Eureka	4561	Number Two
1754	Jay Gould	5916	Number Three
1755	Wellington	5917	Number Four
1851	Gopher	5918	Number Five Fraction

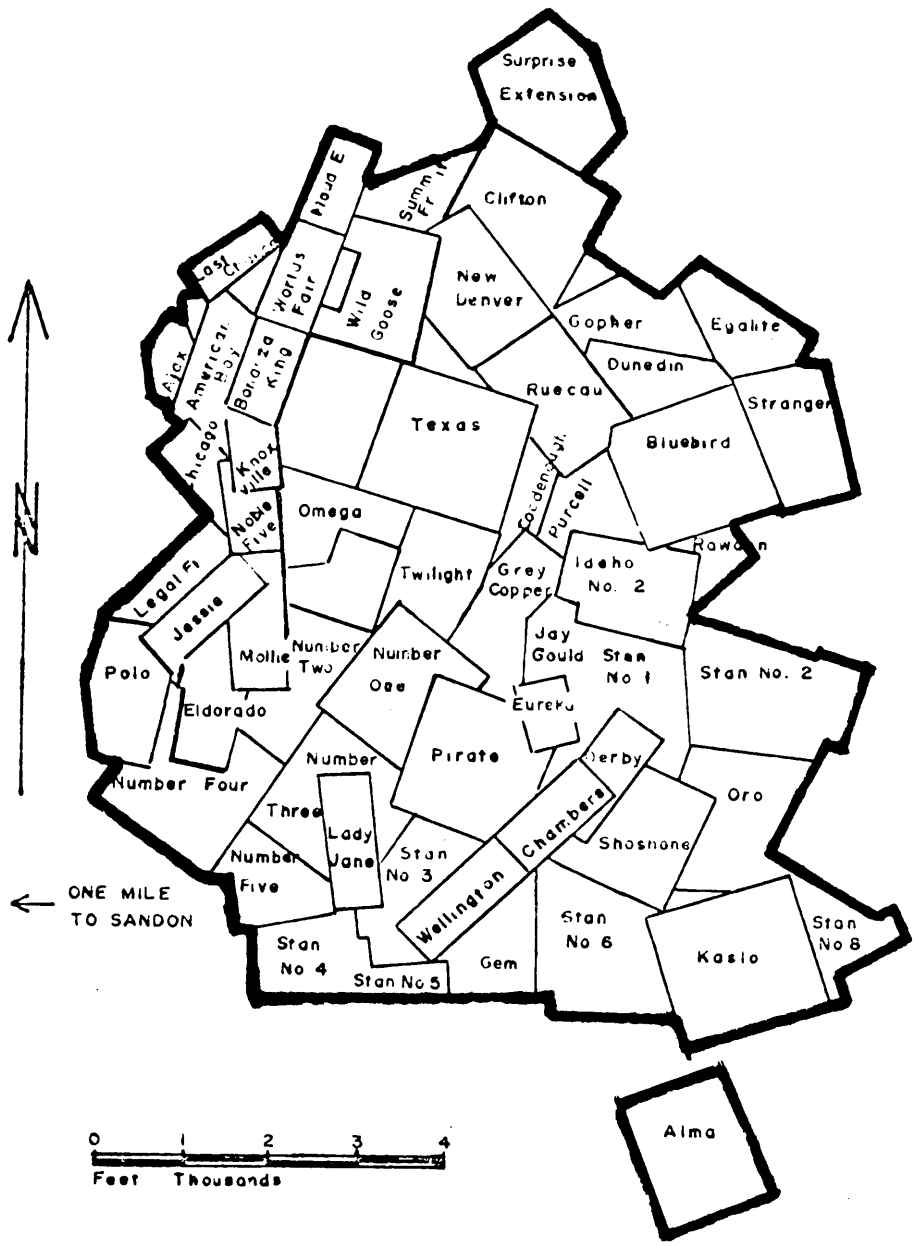
b. and the 12 Located Claims:

Lot Number		Lot Number	
5674	Shady Fraction	7432	Stan No.5
5675	Gem	7472	Wedge Fraction
7058	Stan No.1	7473	Eva Fraction
7059	Stan No.2	11261	Stan No.6
7060	Stan No.3	11262	Stan No.7
7431	Stan No.4	11263	Stan No.8

Except for the Alma No.2 claim, lot number 2433, which is a short distance from the Kaslo claim, lot number 2432, all of the other claims are contiguous.

Figure 21

Property Plan of Reco Silver Mines Ltd.(N.P.L.)



