

CORPORATION FALCONBRIDGE COPPER

FILE

MEMORANDUM

DATE: July 8, 1983
TO: D. H. Watkins
COPIES TO: M. J. Knuckey
DE FROM: A. J. Davidson
SUJET SUBJECT: PEPPA RESOURCE PROPERTY, MT. SICKER NTS 92B/13

827399

Summary

The Peppa Resources property consists of 77 mineral claims located on the slopes of Mt. Sicker near Duncan B. C. The property contains the Lenora and Tyee mines which produced 305,787 tons of 3.31% Cu, 7.51% Zn, 2.75 oz/ton Ag and 0.13 oz/ton Au.

While various companies have held the property over the years past exploration work has been inconsistent and of poor quality.

No comprehensive mapping and lithogeochemical sampling program has been done on the property.

The property is underlain by highly sheared and hydrothermally altered felsic - intermediate volcanics which are infolded with coeval and conformable gabbro-diorite sills. The orebodies occur along a graphite-pyrite horizon in the volcanics and seem to be spatially related to these sills.

Potential to find both extensions of the known orebodies and other orebodies on the same horizon is excellent. Potential on the rest of this large property for other horizons etc. is wide open.

The terms agreed on by Peppa and ourselves while steep are not out of line when the size of the property (4000 acres), its history and above all its awesome potential are taken into consideration. A budget of \$250,000 is proposed for 1983 which includes 500 km of Digheem, 70 km linecutting, 600 m of drilling and Pulse EM as well as mapping and sampling. There is little doubt that Mt. Sicker will host our first orebody in B. C.

Location and Access

This 4000 acre property covers most of the north and east slopes of Mount Sicker near Duncan, B. C. and is adjacent to our Postuk-Fulton Option. Access is by 4 wheel drive vehicle. (Figure 1).

Claims

Appendix A lists the claims which comprise the property. All the mining claims listed are held by Peppa Resources. However some of these mining claims only contain rights to the precious metals and not to the base metals. Figure 2 shows on which claims Peppa has base metal rights.

History and Previous Work

The property contains the Lenora, Tyee and Richard III deposits which have produced a total of 305,787 tons of ore grading 3.31% Cu, 7.51% Zn, 2.75 oz/ton Ag and 0.13 oz/ton Au since the late 1800's . A summary of past work on the property is attached as Appendix B.

Geology

The Peppa property and our adjacent Postuk-Fulton Option are underlain by Sicker volcanics of Carboniferous age. The Sickers host Westmin Resources Buttle Lake deposits and their new Thistle property. Exploration activity in the Sickers is extremely intense and competitive and the rocks underlying the Peppa property are the best looking volcanics seen thus far in B. C. Quartz eye rhyolites, rhyolite and andesite tuffs and accompanying graphite and sulphide exhalative horizons are infolded with coeval gabbro sills (Figure 3). As at Winston Lake, I suspect the gabbros to be slightly younger than

at least the felsic volcanics. Previous mapping (Ducanex and S.E.R.E.M.) shows an outcrop pattern of volcanics and gabbro that immediately suggests isoclinal type folding that is likely to repeat favourable horizons over short distances. This is the same conclusion reached after logging four holes drilled on the Postuk-Fulton Option (cf AJD memo May 20/83).

These volcanics are intensely sheared and altered and almost no soda is present in the rocks sampled thus far. However their unaltered equivalents (taken at Maple Bay, 10 km away) run from 2.8 - 4.0% Na₂O (Table I). The shearing present is probably related both to the intense hydrothermal activity in the area and the tight style of folding.

Mineralization

Two orebodies (North and South) made up the Lenora and Tyee mines. Both occurred on the same horizon at fold hinges. The South occurred at a higher elevation (Figure 4).

Ore from the Lenora and Tyee was of two types a) barite ore - fine grained, well banded pyrite, chalcopyrite, sphalerite in a barite-quartz-calcite gangue and b) quartz ore - pyrite and chalcopyrite in a quartz gangue (stringer?) (Table 2). From Stevenson's description of the distribution of this quartz ore with respect to the barite ore it would seem that these south dipping orebodies are overturned (Figure 5) and may actually be on the overturned limb of a gabbro centred syncline. Figure 6 is a north-south cross-section through the orebodies showing how the North orebody and accompanying graphite schists thicken in the minor drag folds (a la Coniagas?) and then is cut off by the "Mine Fault". I suspect strongly however that this "Mine Fault" is just the result of tight folding in the area and subsequent slipping. The South orebody is thus the downdip extension of the North orebody and not a separate orebody at all. Sections of barite drag ore may be seen in this "Mine Fault" (Stevenson 1945) which also suggests that it is a sheared fold limb. The fault? which cuts the South orebody off on the south may be the same thing.

