CRESTON ZINC
AHO - APR 20-1964

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SUMMARY

The Liz-B zinc property, 8 miles NNW of Creston, B.C., is ideally situated near the main highway about 75 miles from the smelter and zinc plant at Trail, B.C.

It contains zinc and minor lead mineralization or occurrences within a strike distance of some 5000 feet and a vertical range of 1200 feet or more. The main showing consists of a zone that may have a overall length of 1000 to 1200 feet, and a width in the order of 6 feet or more. Within this a continuously exposed section that was sampled averaged 5.5% to 6% combined zinc and lead (zinc with minor lead) across 6.0 feet for a distance of 200 to 250 feet.

More and better mineralization may occur, and the zone is completely open especially downhill. The property is considered to be an attractive exploration bet for finding larger tonnage with comparable or better grade suitable for a low grade zinc producer.

It is recommended that $10,000 be spent in a first stage of careful geologic and geochemical work and limited bulldozer trenching and sampling, which would determine the justifiability and extent of a second stage of drilling, to be followed by underground exploration and development if justified.

REPORT ON

LIZ-B ZINC PROPERTY

CRESTON, B.C.

by

A. E. AHO

April 20, 1964

INTRODUCTION

With the present demand for zinc, the Liz-B property with its proximity to the smelter at Trail has interesting economic possibilities.

At the request of S.W. Barclay of 903 Mill Street, Nelson, B.C., owner of the property, the writer, Gordon Davis, and Dirk Tempelman-Kluit examined the property with Barclay November 2 and 3, 1963. Two full days were spent on the property and one day total time was spent in laboratory work.

GENERAL CONDITIONS

The property is situated on the main highway at Wilds Creek, 8 miles NNW of Creston, and about 75 miles from the smelter at Trail, in the Nelson mining division of southeastern British Columbia.

It is easily accessible by passenger automobile from the highway and by private logging road from a point ¼ mile up Duck Creek.

The mineralized zone extends from about 1800 feet elevation below the highway up a moderately steep south-facing slope to the main showing at about 3000 feet elevation, 1100 feet above the highway.

The topography is favourable for development along the mineralized zone but is locally disadvantageous for drilling where the creek gully of Wilds Creek follows the zone.

Most of the slope is mantled with moderate overburden especially over the mineralized zone which is exposed only at the highway and in two other localities on the hillside aside from the upper main showing area in the creek.

Timber is easily available in the area. Sufficient water for diamond drilling is said to be available in Wilds Creek the year round, or could be obtained from the spring at about 2880 feet elevation, but contamination of farm water supply will have to be avoided. Water for milling would be available from Duck Lake or the Kootenay River.

The property is ideally situated for exploration, development and mine operation, with easy access to most facilities.

HISTORY AND PROPERTY

The property is described in the Minister of Mines report for 1924 as the Sarah and Ruby claims owned by James Tiyo, who apparently did most of the original work, consisting of open cuts and two short adits (the upper adit is apparently the Sarah adit referred to in the report).

S.W. Barclay first prospected the property in 1949, staked it in 1954, and six diamond drill holes were drilled by Merv Keyes of Newmont in 1954.

In the fall of 1961 the property was restaked by Mrs. Barclay and two drill holes, Liz-B 1 and 2 were drilled by Sheep Creek Mines in November and December 1961. The property has also been briefly examined by Canex in 1961 and by Cominco in 1962.

The property now consists of Liz 1 to 4 claims, No.'s 6582-6585 inclusive, held by location, in the Nelson Mining Division.

GENERAL GEOLOGY (See geologic map of area by Dirk Tempelman-Kluit)

Lithology

Dolomatic limestone, calcareous quartzite - The two calcareous units are of economic interest since it is in these that mineralization has been located at several places. The calcareous layers vary somewhat in thickness, but are generally about 200 feet thick: they trend roughly N 30° E and have steep dips to the southeast. As they are lithologically alike they are described together. In general the rock is a poorly foliated, white to cream colored, buff weathering, fine-grained quartz carbonate aggregate. Relative proportions of these minerals vary considerably. Small anhedral pyrite grains are sparsely disseminated through the rock in many outcrops. In some outcrops of these calcareous rocks tremolite and actinolite can be identified, they appear localized along the foliation of the rock and are probably the result of hydrthermal activity.

Micaceous quartzite, Quartz mica schist - West of the western most calcareous band are quartzites and schists. The contact between the two units appear conformable where seen. The quartzite-schist unit narrows to the south but has an average thickness of about 1000 feet: it trends N 30° E and has an overall vertical dip. The unit is made up of dull grey, fine-grained, well foliated, poorly lineated, well jointed muscovite quartzite and quartz muscovite schist. Some very massive, non micaceous grey quartzite occurs but is not common. A few layers of chloritoid schist are also found.