2. The Vespar Group:

This group consists of the following 21 Crown Granted Claims:

Lot Number		Lot Number	
463	Maud E	717	Last Chance
464	Worlds Fair	1305	Lady Jane
465	Bonanza King	1727	Ajax
466	Knoxville	1849	Blizzard
467	Noble Five	1855	Derby
571	American Boy	4534	Legal Fraction
587	Treasure Vault	4546	Black Hawk Fraction
599	Lucetta	4547	Frank Fraction
614	Wild Goose	5599	Summit Fraction
620	Jessie	5600	Surprise Extension
622	Chicago		

These claims are contiguous and adjoin the Reco group on its western side.

3. The Bluebird Group:

This group, which adjoin the Reco group to the west, consist of the following 9 Crown Grant Claims:

Lot Number		Lot Number	
512	Stranger	855	Rawdon
540	Bluebird	1013	Idaho No. 2
580	Grey Copper	1853	Dunedin
581	Goodenough	3103	Egalite
849	Purcell		

Reco Silver Mines Ltd.(N.P.L.)owns or has under lease the majority of claims on the south side of Reco Mountain. Included in Reco Silver's property are a number of mines that have been good proven producers in a period when manual mining methods were used.

B. DEVELOPMENT WORK COMPLETED TO DATE

Since 1964, development work on Reco Silver Mines' property has been carried out on a near-continuing basis. The Cody-Reco and the Bluebird claim groups have been

consolidated with the holdings of Reco Silver Mines Ltd.(N.P.L.). More than one mile of new roads were built and a further mile was improved, principally to the Chambers 4785 tunnel and to portions at new veins. Surface exploration included diamond drilling, soil sampling, tunnel prospecting, hand trenching, bulldozer stripping and underground drifting. A full topographical survey and surface and underground surveying of the property has been completed. Many of the accessible mine workings have been geologically mapped. Three thousand feet of baseline have been cut and over fifteen thousand feet of crosslines and several miles of transit surveys have been completed on mining grids. Several hundred soil samples have been taken in geochemical surveying on established grids.

Eight adits of mines have been reopened:

Number One Claim: No. 2,3,4 and 16 mines;
Number Two Claim: No. 11 and 15 mines;
Reco-Goodenough Claim: No. 8 mine; and,
Chambers Claim: 4785 mine.

This work was completed for examination and sampling preparatory for underground exploration. Mineralization was located in the old workings. A fault of major proportions has been located and new mineralization discovered. A considerable amount of surface stripping by bulldozer has been undertaken, particularly in the region northwest of the Number Two Claim. A vein structure was disclosed in this area which was believed to be an extension of the Deadman Vein. The portal of the Chambers 4785 tunnel was re-opened and timbered. Drifting was completed for 254 feet at the present face. Construction at this site included a change house and a powder house

C. ACCESS AND SERVICES

1. Location and Access

All of the mineral claims of the Reco, Vespar and Bluebird Groups held by Reco Silver Mines Ltd. (N.P.L.) are located within twelve miles of the village of New Denver on Slocan Lake. New Denver is about 450 highway miles east of Vancouver and can be reached by automobile in about eight hours. The road east to Sandon and Cody is primarily graded with the first two miles gravelled. Access to Reco Silver's property from Cody is provided by a good switchback road best used by four-wheel drive vehicles. Sandon is located at latitude 48° 58' north and longitude 117°

13' west and at an altitude of 3,550 feet from sea level.

Pacific Western Airlines Ltd., provides daily flights to Castlegar for a one way fare of thirty-five dollars and are scheduled out of Vancouver in the mornings. Return flights out of Castlegar are also in the mornings so that an overnight stay is required. From the Castlegar Airport an automobile can be rented and driven the sixty miles to New Denver in about two hours. Alternatively, a float plane could be chartered during the summer season and flown direct from Vancouver to New Denver and return the same day. Harrison Airways Ltd. has quoted a total cost of $405 for a five passenger aircraft for the round trip and estimates that the flight would take two hours each way which would allow a full day to be spent at Reco Silver's property. There is a light aircraft field maintained at Kaslo, about forty road miles distant from Sandon.

Freight service for carload lots is available from the Canadian Pacific Railway's rail-barge service from Slocan City to New Denver. More convenient service is provided by interline truck service from both Vancouver and Calgary via Nelson. A sample of truck rates from Vancouver to New Denver are presented in Figure 22.

Figure 22

Truck Freight Rates From
Vancouver to New Denver

Item	Rate Per Hundred Pounds
Class 85 (machinery parts)	$3.54
Machinery	$4.17

Source: Traffic Department, Millar & Brown Ltd.