Potential

A Mine Area - One hole (MS 74-2) has been drilled to test the downdip extension of the South orebody. Although collared in gabbro the hole did intersect a section of volcanics before passing thru a gabbro dike. No other drill holes have followed this up. The South orebody has been caved since 1940 and it is unlikely that much underground drilling had been done to the south prior to this. S.E.R.E.M. did cover the downdip extension with geophysics (Low power DEEPEM and VLF) but if the orebody is indeed overturned and is lying on the south limb of a syncline the downdip extension could be well below the range of most geophysics even without much slippage. Also all of S.E.R.E.M.'s holes along the "mine horizon" were drilled from the north making it very difficult to intersect a south dipping zone. No downhole PEM was done.

B Elsewhere - S.E.R.E.M. drilled a total of about 3000 m. (21 holes) on the property during the 4 years they had it under option. (Total S.E.R.E.M. expenditures \$850,000.) Almost all of these were on low power PEM and IP targets and about half the holes were on the Mine horizon. The PEM surveys were carried out by Glen E. White and their quality leaves much to be desired. The potential of the rest of the property is thus wide open.

Excellent geological-geochemical targets are already in place on the Postuk-Fulton Option. Hole S72-1 intersected 10 m. of 0.41% Cu in a pyritic graphitic schist on the PF option. No follow up holes were done.

The Northeast Copper Zone is an area of old workings in the northeast part of the property. Cherty pyrite bands are present in the area and selected samples have run as high as 2% Cu and 0.3 oz/ton Ag. The old Fortuna adit apparently contained copper veins up to 20 feet wide. Although S.E.R.E.M. thought highly of this area only limited work was done.

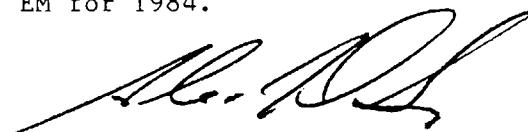
The remainder of the property has been mapped by S.E.R.E.M. as a series of sericite and chlorite schists and has been covered with VLF. It is essentially wide open highly favourable ground.

Conclusions

The Peppa Resources property on Mt. Sicker contains three old mines which together produced 305,787 tons of 3.31% Cu, 7.51% Zn, 2.75 oz/ton Ag and 0.13 oz/ton Au. The orebodies are overturned and occurred with pyrite - graphite exhalites in a sequence of quartz eye rhyolites, tuffs and andesites. The rocks are hydrothermally altered and intruded by coeval gabbro sills. These volcanics and gabbros have been isoclinally folded and sheared in such a way that it is likely the ore horizon will repeat elsewhere on the property. Due to poor quality exploration by previous optioners the potential for discovering extensions to the old orebodies and new ore on the property is excellent.

Recommendations

1. Option the property from Peppa Resources (A copy of the letter of intent sent to Peppa is attached as Appendix C).
2. Initiate a compilation of all previous work on the property.
3. Construct a series of cross sections through the orebodies based on the old plans and a relogging of S.E.R.E.M.'s holes.
4. Detail map and sample the immediate area surrounding the orebodies especially to the south and to tie in with work completed on the Postuk-Fulton Option.
5. Drill a couple of holes (600 m total) to determine stratigraphy south of the orebodies and to test for the ore horizon.
6. Downhole Pulse EM is appropriate holes and surface DEEPEM in selected areas.
7. More drilling and Pulse EM for 1984.



A. J. Davidson

TABLE 1

	<u>Quartz Eye Rhyolite</u>		<u>Basalt</u>	
	Unaltered	Altered	Unaltered	Altered
SiO ₂ %	75.7	69.3	52.6	43.7
Al ₂ O ₃ %	13.0	13.2	16.0	16.8
CaO%	2.29	0.31	9.18	0.88
MgO%	0.49	2.42	6.30	10.06
Na ₂ O%	4.04	0.65	2.78	0.10
K ₂ O%	1.19	2.99	0.06	1.73
Fe ₂ O ₃ %	1.06	6.04	10.1	16.35
MnO%	0.03	0.07	0.15	0.36
TiO ₂ %	0.18	0.20	0.68	1.23
Ba ppm	N/A	1674	N/A	904
Cu ppm	11	599	47	294
Zn ppm	4	63	27	84

