

TRUE FISSURE, Lardeau Mining Division

In 1937, the New True Fissure Mining and Milling Co. Ltd., now reported to be in bankruptcy, acquired certain properties in and near Ferguson, B.C., from the True Fissure Mining and Milling Company and Latonia Milling Company. The properties include mineral claims, a mill, camp and accessory buildings lying west of north from the settlement of Ferguson, an hydro-electric power installation on the North Fork of Lardeau River near Ferguson, a transmission line running to the mine, and in Ferguson, buildings used as an assay office, and as a combined office and residence for the staff.

The claims include ground on which fairly extensive workings had explored several veins from which some crude silver-lead ore had been shipped at intervals from 1895 to 1918. The mill, power plant and transmission line were completed in 1930 but the property was not brought into production at that time. In 1937 it was necessary to make extensive repairs to the flume leading water to the power plant, rebuild the foundations of the power plant, and make extensive repairs to the foundations and machine settings in the mill. The company also made improvements to the road between Ferguson and the mine. Milling was commenced in October 1937, and stopped in

March 1938. In that period some 5600 tons of ore had been milled, some 376.8 tons of lead concentrates were produced and shipped, and a smaller quantity of zinc concentrates was produced, of which a considerable part was not shipped.

Concentrates were trucked from the mill (elevation 5200 feet) 3 1/3 miles to Ferguson on the mine road, grade averaging about 15%, thence a further 16 miles by good road via Trout Lake to Beaton at the head of the Northeast Arm of Upper Arrow Lake. Between Beaton and Arrowhead, a local company operates a barge service. At Arrowhead connection is made with Canadian Pacific Railway lake steamer or rail service. An alternative route from the settlement of Trout Lake down the lake of the same name to Gerrard where connection could be made with the Canadian Pacific Railway rail service, would reduce truck haul from about 19 to less than 7 miles; barge haul down Trout Lake would be about equivalent to that between Beaton and Arrowhead. It must be observed however that facilities for barging on Trout Lake do not exist at present and the railroad serving Gerrard is very little used.

By the existing route, freight is costly and a good deal of handling of concentrates is required. If the quantity to be handled were great enough to warrant providing facilities, the Trout Lake route would have marked advantages.

Enough water is available at the mill for domestic purposes and for milling 50 to 75 tons of ore per day. Milling there at a greater rate would require provision for re-use of water, or pumping fresh water for some distance. Power developed at Ferguson amounts to about 250 KVA. Milling in 1937-38 indicated mill capacity of 55 tons in 24 hours and gave information about ore grade and metallurgical results.

In 1938 an engineer reported on the property for the company. Mill bin foundations were then in need of repair, and the location of the flume leading water to the power plant was described as unsatisfactory. Costs were estimated at \$6.00 to \$6.50 per ton, assuming production at 75 tons per day. Cut and fill mining was recommended to permit more complete extraction of the highest grade ore.

Ore Reserves

Positive ore reserves were estimated at 70,000 tons averaging, Gold 0.043 oz. per ton, silver 6.9 oz. per ton, lead 6.0%, zinc 6.7%, with a little copper and some cadmium. This ore lies within a block in the True Fissure vein, 300 feet long, 260 feet measured on the dip, and averaging 7.4 feet wide. The dip is 40 to 45 degrees eastward. Extensions of the True Fissure vein have good prospecting possibilities. The vein has a maximum width of 35 feet and consists largely of quartz with ankerite and siderite. Pyrite, galena, sphalerite, some grey copper and some chalcopyrite occur as banded and lenticular masses in the vein. Some of the galena and sphalerite are intimately intergrown. A short distance to the north, mineralization of similar width in what may or may not be the same vein is incompletely explored in the Blue Bell workings. This section also has prospecting possibilities.

The mill design follows common practice; the flotation cells known as "Venturi Aircell" were used at one other mill in British Columbia, where they gave satisfactory results. At the True Fissure, lead concentrates averaged about 45% lead, and 14% zinc, zinc concentrates averaged 45 to 50% zinc, less than 50% of the total zinc was recovered in the zinc concentrates. It is reported that a new blower was installed in February 1938, and that the grade of lead concentrate improved to 64% lead, and of zinc concentrates to 50% zinc.

The following production data were reported.

Milling January to March 1938

Product	Quantity Dry Weight(1)	Assays				Distribution			
		Gold oz.per ton	Silver oz.per ton	Lead %	Zinc %	Per Cent of Total			
						Gold	Silver	Lead	Zinc
Mill Feed(2)	3450 tons	0.043	6.10	5.09	7.70	100	100	100	100
Lead Conc't.	339.35	0.410	52.26	46.96	14.04	93.8	83.86	90.76	17.4 ₃
Zinc Conc't.	242.70	0.03	7.90	3.55	50.03	4.9	9.07	3.52	45.5 ₀
Mill Tailings	2868	Tr	0.52	0.35	3.45	1.3	7.06	5.71	37.0 ₆

Notes: (1) Estimated weight.
(2) Mill feed assay, calculated.