2. The Service Centre of New Denver

New Denver is a small village of about 800 persons located on the eastern shore of Slocan Lake about twelve miles west of Reco Silver's property. Figure 23 presents the population of New Denver for the years 1941 to 1966. The village has a number of stores, a postoffice, a hospital and two sawmills. There are limited hotel-motel facilities, the largest being the Newmarket Hotel which has a dining room and was opened in 1893.

Figure 23

Population of New Denver, B.C.

Year	Population
1941	310
1951	771
1956	736
1961	564
1966	623

Source: Census of Canada

3. Climate, Topography, Water and Timber

Temperatures range from ten degrees below zero (-10°F.) in winter to seventy-five degrees above (75°F.) in summer. Snow first falls in October and disappears in May. Figure 24 presents the average amount of precipitation experienced by month at Sandon.

The base elevation at Sandon is 3,550 feet above sea level, while Cody is at 4,000 feet and both are contained in the narrow valley of Carpenter Creek. Reco Mountain has an elevation of 8,260 feet and Reco Silver Mines' claims are located from about 4,000 feet to about 8,000 feet in elevation. The topography is of the Alpine type. At the lower levels there is much tree cover but there is little at the top.

A number of small creeks on Reco Mountain are tributaries of Carpenter Creek which flows westerly into Slocan Lake. The Carnegie Mining Corp., a subsidiary of Kam-Kotia Mines Ltd., operates a 200 K.W. hydro-electric power plant for milling from the Silmonac Mine on Carpenter Creek at Sandon.

Good timber, principally cedar, hemlock and some fir, grows to about the 5,500 foot elevation. The local sawmills are supplied with timber from this area. Sawmills are located nearby at New Denver, Kaslo and Slocan City.

Figure 24

AVERAGE ANNUAL PRECIPITATION, SANDON, B.C.

-inches-

	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec	Annual Total
Mean Rainfall	0.20	0.24	0.62	1.86	2.82	3.50	1.99	2.87	3.01	3.54	1.31	0.32	22.28
Mean Snowfall	41.8	32.8	24.4	7.4	0.7	-	-	-	-	5.5	26.1	42.7	181.4
Mean Total Precipitation	4.38	3.52	3.06	2.60	2.89	3.50	1.99	2.87	3.01	4.09	3.92	4.59	40.42
No.of Days With Measurable Rain	-	1	2	6	9	11	7	8	8	10	4	1	67
No.of Days With Measurable Snow	15	13	10	3	-	-	-	-	-	2	10	16	69
No.of Days With Measurable Precipitation	15	13	11	9	9	11	7	8	8	11	13	17	132
Maximum Precipitation in 24 Hours	1.15	1.20	1.14	1.15	1.59	1.75	1.10	1.65	1.85	2.05	1.30	1.82	2.05

Source: Meteorological Branch, Department of Transport.

D. DEVELOPMENT RESULTS

The results of exploration work by Reco Silver Mines Ltd. (N.P.L.) is presented in the following paragraphs.

1. The Chambers Vein (Reco Group)

The Chambers Vein is located at an elevation of about 4,600 to 4,900 feet and is in a strong wide structure. It has a east-north-east strike and a southward dip of fifty to eighty degrees. This vein is four feet wide at the face of the current working level and has been traced more than 1,100 feet up the steep mountain slope. Four adits were driven by previous operators and a large amount of shallow exploration was carried out. Examination of portions of these adits shows that the vein progressively strengthens to the northeast as rocks change from argillaceous sediments to mixed argillites and quartzites and then enters a wide sill of quartz porphyry.

Exploration work by Reco Silver Mines Ltd. (N.P.L.) has included trenching and sampling of a highgrade outcrop in the porphyry surface. Channel sampling results to date indicates an average surface width of 1.76 feet and the gross value of the contained metals averaged $127.00 per ton.

An adit at an elevation of 4,785 feet was the most northeasterly old working. Previous operators had driven a 175 foot tunnel, made up of forty-five feet of crosscut intersecting the vein and a drift along the vein for 130 feet, using picks, shovels and wheelbarrows. The face of this tunnel was about seventy feet from being under the first part of the outcropping. Reco Silver Mines Ltd.(N.P.L.) has enlarged the tunnel so that modern equipment can be used and the face has been advanced 142 feet in a northeasterly direction. A further fifty or sixty feet should bring the tunnel into a porphyry sill which is hundreds of feet wide.