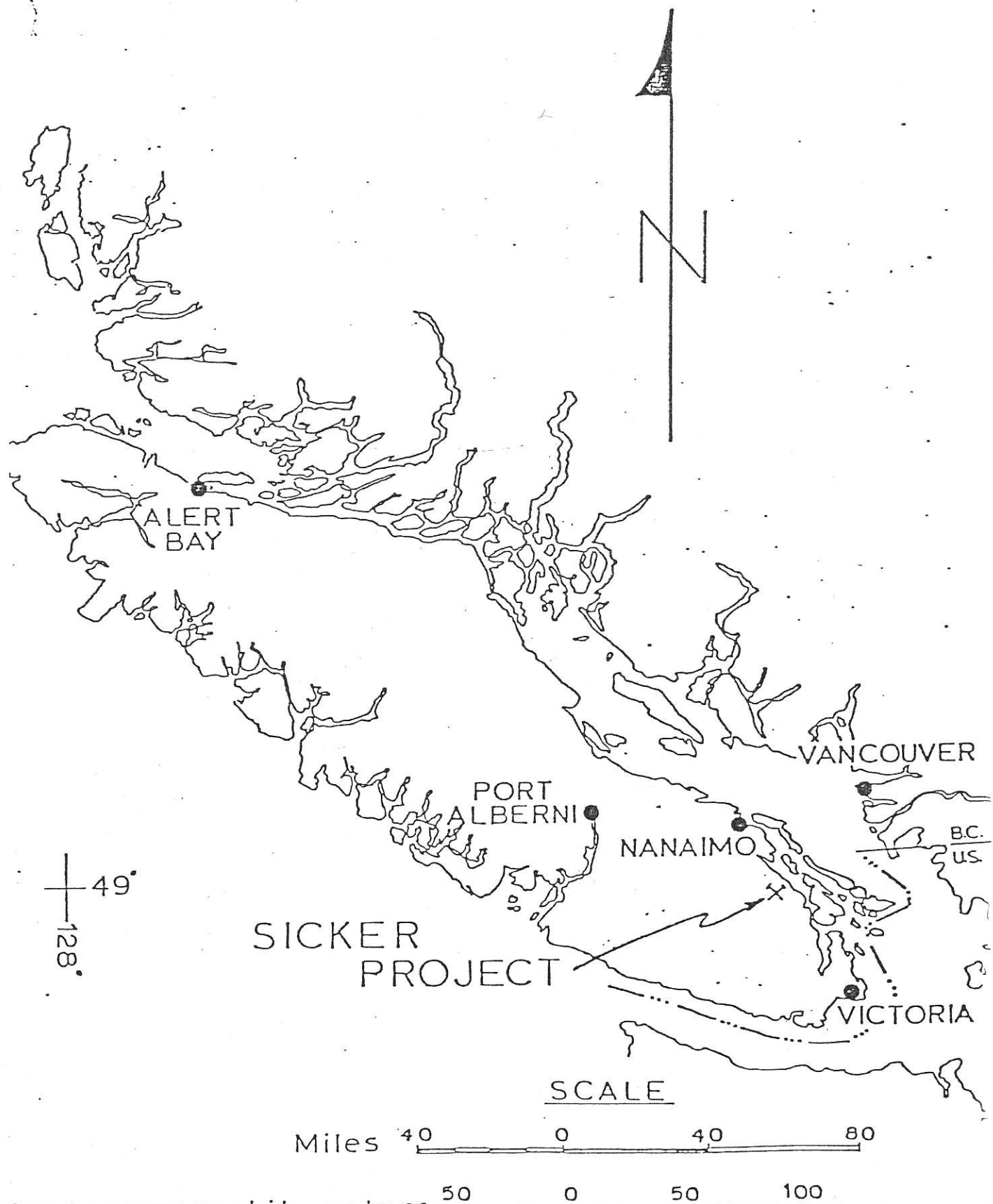
TABLE 2 - ANALYSES OF MOUNT SICKER ORES
(from Stevenson 1945)