Black slate, Grey phyllite - Between the two carbonate layers and east of the eastermost one are slaty and phyllitic rocks.

Whereever they were seen, contacts are conformable and the rocks trend N 30° E and have vertical or steep southerly dips. Slate is fine-grained black, well foliated, generally unlineated and contains up to 2 and 3 percent indgenuous pyrite. The rock weathers rusty brown. Phyllite is light grey or greenish grey and also well foliated. The rock has the sheen characteristic of phyllites. Some of the phyllites have large flakes of dark green chloritoid in them.

Gabbro-diorite - Sills of a dark green fine-grained to aphanitic pyroxene ?,.olivine rich rock crops out at several places in the area. Thickness of the sills varies from 1 foot to 50 feet. The sill near the main showing contains a fair proportion of pyrite which is thought to be secondary and perhaps a hydrothermal product.

Metamorphism

The rocks described above attest to low grades of regional metamorphism. The presence of chloritiod, the brittle mica that is typically found in stress environments, helps to pinpiont not only the facies of metamorphism, which is greenschist, but also the subfacies - the quartz-albite-epidote-biotite subfacies.

Structure

Minor structures are restricted largely to foliation, which is very uniform. The foliation that has been measured and which is shown on the accompanying map is probably parallel or nearly parallel to bedding. In the few cases where the two could be distinguished with certainty this relationship holds. General strike of foliation is N 30° E and dips are vertical or steep to the southeast.

Linear structures are restricted to a few lineations, which do not fit any recognizable pattern, and fold axes. Minor folds where seen are quite isoclinal with an amplitude to wave length ratio of 5:1. These minor folds are quite regular; they plunge to the northeast at roughly 30°.

The sense of the few minor isoclinal folds that were observed is southeast up and northeast down in the quartzites west of the calcareous rocks and northwest up and southeast down in the argillic rocks east of the calcareous layers.

A weak late phase of the folding with steep plunge to the southwest has produced open warps with an amplitude wave length ratio of $\frac{1}{4}$:1 superimposed on the isoclinal folds.

Jointing is common in the quartzites. Although no exhaustive study has been made one set of jionts, which strikes S 60° E with near vertical dips appears to be widespread.

The geologic map suggests that the two calcareous bands may join to the southwest and that they are in fact only the limbs of an isoclinal synform and therefore represent the same stratigraphic unit. The analysis of minor structures, which is admittedly scanty, supports this suggestion. As stratigraphic tops were not determined in the area it is not possible to say whether the synform is a syncline or an overturned anticline. The synform may have a plunge similar to that of the minor folds observed in the area (i.e. 30° to the northeast). The fact that the rocks east and west of the synform outlined by the calcareous bands are lithologically differant does not rule out the possibility of a synform since shearing on the limbs could easily remove one or the other of the units.

MINERALIZED ZONE

Mineralization occurs in two NE striking limestone bands.

Eastern Mineralized Zone

At about 3200 feet elevation in the most easterly limestone band (up to 200 feet thick) mineralization consists of pyrite with minor tetrahedrite, galena and sphalerite from which old assays are reported up to 4.5% copper and 8 to 12 oz/ton silver, and from which Barclay reports 1.3% zinc and 2 to 4 oz/ton silver in pyrite mineralization on the dump of the workings on the road.

A number of old trenches, pits and workings blasted into the altered crystalline limestone were not examined.

Further work on the property should include carefull geologic mapping and examination of this limestone band for structure and alteration that may indicate more favorable conditions for mineralization than those that are apparent upon casual examination of the upper showings.

A mineralized zone in this limestone band, exposed 1200 feet lower in elevation at the main highway, shows a width of 20 to 30 feet of rusty oxidized material from which Barclay reports grab samples assaying 3%, 5% and 6% zinc. No attempt has been made to sample this section representatively due to its location. Old workings and another minor galena showing are reported below the highway. This mineralization is located near the nose of the probable synclinal fold.

Main Mineralized Zone (See plan and section of main showing)

The main mineralized zone is a limy quartzite and dolomitic limestone band or bands varying from a few feet to a few tens of feet in thickness and striking N 20-40° E up the hill and dipping 40 to 90° east.

Variations in attitude reflect the structural elements described in the preceding section on general geology.

Between the highway and the main showing area the zone is almost entirely unexposed except for a minor galena showing reported near a water tank about 1500 feet horizontally and 500 feet vertically from the highway, and an altered, slightly mineralized zone exposed at a spring about 2200 feet horizontally and 900 feet vertically from the highway.