Mineralization ahead of the drift was disclosed by diamond drilling and indicated a vein width of more than twenty feet. The geological conditions are such that the Chambers Vein has an excellent chance of being developed into a major lode.

2. The Kaslo Claim 2432

Two veins were discovered on the Kaslo Claim about 250 feet distant from each other. The two structures had

moderate strength. About seventy years ago drifting had been carried out on the older vein, the Discovery No. 1 Vein. It was found to be about one foot wide and had a strike of about due north. At about fifty feet to the south the vein weakened. The Discovery No. 2 Vein is west of the older vein and is 0.9 feet at its maximum width with a strike about due north. Assaying showed 2.3 ounces of silver per ton. The width of this vein narrowed to one inch when it was stripped about fifteen feet to the south. It is estimated that this vein is a subsidiary to a main northeast striking vein.

3. The Number One Mine (Reco Group)

About sixty years ago the old workings No.'s 1,2,3 and 4 in descending order were driven by hand to develop the Main Lode. Most of the early production came from the No. 3 Level upwards and totalled 472 tons which averaged sixty-six ounces of silver and fifty-two percent lead per ton. Payments were not made for zinc. It has been estimated that this ore was handsorted from 2,250 tons of broken ore which contained fifteen ounces of silver and fifteen percent of lead per ton.

Reco Silver Mines Ltd.(N.P.L.)has carried out some examination of mineralization and some repair work at adit portals on the Number One Mine. The downward continuation of the ore mined above the No. 3 Level is the most apparent exploration opportunity in the Number One Mine. Exploration could be carried out from the No. 4 Level or by extending the No. 16 Level. The No. 16 Level follows a subsidiary vein, the 'A' Vein, which is a quartz vein, in a strong structure. At its present strike, the 'A' Vein will intersect the Main Lode about 160 feet ahead of the present face and about eighty feet below the No. 3 Level. Exploration of these areas would be extensions of known ore bodies.

A long range target has the potential of finding a new ore body between the Number One Mine and the Number Three (or Reco-Goodenough) Mine. Surface geology has shown an increase in the portion of porphyry to supplementary rocks. Exploration in this area would examine the intersection of two strongly mineralized structures. Underground exploration could be carried out from the face of the No. 2 Level which is the most northeasterly of the Number One Mine workings. The present face of the No. 2 Level is in good structure and its last two hundred feet has mineralization that approaches commercial values.

4. The Number Two Mine (Reco Group)

The original discovery on the old Reco property was made on the Number Two Mine. Previous underground workings totalled about 3,500 feet. The Number Two Lode cuts across the northwestern end of the Ruecau Claim and was worked over a vertical range of 350 feet from three adits. This five foot wide outcrop has been traced several hundred feet up the hill and at one location was found to be scattered over a forty foot width. Initially this mine produced 3,928 tons of ore using picks, shovels and wheelbarrows. It is felt that the discovery of a new ore body at further depth is a distinct possibility at the east end of the No. 5 tunnel.

5. The Number Three Mine (Reco Group)

Known also as the Reco-Goodenough, this mine is about 750 feet southeast and parallel to the No. 2 Vein. Early production was 3,866 tons and this mine is noted as having produced the richest silver-bearing lead ore in quantity in the Slocan. Underground workings over a vertical range of 529 feet was made up of about 5,000 feet of drifts and crosscuts. Recent work by Reco Silver Mines found that the west ore-shoot was cut off against a flat fault about sixty feet above the No. 8 adit, the lowest adit. Examination of the dip of the vein from the No.7 Intermediate indicated that if the No. 8 Level had been extended to pick up the vein it would have entered the Purcell Claim. High silver to lead ratios are found at depth in this mine.

6. The Noble Five Mine (Reco Group)

The Noble Five Mine was opened by eleven portals and lateral work was carried out on fifteen levels. The old mine is from the No. 8 Level up to the surface. Drifting and crosscutting work totalled about 17,000 feet and there was a further 2,000 feet of raising. A gravel road at the 5,000 foot elevation leads from the No. 18 Crosscut to Cody. Mining by picks and shovels in the early days carried out on the upper levels produced 1,500 tons of ore. This was followed by the construction of a 2,700 foot crosscut and a 1,000 foot shaft raise which connected the No. 18 Level to the No. 8 Level. The death of the Hon. James Dunsmuir interrupted further activity on the property.

The ore body on the No. 8 Level was developed by another company after 1928 and a major ore body was

disclosed by drifting east on the 1,800 Level. The width of ore disclosed in the No. 18 ore body averaged 7.4 feet for one ore block of 12,000 tons. During 1929 and 1930, 21,100 tons were mined and milled from the two ore bodies and graded 13.35 ounces of silver, 6.55 percent of lead and 7.75 percent zinc per ton. The mine closed in 1930 after the drastic fall in metal prices during the Depression.