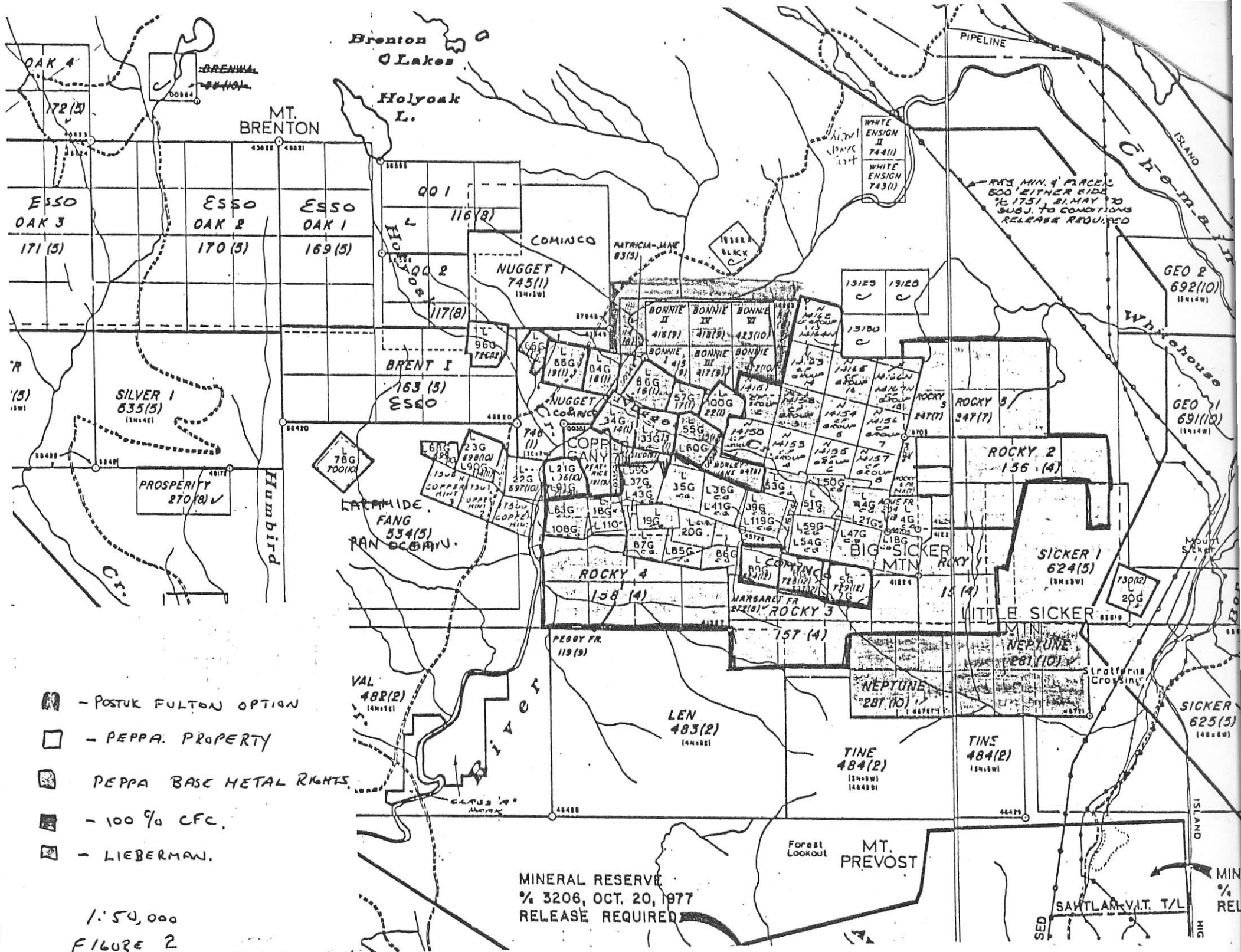
	1	2	3	4	5	6	7	8
Gold, oz/ton	0.14	0.075	0.20	0.01	0.01	0.03	0.026	0.04
Silver, oz/ton	2.87	2.05	4.0	4.8	0.3	1.5	3.6	0.9
Copper, per cent	4.56	1.32	1.05	2.06	0.84	2.10	0.86	7.06
Lead*, per cent	--	0.6	0.4	2.3	1.0	0.9	1.1	trace
Zinc, per cent	--	6.12	7.6	19.7	8.8	12.3	17.8	0.21
Iron, per cent	--	--	21.9	5.23	8.59	4.77	3.42	8.43
Lime, per cent	6.60	--	--	--	--	--	--	--
SiO ₂ , per cent	13.50	--	6.10	13.20	2.88	9.62	4.40	68.14
BaSO ₄ , per cent	37.30	--	26.3	32.5	59.3	51.9	47.7	1.12

1. - Average assay of ore from Tyee mine during 1904, quoted by Musgrave (op. cit.) and probably mostly from South orebody.
2. - Average assay of ore mined by Twin "J", 1943-44, mainly from North orebody. (C. Rutherford, personal communication).
3. - 'Barite ore', North orebody, No. 2 Level
4. - 'Barite ore', North orebody, No. 2 Level
5. - 'Barite ore', North orebody, No. 2 Level
6. - 'Barite ore', South orebody, 0 Level (Tyee 200)
7. - 'Barite ore', South orebody, 0 Level (Tyee 200)
8. - 'Quartz ore', North orebody, No. 2 Level