LEAD CONCENTRATES SHIPPED

	<u>Oct.-Dec.1937</u>	<u>Jan.-Mar.1938</u>	<u>Total</u>
Moisture	9.3%	9.3%	9.3%
Net Weight, dry tons	78.615 ton	298.203 ton	376,818 ton
Assay: Gold	0.393 oz/ton	0.392 oz./ton	0.392 oz/tc
Silver	49.38 oz/ton	52.08 oz/ton	51.52 oz/ton
Lead	42.08%	45.65%	44.80%
Zinc	13.13%	14.18%	14.02%
Copper			2.78%
Sulphur	23.39%	24.35%	23.98%
Silica (SiO ₂)	3.46%	1.72%	2.08%
Iron	12.76%	9.79%	10.38%
Lime (CaO)	Tr	Tr	Tr

Assays of lead concentrates shipped do not agree entirely with mill assays. Records of zinc concentrates shipped are incomplete. It is apparent that mill recoveries and grade of concentrates were such that net returns from concentrates represent a comparatively small part of the gross values of metals in the ore milled. Just what improvement could be made in milling cannot be predicted safely on information now available. According to report (previously mentioned) in March 1938 after installing a new blower, grades of lead and of zinc concentrates were improved materially in regard to the principal base metal. Rejection of zinc from the lead concentrate would make more available for the zinc concentrate, recovery of gold, silver and lead in the lead concentrate might be reduced somewhat. Recovery of zinc in the zinc concentrate would be improved to the degree that zinc excluded from the lead concentrate would be available, but if the higher grade zinc concentrate were due to rejection of middling particles recovery of zinc in the higher grade zinc concentrate would also be affected adversely. It might well be the finer grinding would improve the milling results.

For the purpose of estimating net returns, the following milling results and grades are assumed:

Quantity Dry Weight	Product	Assay				Distribution			
		Gold oz/ton	Silver oz/ton	Lead %	Zinc %	Percent of Total			
		Gold	Silver	Lead	Zinc	Gold	Silver	Lead	Zinc
100 ton	Mill Feed	0.04	6.0	5.0	7.0	100%	100%	100%	100%
7.5	Lead Conc't	0.48	64.0	60%	7%	90%	80%	90%	7.50
8.0	Zinc Conc't	0.03	8.0	2.5%	52%	6%	10.67%	4%	60.01
84.5	Mill Tailings	0.005	0.66	0.36%	2.74%	4%	9.33%	6%	32.5

Realization

Lead Concentrates 7.5 tons @ \$55.80(1)	\$428.50
Zinc Concentrates 8.0 tons @ \$23.80(2)	<u>190.40</u>
Total	\$618.90

Net realized per ton of ore milled say \$6.20.

Notes:

- (1) Pro Forma Settlement for Lead Concentrates follows.
- (2) " " " " " Zinc " " .

The net return based on these calculations does not leave any margin for profit and the calculations assume better mill results than obtained in 1937-38. There are possibilities of improving net return per ton milled; producing a satisfactory recovery in concentrates of better grade, reducing costs of freight, trucking and handling charges, and more favorable smelter contracts, are within the bounds of probability. According to our estimates, freight and trucking charges on concentrates would cost \$1.85 and \$0.25 per ton of ore milled. Some combination of these savings, or an increase of the settlement prices for lead and zinc would be necessary to make the operation profitable.

Pro Formo Settlement for Lead

1 ton dry weight		moisture 10%	
Assay	Gold 0.48 oz/ton	Silver 64.0 oz/ton	Lead 60% (1200 lb)
Less		0.5	1.5

Settlement Assay Gold 0.48/oz/ton Silver 63.5 oz/ton Lead 58.5% 1170 lb

Settlement Prices US Gold \$31.818/oz. Silver 35¢ oz. (6.5-1.5), 5.0¢/lb

Gross Value

Gold 0.48 oz.	\$31.818	\$15.60 U.S.
Silver 95% of 63.5 oz.	@ \$0.35	21.11
Lead 90% of 1170 lb.	@ \$0.05	52.65
	<u>Total</u>	<u>\$89.36</u>
Less Treatment	6.20	
Duty Lead 1170 lb.		
1.5¢	17.55	23.75
		<u>\$65.61</u>
Add Exchange Premium		6.56
		<u>\$72.17 Cdn.</u>
Less Freight, Rail 1.1 ton	13.45(1)	
Barge	1.32	
Trucking	1.60	16.37
		<u>\$55.80 Cdn.</u>
Net Value per ton		
Net Value per pound of lead 5580,	4.65¢.	
	1200	

Note:

(1) Freight rate estimated.

Pro Formo Settlement for Zinc

1 ton dry weight		Moisture 10%	
Assay	Silver 3.0 oz/ton	Zinc 55%	Cadmium 0.3%
Less	4.0		0.25
Settlement Assay	Silver 4.0 oz/ton	Zinc 55%	Cadmium 0.05%
		1100 lb.	1 lb.
Prices U.S.	Silver \$0.35	Zinc \$0.0625	Cadmium \$0.90
Less		0.0025	.45
Settlement Price	Silver \$0.35	Zinc \$0.06	Cadmium \$0.45

Gross Value

Silver 80% of 4 oz. @ \$0.35		\$1.12
Zinc 80% of 1100 lb. @ \$0.08		70.40
Cadmium 50% of 1 lb. @ \$0.45		.22
		<u>\$71.74 U.S.</u>
Less Duty, 1100 lb. zinc @ 1.2¢	13.20	
Treatment	27.13	40.33
		<u>\$31.41 U.S.</u>
Add Exchange Premium		3.14
		<u>\$34.55 Cdn.</u>
Less Freight - Rail (1.1 ton)	7.90(1)	
" Barge	1.32	
Trucking	1.60	10.72
		<u>\$23.83</u>
Net Value per ton		\$23.83
Net Value per pound zinc	$\frac{2383}{1100}$	2.165¢.

Note:
(1) Freight rate estimated.

Vancouver, B.C.,
June 11, 1942.

H. Sargent,
Mining Engineer.