7. The Purcell Claim (Bluebird Group)

Silver-lead float was discovered by the construction of a road across the Purcell Claim in the 1920's. This location was about eight hundred feet to the southeast of the high-grade Reco-Goodenough (now called the Reco Number Three Mine) and about nine hundred feet northeast from ore showings on the Grey Copper Claim. Hand trenching in conjunction with geo-chemical soil sampling provided Reco Silver Mines Ltd. (N.P.L.) with positive results. The favourable area appears to be from 270 to 430 feet to the northeast of the tunnel portal and about 250 to 300 feet below the surface. A composite sample of surface float assayed 433.2 ounces of silver and 68.58 percent of lead per ton.

8. Other Veins

There are many other known veins in Reco Silver's property. Some of them have been former producers and others have known mineralization yet to be developed. The more prominent are some of the following and they include the Ruby Silver No. 1 and Ruby Silver No. 2 on the Maud E claim. There is the Galena Vein to the northwest of the Last Chance (Surprise) vein; the Deadman vein strikes into the Reco ground on the northeast as well as the southwest extension. The Bluebird vein is on strike into the pirate claim. There is considerable ground on strike of these various veins yet to be worked as well as almost 2,000 feet of backs on each of the vein systems. The opportunity is therefore extensive for continued vein development.

E. EXPLORATION AND DEVELOPMENT COSTS

The cost factors through to production are constantly changing in the development of a mine. It is for that reason in this analysis it would be premature to itemize individually the exploration and development costs of the many Reco Silver veins and their potential ore bodies. Consequently these estimates are best left to progressive and subsequent engineering reports.

F. PROXIMITY TO OTHER MILLS AND LEAD-ZINC SMELTERS

There are a number of mills located near Reco Silver

Mines' property. The Carnegie Mining Corp.'s mill at Sandon is used to concentrate ore from Kam-Kotia Mines Ltd.'s Silmonac property. At Silverton, about fifteen miles from the Reco Silver property, there are two mills, one owned by Western Exploration Co. Ltd. and the other by the Red Deer Valley Coal Co. Ltd. Both of these mills have excess capacity available.

Reco Silver Mines Ltd. (N.P.L.) is most fortunate in that its property is located only eighty-five miles north of Cominco Ltd.'s lead smelter and zinc refinery at Trail. Except for the last ten miles to Sandon they are all good paved roads. The Bunker Hill Company also operates a smelter at Kellogg, Idaho, three hundred miles south of Sandon. The location of these mills and smelters in relation to Sandon are shown in Figure 25.