Location Map

Fig. 1





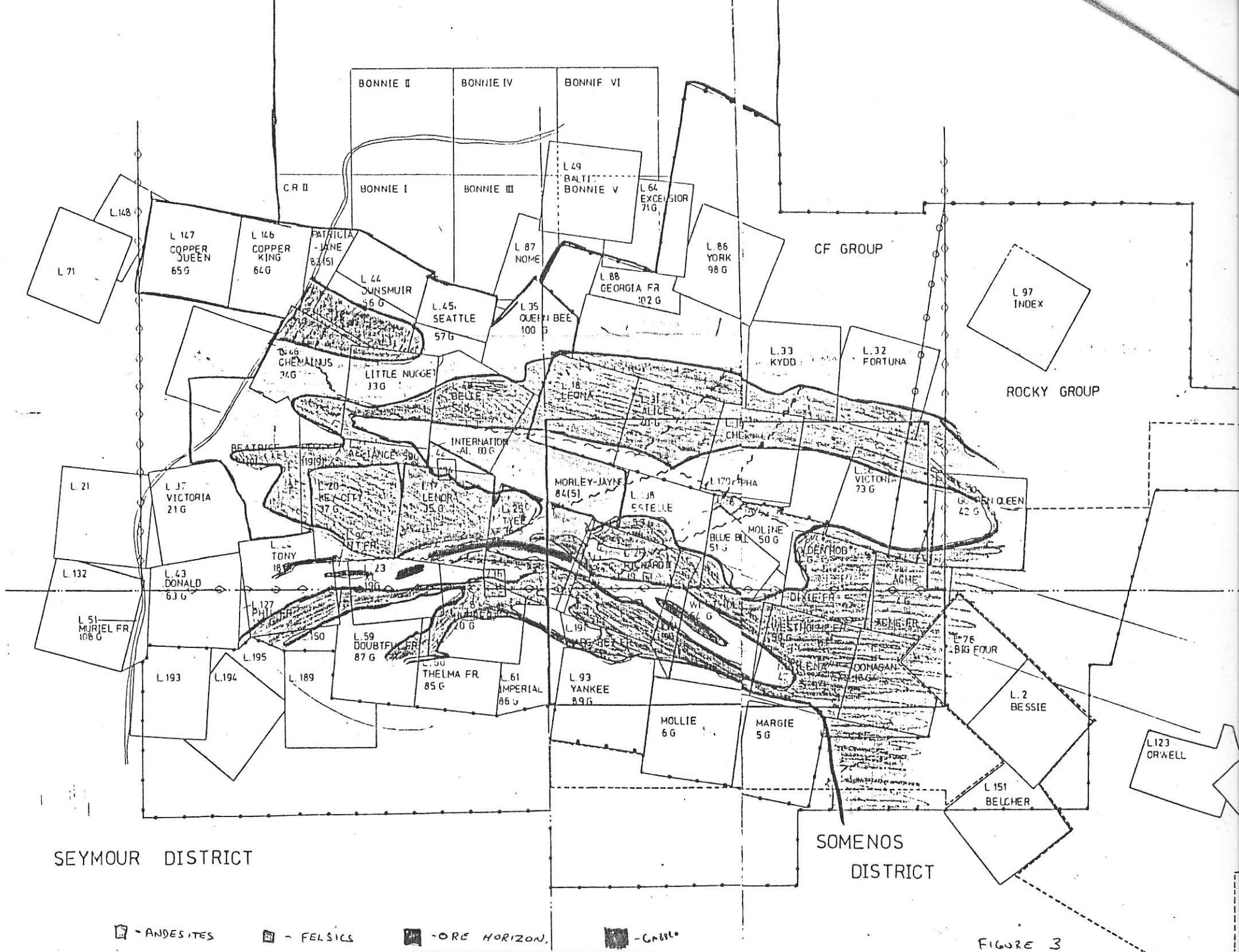


FIGURE 3

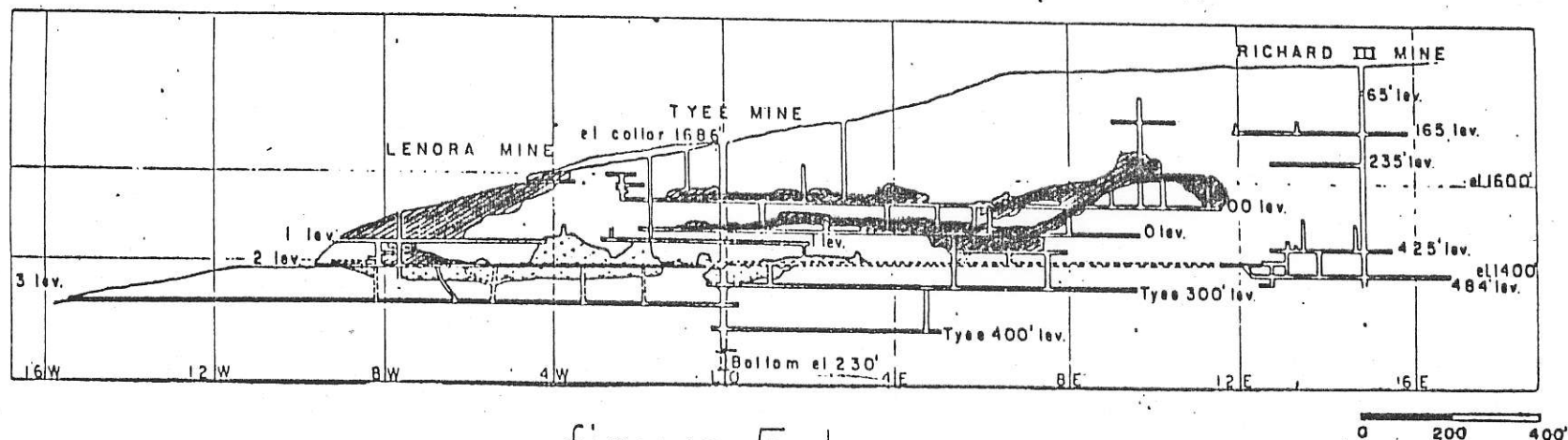
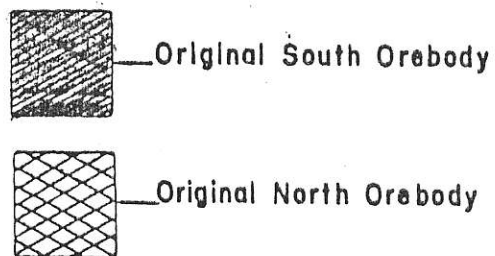


figure 5-1

MINE WORKINGS IN LONGITUDINAL SECTION

PEPPA RESOURCES LTD.