The main showing consists of an oxidized mineralized zone exposed intermittently for 1200 feet at a distance 4000 feet north and 1100 feet vertically above the highway. Mineralization consists of medium to fine-grained, pale sphalerite and pyrite with occasional traces of galena in replacements and stringers in a finely-banded, altered limy argillite or limestone varying from a few feet to perhaps 50 feet in thickness. Along part of the zone the footwall is marked by a gabbro-diorite sill while the hanging wall is marked by quartzite or vein quartz.

The zone is exposed only in old trenches, and in a couple of old adits, and has been intersected by several diamond drill holes at its south and north ends but not in its wider middle section.

The trenches were cleaned out, during the examination, channel-sampled by Aho and Davis and plotted on the accompanying plan. Nearly all of the zone is intensely oxidized except for some residual nodules of probably lower than average grade. Zinc may be leached to an indeterminate degree from these surface trenches.

The footwall side of the zone is sparsely mineralized but a definite continuous section along the hanging wall side averaged 5.5 to 6% combined (zinc with minor lead) across 6.0 feet for a distance of 200 to 250 feet. An x-ray study of the sphalerite showed a unit cell dimension which, assuming absence of manganese and a probable iron content of 1%, indicated a cadmium content of 3 plus 1 mo 1% of Cds or a Zn/Cd ratio of 1/.03. Check chemical assays showed a true ratio of 1/.005. Silver content is reported to vary from a trace to 2 or 3 oz/ton (BCMM Rept., 1924).

Above this sampled section the zone passes under the creek bottom and then into a landslide area where it appears to be much wider and where high grade float occurs in the landslide in the creek. An average grab sample of the slide material in one place in the creek assayed 1.4% combined. This unexposed section may be the 60 foot width referred to as the indicated width of the mineralized zone in the 1924 Minister of Mines report.

This apparent widening of the zone may reflect a fold or a split in the zone since the grade on the west side of the creek, exposed by open-cut, adit and drill holes is only about 2 to 4% zinc while mineralization is also reported in the creek near the upper adit and good float occurs in the creek above this point. A zone in the creek here or, for

that matter, any zone on the east bank, would have been missed completely by all previous exploration. Limestone float on the east side of the creek suggests favorable host rocks on this side.

If it is assumed that the average indicated oxidized grade of say 5.5% across 6 feet is representative and extends over a possible overall length of 1000 to 1200 feet and down to the depth of the lowest drill intersection giving a volume of 6' x 1200' x 220' at 10 cu.ft/ton, the tonnage possibilities are about 150,000 tons of 6% zinc. Drill holes suggest comparable or better grades and widths at shallow depths. However, the zone is completely open to the south or down hill, the width and the grade of the wider landslide area with its high grade float is unknown, and the possibilities of other extensions uphill have not been eliminated, therefore this main showing area can be considered an attractive exploration bet for finding larger tonnage with comparable or better grade. A plunge of about 30° into the hill, the most probable suggested by structural mapping, would be the most favorable for tonnage possibilities. Moreover, the steep dip of the zone favours cheap mining methods necessary in mineralization of this low grade.

I t should also be borne in mind that the above known grades and widths are only indications whereas most of the zone between this main section and the exposure on the highway is covered with overburden and has not been explored.

CONCLUSION

Considering the present indications and the possibilities of enhancing tonnage and grade along the unexplored extent of the two limestone bands as well as in the main showing area, this property with its favorable location and other factors presents an attractive exploration bet for a low grade zinc producer with open tonnage possibilities.

RECOMMENDATIONS

Further exploration should consist of the following:

Stage 1

1. Staking additional claims and arranging right of entry and any options on surface rights with farmers on the lower sections.

2. Examination of the property in more detail, including more detailed geologic mapping, and geochemical surveys of the main showing area, downhill extensions, and the zone on the highway.

3. A minimum of bulldozer trenching to test the upper showing area and other sections of shallow or moderate overburden.

Stage 2

4. Diamond drilling where indicated.

Stage 3

5. Underground exploration and development if justified by size, grade, and frequency of mineralized sections.

Cost of Stage 1

An initial careful expenditure of approximately $10,000 on detailed geologic and geochemical work with follow up bulldozer trenching and sampling should determine the justifiability and extent of additional drilling in stage 2 where a similar or greater amount would be required.

Respectfully submitted,

Dr. A. E. Aho
Consulting Geological Engineer.

ADDITIONAL NOTES (From S.W. Barclay)

1. Drill hole averages only

	14.0'	@	5.6%
	13.5'	@	2.4%
	5.0'	@	14.88%
	28.0'	@	3.20%
	19.0'	@	4.10%
Ave.	16.0'	@	4.5%

2. Previous surface sampling by other engineers (Notes by Barclay)

	6.0'	@	9.0%	)
	8.5'	@	7.0-10.73-5.83-6.13%	) Ave. 8.0%
	6.0'	@	9.0%	)
	5.0'	@	10.0%	)

3. Combined averages of surface and drill holes suggests about 13 feet @ 5%, which would double the 150,000 ton estimate to an average depth of 200 feet.