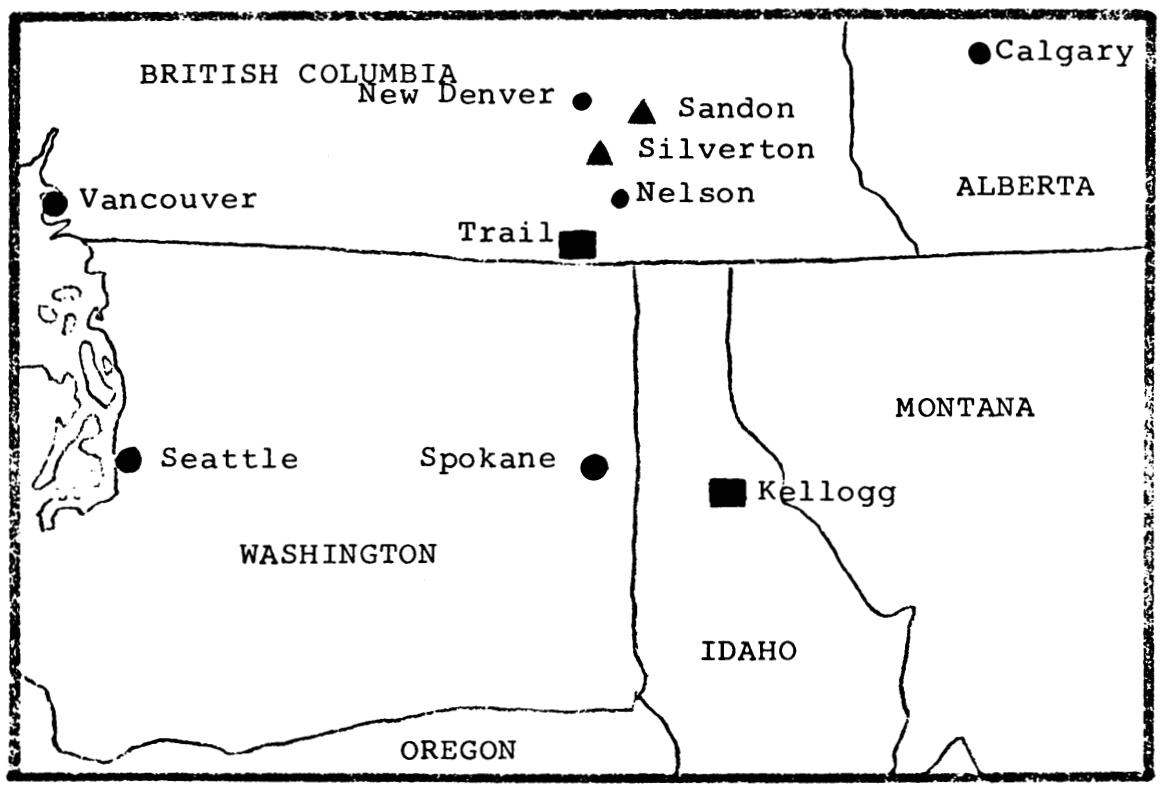
Figure 25

Mills and Lead-Zinc Smelters

in Relation to Reco Silver Mines'

Property at Sandon, B.C.

LEGEND: Cities ● Mills ▲ Smelters ■



SECTION VI

AN ANALYSIS OF SOME BETTER KNOWN PRODUCING SILVER MINES

A. GALENA HILL, MAYO DISTRICT, YUKON TERRITORY

The Treadwell Yukon Corp. in 1936 began production from the Calumet, Elsa and Silver King mines on Galena Hill after exhausting the ore in its Keno Hill mines. Operations were suspended during World War Two and in 1947 the United Keno Hill Mines Ltd. was formed. The assets of the older company were acquired along with other properties and an extensive development programme undertaken which discovered many mineable ore bodies. United Keno Hill Mines Ltd. is the largest silver producing company in the Yukon Territory. In 1969, the company produced approximately 2.4 million troy ounces of silver from lead-zinc ore from the Calumet and Elsa mines, which graded 27.98 troy ounces of silver to the ton.

The silver-bearing ore is obtained from veins which normally follow faults with a northeasterly trend and that dip steeply to the southeast. The veins are offset by northwest cross faults at many locations, such as the Calumet and Hector faults which have displaced the vein system by 320 and 280 feet respectively. Access to these mines is by a 1,600 foot adit at a nominal elevation of four hundred feet measured downward from the Hector outcrop. The length and height of ore shoots vary in size from fifty to hundreds of feet and from five to fifty feet in width. The ore bodies' shape and size vary greatly as some are generally regular and others are highly irregular. Close timber support is required in tunnelling because the wall rock is of an incompetent nature. Some of the other problems encountered are buildup of ice in natural ventillation and permafrost, which in some locations extends to a depth of 450 feet.

B. COEUR D'ALENE MINING DISTRICT, IDAHO

Mining in the Coeur d'Alene district became significant after 1920 although some activity had been carried out in the area since 1877. Silver production increased from 36,978 troy ounces in 1920 to 2.7 million troy ounces in 1930. Despite this impressive growth in production most mining men had avoided the area until the discovery of the extremely rich ore body in the Sunshine Mine in 1930 because it was felt that the veins were superficial and did not "go down." By 1931, the Sunshine became the largest silver

producer in Idaho and in 1937 the largest in the world. Silver production from the area in 1937 was about 14 million troy ounces. Almost all of Idaho's 1969 silver production of 18.9 million troy ounces came from the Coeur d'Alene district. It remains the United States' most important silver producing region and over the past eighty-five years has produced over 750 million ounces of silver.

The veins of the Silver Belt in the Coeur d'Alene district in general strike approximately east and west, and dip steeply south from forty-five to eighty-five degrees. Most of the veins range in width from a fraction of an inch up to ten feet. Primary silver veins are worked at great depth. The ore shoot of the Sunshine mine became exceptionally productive over two thousand feet below the surface at the 1,700 foot level in 1935. Workings are now carried out more than a mile below the surface.