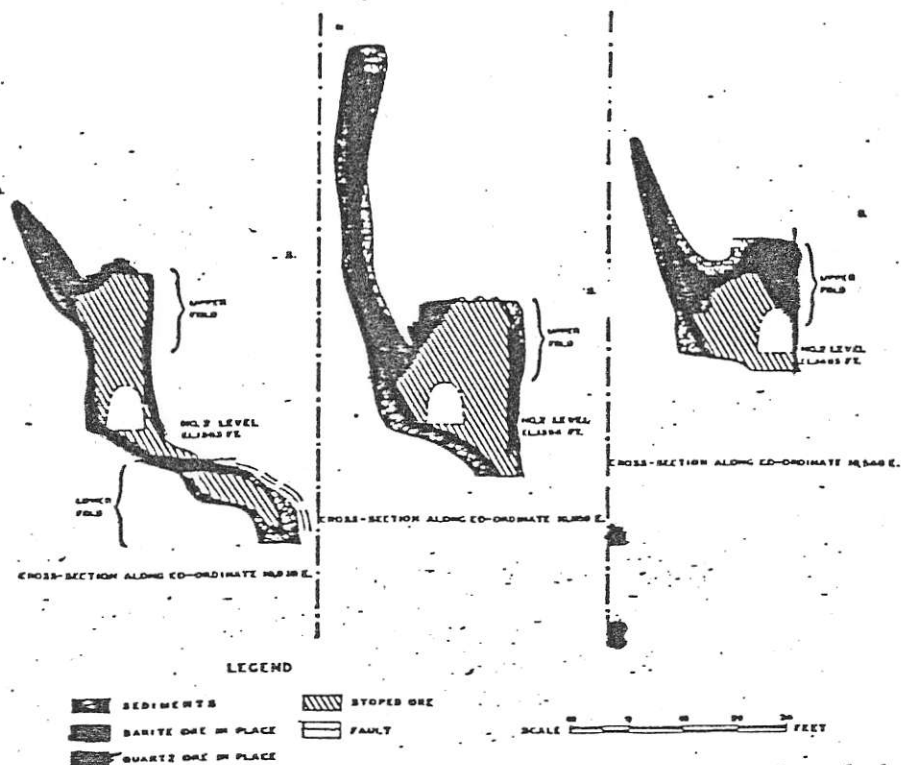


Figure 5.—North-south cross-sections through stopes on North orebody, showing details of drag fold in this orebody.