ACCOMPANYING DATA

1. Logs of diamond drill holes Liz-B no.'s 1 and 2.

2. Assay certificate with values averaged on Aho's sampling.

3. Geologic map of area by Dirk Tempelman-Kluit.

4. Plan and section of main showing area compiled from data by Newmont, Sheep Creek, and Aho.

5. Aerial photographs and air photo enlargement (retained in Aho's files).

6. Nelson E ½ GSC map 603A by H.M.A. Rice (refer to for regional geology and location).

LOG OF

DIAMOND DRILL HOLE NO. LIZ-B NO. 1

N 51 W
- 65 degrees

Started Nov.1, 1961
Completed Dec. 20, 1961
Ultimate depth 365'

	0-93	Casing
	93-110	Thin bedded limey schist
	110-116	Limestone
	116-217	Thin bedded limey schist Minor pyrite and few grains
326 331 ½ 5 ½ Est 5% Zn		sphalerite from 208
	217-221	Limestone
Section sent for assay	221-226	Thin bedded limey schist
by S.W. Barclay	226-236	Limestone
Results .08% Pb 14.88% Zn	236-258	Thin bedded limey schist
	258-267	Hornblende alteration
Evidence of much grinding	267-272	Thin bedded limey schist
	272-279	Dike
	279-292	Silicified limestone
	292-301	Quartzite
	301-310	Thin bedded limey schist
	310-317	Limestone - considerable pyrite
	317-320	Dike
	320-348	Schisty limestone. Sample 326 - 331 ½
	348-350	Quartzite
	350-352	Schisty limestone
	352-353	Quartzite
	353-356	Limestone

LOG OF

DIAMOND DRILL HOLE NO. LIZ-B NO. 2

N 51° W
- 75°

0-73	Mainly Ls. with thin slaty bands (cons. limonitic sections)
73-90	Black slate
90-140	Ls. with brown sections
140-150	Schist
150-157	Ls.
157-160	Quartzite
160-220	Ls. sulfs. at 168 - 169 quartz band 2" wide at start of sulfs. 181 - 195 cons. FeS. much quartz 185 - 195 minor schist beds and cons FeS and qtz 204 - 218
220-225	Black dike

Core dumped on ground
pieces of sulphides picked up and assayed
Ran .08% Pb 23.22% Zn

To

Dr. A. E. Aho,

328 - 355 Burrard Street,

Vancouver, B. C.

Certificate of Assay

COAST ELDRIDGE

ENGINEERS & CHEMISTS LTD.

125 EAST 4TH AVE. VANCOUVER 10 CANADA

FILE NO A.3-A.[illegible]-63 (9170)

DATE November 8th, 1963

We Hereby Certify *that the following are the results of assays made by us upon submitted* Ore *samples*

MARKED	LOCATION	WIDTH	GOLD Ounces per ton	GOLD Value per ton $	SILVER Ounces per ton	SILVER Value per ton $	Lead (Pb) Per cent	Lead (Pb) Value per ton $	Zinc (Zn) Per cent	Zinc (Zn) Value per ton $	Pb+Zn Value per ton $	FT.x%	Total value per ton $
L-1	CUT NO.1	7.0'					0.15		1.10		1.25	8.7	
2	2	8.5' FW					0.09		1.13		1.22		
3	2	6.5' HW					0.05		4.91		4.96	32.3	
4	2(b)	5.0' FW					0.04		1.90		1.94		
5	2(b)	5.0' HW					0.03		4.69		4.72	23.6	
6	3	6.0'					0.03		8.28		8.31	49.9	
8	4	7.5' HW					0.49		6.21		6.70	50.1	
9	5	5.3'					0.09		6.42		6.51	34.5	
11	LANDSLIDE	AVG. MUCK					0.12		1.28		1.40		
12	6	5.0'					0.03		4.34		4.37	21.8	

(No's 7 & 10 NOT ASSAYED)

AVERAGES:

(A) UNWEIGHTED

L-3, 5, 8, 9, 12, (#6 CUT TO AVE %) — 5.9' AVE 5.5%

L-3, 5, 6, 8, 9, 12 — 5.9' AVE 6.0%

L-1, 3 5, 6, 8, 9, 12 — 6.0' AVE 5.2%

(B)

BM

Gold calculated at $ ..... per ounce. *Calculated at ..... cents per lb.*

Silver calculated at $ ..... per ounce. *Calculated at ..... cents per lb.*

Note: Rejects retained one week.
Pulps retained three months.
Pulps and rejects may be stored for a maximum of one year by special arrangement.

H. Sharples

Provincial Assayer