C. SLOCAN MINING DIVISION, BRITISH COLUMBIA

The Slocan Mining Division during the years 1892 through 1969 produced 75,806,059 troy ounces of silver; 1,076,582,963 pounds of lead; and, 905,787,641 pounds of zinc. Using current prices of $1.75 per troy ounce for silver, 16½¢ per pound for lead and 15½¢ per pound for zinc the total value of production from the Slocan would amount to a gross value of $450,693,876. Silver production from 1892 to 1919 averaged about two million troy ounces annually and dropped to about one million troy ounces annually until the Great Depression of 1929. During the depression and World War Two silver production from the Slocan was nominal. After the war rising silver prices sparked mining activity and by 1953 annual silver production had exceeded one million troy ounces. Annual silver production remained at this level until 1958 when it dropped to about 500,000 troy ounces and it has stayed at this level since.

A few descriptive remarks on the more important silver producers in the Slocan follows, which, except for the Standard, all experienced their most profitable development after World War Two.

1. The Bluebell Mine, Riondel, British Columbia

A botanist in 1825 made the earliest reported discovery of sulphide ore at the present site of the Bluebell Mine. In later years trappers of the Hudson Bay Company made bullets from galena found at this site. R.E. Sproule rediscovered the outcrops and staked them in 1882. Postwar

exploratory activity was resumed in 1947 by Cominco. Production commenced in 1952 and in 1969, about 230,000 tons of ore was mined which produced 304,927 troy ounces of silver, and 10,000 tons of lead and 12,000 tons of zinc.

The rocks are members of the Lardeau series and consist of schist, quartzite and limestone. Thin sheets of pegmatitic granite follow some bedding planes and lamprophyre dykes are common. The ore deposits are sulphide replacements in a limestone band about one hundred feet thick, striking north and dipping thirty-five to thirty-eight degrees to the west under Kootenay Lake. There are three separate ore zones:

- the Bluebell in the centre,
- the Comfort to the north, and
- the Kootenay Chief on the south end.

The production of ore has not kept pace with exploration and during 1969 ore production was cut back to 600 tons per day.

2. Silmonac Group, Sandon, British Columbia

Silmonac Mines Ltd. was formed in 1963 and controls a total of sixty-three claims, the two principal claims being the Silmonac and the Minniehaha. Kam-Kotia Mines Ltd., the present name of Violamac Mines Ltd., owns 22.49 percent of Silmonac Mines Ltd. Development proceeded intermittently and in 1967 an ore body of good grade was discovered. The lode is about thirty feet thick and carries veinlets and strands of ore which generally have steeper dips than the main lode.

The work was suspended due to a lack of funds in late 1967. In September, 1968, Kam-Kotia Mines Ltd. entered into an agreement with Silmonac Mines Ltd. and another group which provided for an extensive exploration and development programme. Work proceeded quickly and the 150 ton capacity Carnegie mill at Sandon was rehabilitated and production commenced in 1970.

3. Standard Group, Silverton, British Columbia

The Standard Mine is located on Four Mile Creek, four miles from Silverton. Development proceeded after 1907 under the direction of Mr. G. Aylard of New Denver and Victoria. Exploration by 1910 held out the promise that this would become one of the major silver producers in British

Columbia. Lead ores and concentrates were sent to the smelter at Trail and zinc concentrates were sent to smelters in the U.S.

This mine was known as the best producer in the Slocan and for many years was the largest shipper from that area. The mine only worked seven months each year during 1914 and 1915 and closed temporarily in 1918. Production resumed in 1919 at the former levels until operations were suspended in 1921. Figure 26 presents a list of dividends paid out by the Standard Mine for the years 1912 to 1916.

Figure 26

Dividends Paid Out By the Standard Mine, 1912 - 1916

Year	Dividends $'000	
1912	425	
1913	650	
1914	475	(operating 7 months)
1915	250	(" " ")
1916	600	
	2,400	

Source: British Columbia, Minister of Mines Report

4. The Victor Group, Sandon, British Columbia

G.A. Petty in 1921 made the first discovery on the Victor group of claims on a hillside almost completely covered with overburden as a result of trenching and ground-sluicing. Violamac Mines (B.C.) Ltd. acquired the property in 1948 and development progressed quickly. A small mill was constructed in 1950 in order to concentrate low-grade ores and to do away with the zinc loss which had been incurred in shipping ores to the smelter. In the postwar period, the Victor was second only to the Bluebell in the production of silver in the Slocan Mining Division.

Figure 27 presents the ore shipments made from the Victor group of claims for the years 1948 to 1960. The dividends paid by Violamac Mines (B.C.) Ltd. during the same period are presented in Figure 28.