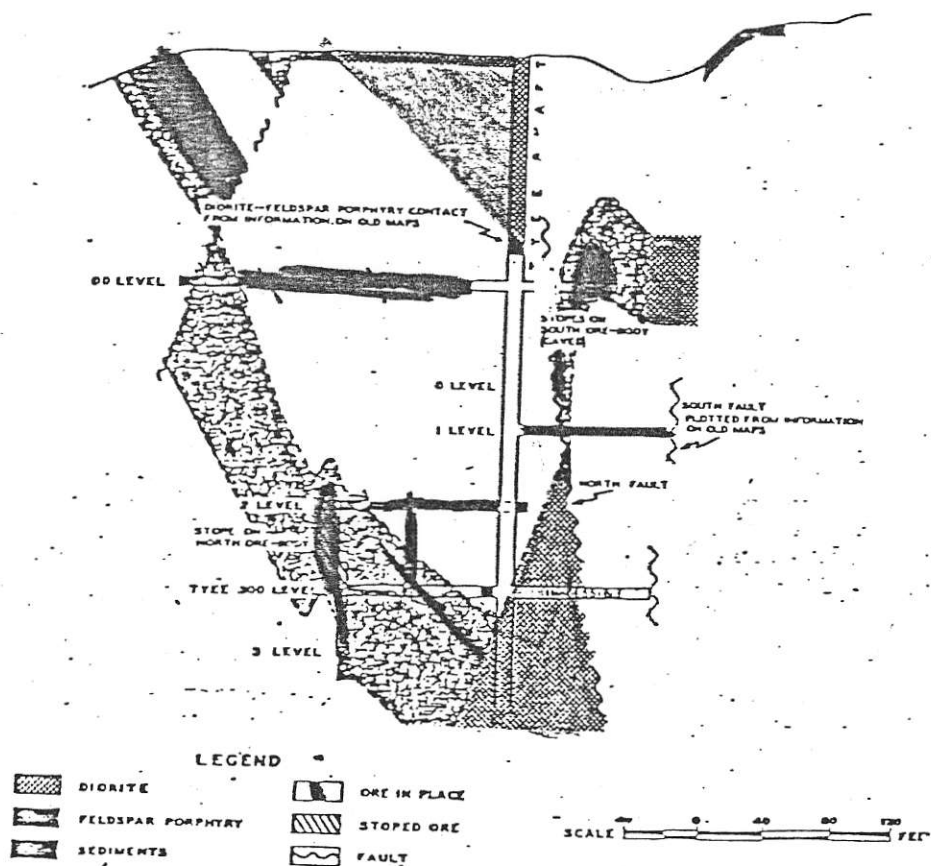


Figure 6.—North-south cross-section through the Tyee shaft, showing stopes on the North and South orebodies. Information not found in those workings in the plane of sections has been compiled from diamond-drill hole data and from nearby cross-sections.

SCHEDULE A

Crown-Granted Mineral Claims

Name	Lot No.
Estelle	53-G
Westholme	54-G
Blue Bell	51-G
Moline Fraction	50-G
Acme	4-G
Tony	18-G
Hellena	47-G
Westholme Fraction	59-G
Dixie Fraction	21-G
Golden Rod	44-G
Donagan	18-G
XL	19-G
Donald	63-G
Muriel Fraction	108-G
Doubtful Fraction	87-G
Thelma Fraction	85-G
Imperial Fraction	86-G
Herbert Fraction	20-G
Phil Fraction	110-G
NT Fraction	43-G
Magic Fraction	41-G
Richard III	39-G
Key City	37-G
Lenora	35-G
Tyee	36-G
International Fraction	60-G

Two-Post Claims

Name (No.)	Record No.	Expiry Date
C.F. Group 1-8 (8)	N14150-N14157	1986
C.F. Group 13-18 (6)	N14162-N14167	1985

Name (units)	Record No.	Expiry Date
Rocky 1 (4)	155(4)	April 20, 1986
Rocky 2 (8)	156(4)	April 20, 1986
Rocky 3 (8)	157(4)	April 20, 1986
Rocky 4 (8)	158(4)	April 20, 1986
Rocky 5 (6)	247(7)	July 6, 1986
Rocky 5 Fraction (1)	248(7)	July 6, 1986
Acme Fraction (1)	254(8)	July 7, 1984
Lawarance	730(12)	Dec. 30, 1983

APPENDIX B

LENORA

- 1898 Drifting, crosscutting and sinking. Two parallel ore zones identified.
- 1899 Development and stoped ore stored in dumps. Some handpicked ore sent to a smelter.
- 1900 Lenora-Mount Sicker Mining Company formed. Development to and stoping continued. Shipped ore by wagon, narrow-gauge railway, E & N Railway to Ladysmith thence by steamer to Van Anda, Everett and Tacoma smelters.
- 1902 Railroad completed to the mine. Smelter completed at Crofton. Shortly after shipments commenced to Crofton the mine was closed because of litigation.
- 1903 Minor work done and small shipments of ore from the dump to made to Crofton.
- 1907
- 1924 Re-opened under lease and bond by R. G. Mellin, primarily to re-examine the north ore zone, which was reported to assay 2% copper, 7% zinc, with \$1.50 in gold and silver. This ore had become attractive because of advances made in separating copper and zinc by flotation.
- 1925 No work.
- 1926 Ladysmith Tidewater Smelters Ltd. took over assets of Tyee mine and smelter and leased the Lenora. Under the direction of R. G. Mellin an adit was started on the Lenora to connect both mines to provide efficient working conditions.
- 1929 The lease on Lenora was dropped and work ceased.

TYEE

- 1897 Explored and developed the property with drifts, crosscuts to and shafts. Made a small shipment of sorted ore in 1901, 1901 which ran 8% copper, \$5 in gold and \$5 in silver per ton. The bulk of production stored in surface dumps.
- 1902 Completed construction of aerial tramway to Somenos where ore was transshipped by Tyee Smelter to Ladysmith. A 1907 1250 foot shaft sunk to develop lower grade ore zone

found on 1000, 1150 and 1250 levels. Much development, exploration and production during these years. Concentration tests were being made on low grade ore when mine closed due to low price of copper. Work done on Tony, XL, Key City and Westholme claims disclosed some copper mineralization.

1898 Developed and explored sporadically but lacked sufficient
to working capital for efficient operations. Shipped some
1907 ore from dump to Tyee Smelter. When work stopped ore
was showing on floor of the 500 level.

Plans of the early development work, particularly that undertaken in the deeper parts of the Tyee shaft and on levels and winzes below the general Lenora-Tyee 200-Horizon, are apparently non-existent. However the Minister of Mines reports provide some rather general information on the early development results.

- 1903 (a) Initial development operations within the Tyee (South) orebody showed it to have a maximum width of 40 feet, with general average widths of 25-30 feet.
- (b) At the bottom (closely below the 400-foot level) of the Tyee shaft green schists carrying about 2% copper were encountered—similarly mineralized as the schists flanking the ore lenses in the upper levels.
- (c) Throughout Lenora 3-level mineralization of the schists was observed at several places, but did not constitute ore of shipping (min. 4% Cu) grade.
- (d) Schists intersected by winze and crosscut 100 feet below Lenora 3-level showed marked mineralization, and appear to be looser (effect of folding-crumpling) than at any other point below 2-level.
- 1905 At the 1000 ft. level about 3 ft. of mineralized rock (Cu-Au-Ag assoc. with barite) was intersected 205 ft. south of the shaft.
- 1906 The same "low grade orebody" was intersected at the (Tyee) 1250-foot level ... as had been intersected at the 1000 ft. and 1150 ft. levels.
- 1924 Victoria interests undertook further exploration of north
to ore zone through drifting, crosscutting and sinking after
1925 which no further work done until the beginning of World War II.

- 1928 Tyee holdings taken over by Pacific Tidewater Mines Ltd. which then obtained from Mellin the Lenora lease. The adit being driven on the Lenora towards the Tyee was continued and ore was encountered.
- 1929 Pacific Tidewater Mines, Ltd. taken over by Ladysmith Smelters, Ltd. No work done on Tyee or Lenora, and Lenora lease dropped.

SHEEP CREEK GOLD MINES LTD.

- 1939 Sheep Creek optioned Lenora, Tyee and Richard III.
- 1940 A considerable amount of diamond drilling and development was done before option dropped due to low zinc price. Geophysical survey (April 1940).

TWIN "J" MINES LTD.

- 1924 Taken over by Twin "J" Mines Ltd. who drilled and sampled to followed by underground rehabilitation and preparation of mine site. Milling began in mid 1943 and 125-150 tons daily. Much exploration and development done. Operations suspended in 1944 when sales contract with Wartime Metals Corporation was cancelled. Most production came from the Lenora North ore zone.
- 1946 Retimbered underground operations. Mining and milling resumed. Concentrate shipped to Tacoma and Trail. Closed in September.
- 1947
- 1949 Property taken over by Vancouver Island Base Metals, Ltd. They repaired Tyee shaft, retimbered tunnels, developed and drilled before ceasing work.
- 1951 Re-opened and milled 9,754 tons. Modest exploration program carried out. Closed in January 1952.
- 1952
- 1964 The present interests blasted an outcrop on the Lenora and shipped 167 tons to Tacoma Smelter. Subsequently, Mt. Sicker Mines Ltd. was formed to work the property.
- 1966
- 1967 A feasibility study has been made with regard to leaching of copper from the ore zones and dumps.
- 1968 A V.L.F. magnetometer survey was carried out by Mt. Sicker Mines outlined strong conductors to the north and south of the main ore zone. A magnetometer survey was carried out over portions of the claim block. Some stripping was carried out over area of #2 portal.

- 1969 DDH's number S-1 and S-2 were drilled. Hole S-2 encountered mineralization from 59 to 87 feet. Assay #4756, 80.5'-87.0' graded Au 0.19, Ag 2.50%, Cu 3.10%, Pb trace, Zn 10.40%, BaSo4 38.20%. DDH's S-3 and S-4 stopped before objectives completed.
- 1970 Magnetometer and V.L.F. surveys completed over 30 line miles. Geological Mapping. Three X-Ray diamond drill holes totalling 250' in N.E. showings.
- 1971 Geochemical soil sampling for copper and zinc revealed several targets. Bulldozer trenching on N.E. zones, north of Westholme shaft and north of Richard III shaft.
- 1972 Ducanex optioned Mount Sicker property. Grid was expanded and geologically mapped by Ivor Watson. A C.E.M. survey was completed over property revealing no anomalies. Approximately 3000 feet of diamond drilling in 5 holes completed.
- 1973 IP survey over N.E. zone.
- 1974 Assessment Report #5164 indicates diamond drilling of eight holes by Dresser Industries. Drill holes MS 74-1 through MS 74-8 were relogged and results are included in Appendix 2.
- 1978 Esso Minerals Ltd. tested an Apex Parametrics Maxmin II on Mt. Sicker by running 4 test lines across the strike of the orebodies between the Lenora #3 adit and the Tyee shaft. Near the Lenora #2 adit ore is near the surface and the instrument responds well with both the in-phase component and the out-of-phase component. However, on a line crossing near the top of the Tyee shaft, where the orebodies are (or were) at a depth of between 100 and 400 feet below surface no response was obtained.

The Mt. Sicker claims were optioned by S.E.R.E.M. Limited of Vancouver, B. C. in 1978. During the period of their option (1978-1981), S.E.R.E.M. completed surface geological mapping, geochemical surveys, VLF-EM surveys Vector Pulse EM surveys, Maxmin EM surveys, Induced Polarization surveys, magnetometer surveys, diamond drilling re-logging of previous data obtainable. Much of the work was concentrated on the regions adjacent to the old mine workings but no attempt was made to rehabilitate the old workings or do underground geological mapping.