Figure 27

Ore Shipments of the Victor Mine, 1948 - 60

Year	Ore Tons	Silver Ounces	Lead Pounds	Zinc Pounds
1948	220	26,592	237,382	56,306
1949	1,717	165,897	1,516,659	552,452
1950	2,418	175,553	2,194,685	887,578
1951	6,089	125,871	1,706,158	805,412
1952	12,182	282,851	3,972,960	2,285,757
1953	27,247	546,648	7,800,306	4,352,167
1954	27,633	541,532	6,990,919	4,673,164
1955	22,253	450,351	6,500,206	3,797,249
1956	22,236	560,778	5,274,047	3,393,616
1957	17,633	339,801	4,673,565	5,217,096
1958	9,037	217,489	2,264,970	1,433,740
1959	6,028	162,746	1,078,086	1,083,134
1960	6,227	99,176	675,045	1,214,182

Source: British Columbia, Minister of Mines Annual Reports

Figure 28

Dividends Paid By Violamac Mines (B.C.) Ltd.

Year	Dividends $'000
1952	100
1953	350
1954	400
	850

Source: British Columbia, Minister of Mines Annual Reports

Production decreased significantly after 1960 and soon after operations on the property passed to a smaller company.

SECTION VII

THE POTENTIAL OF RECO SILVER MINES LIMITED (N.P.L.)

A. METAL PRICES AND TRENDS

The price of silver has climbed significantly since 1961 when the average Canadian price was 94.39 cents per troy ounce. The price remained at$1.398 until 1966 when it rose substantially and reached an average of $2.313 in 1968. Temporary declines were experienced in 1969 and 1970, however, during the first few months of 1971 the price recovered and on April 15, 1971, the U.S. price of silver was $1.734 per troy ounce.

The world demand for silver, caused in large part by the requirements of the United States, exceeded production in 1968 by 134.3 million troy ounces. Despite the declining use of silver in coinage recently the world demand for silver has still exceeded production for a number of years and indications are that this situation will continue. As silver inventories decline the economic law of supply and demand will force the price of silver upwards.

The average Canadian prices of lead and zinc are between fifteen and seventeen cents and these prices will serve as floors during the 1970's below which the prices will not fall. This will be a result of a greatly increased demand for smelter feed by newly installed smelters, principally in Japan and Europe, which will force these prices upwards.

B. CONCLUSION

Reco Silver Mines' property at Sandon is located in the Slocan Mining Division. Silver, lead and zinc production from the Slocan during the period 1892 through 1969 was 75.8 million troy ounces of silver; 1,076.6 million pounds of lead; and 905.8 million pounds of zinc and assuming the average price of silver was $1.75 per troy ounce, lead 16½¢ and zinc 15½¢ it would have a total value of $450.7 million over this period. Reco Silver's property has a known history of production of silver, lead and zinc. Recent exploration and development indicate that the property now has an excellent chance of developing mineable ore on a commercial basis. Mineralization ahead of the drift on the Chambers Vein indicated a width of more than twenty feet. Two

subsidiary veins discovered on the Kaslo Claim indicate the presence of a main structure in the vicinity. Exploration in the Number One Mine holds out the promise of the extension of a known ore body and the discovery of a new large ore body. The opportunity of finding another ore body also exists in the Number Two Mine. High silver to lead ratios are found at depth in the Number Three (Reco-Goodenough) and Noble Five Mines and surface discoveries on the Purcell indicate the presence of a major vein. Existence of these known veins in a favourable geological formation indicates that the opportunity for Reco Silver to develop one or more mines is extremely good.

Ample timber and water is available from sources adjacent to Reco Silver's property and two sawmills are located in New Denver. Reco Silver is presently planning the installation of the mill machinery using the existing mill and foundations and ancillary buildings. A quotation from a leading mill supplier indicates a maximum cost of $225,000 to reinstall a silver-lead-zinc concentrating plant to produce an initial 200 tons per day. This cost includes the complete process from the initial ore crushing to the final concentrating production. Other mills are available in the area should they be required. New Denver with its stores, hospital and other amenities can also be used to provide accommodation for Reco Silver's employees. Cominco's lead-zinc smelter is located at Trail only eighty-five miles south of the property at Sandon and the Bunker Hill Company operates another smelter three hundred miles south at Kellogg, Idaho.

The demand for silver, lead and zinc and their respective prices are increasing and will continue to do so in the forseeable future. In conclusion, Reco Silver Mines Ltd. (N.P.L.) has an excellent potential due to its known geology and the large number of strong veins carrying excellent silver-lead-zinc ratios. Its nearness to a major smelter, the accessibility of the many veins and the availability of good timber and water, should make the Reco Silver property attractive to both producers and investors.

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