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ELECTROLYTIC ZINC COMPANY OF AUSTRALASIA LIMITED
West Coast Mines

EXPLORATION LICENCE NO. E.L. 4/73 STERLING VALLEY
OPEN FILE

Progress Report on Exploration Activity
25th August, 1982 to 20th November, 1982.

Geology Dept.
Report No. 161 MD

R.A. Sainty,
December, 1982

83-1922

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1. INTRODUCTION

This report covers continuing exploration on E.L. 4/73 by the Electrolytic Zinc Company of Australasia Limited acting as Manager for a Joint Venture consisting of E.Z., Aberfoyle Exploration Pty. Ltd. and Getty Oil Development Co. Ltd., between 25th August and 20th November, 1982.

2. PREVIOUS EXPLORATION

Previous exploration on E.L. 4/73 is detailed in E.Z. reports no's 133 (1980), 143 (1981), 146 (1981), 150 (1982) and 154 (1982).

3. ABBREVIATIONS

Standard symbols and terminology used on geological plans and sections are detailed on Plate 1 of E.Z. report no. 143 "E.L. 4/73 Progress Report on Activity, July, 1980 - June, 1981".

4. EXPLORATION UNDERTAKEN 25TH AUGUST TO 20TH NOVEMBER, 1982 (Refer Figure 1)

4.1. Work Completed

Geochemistry:

The previously assayed samples of vein mineralisation from the costeans on line 3,260N were assayed for Au and Mo.

The long costean (over the Sn/As soil anomalism) was sampled in 2m channel samples to ascertain the bulk grades of Au and Sn and place the high Au spot samples (below) in a better perspective. Thirty seven soil samples along strike were also reanalysed for Au.

Mineragraphy:

Five grey vein samples from the costeans were submitted to C.M.S. for mineragraphic description.

Proposed Rehabilitation:

A letter and plan giving details of the intended rehabilitation of the costeans and drill hole access tracks were sent to the Dept. of Mines in order to ensure that this work will meet with approval. It was suggested that the Dept. may prefer to have the costeans left open because of the possible significance of the new outcrops of granite in them.

4.2. Results Received**Geochemistry:**

The Au and Mo analyses of the costean vein mineralisation were received, and indicate high Au values, 26.6 ppm and 8.62 ppm, of two samples of Sn/As-rich dark sulphide-rich material. Mo contents are low. Results are as follows, with Sn and As values.

Sample No.	Sn (A.A.S.)	Sn (X.R.F.)	As	Au (ppm)	Mo (ppm)
48071	2.30%	1.20%	16.0%	8.62	X
48072	450	541	0.35%	0.04	X (qtz vn with py)
48073	0.48%	0.67%	10.5%	26.6	X
48074	71	86	0.1%	0.18	2.5 (qtz vn with py)
48075	0.75%	1.25%	6.0%	0.33	X
48076	105	161	19.0%	1.19	1.0
48077	22	41	23.0%	1.47	X

The Au assays were by 30g fire assay fusion/AAS technique, Mo by extraction/AAS. The 19.0% As content of 48076 was previously reported at 1.9%, traced as due to a dilution error in analysis.

The channel sample Au and Sn assay results from the costean and the re-assay of soil samples had not been received at the time of reporting.

Mineragraphy: (Refer to Appendix 1 - C.M.S. Report 82/9/12)

Thin and polished section examination of the vein samples confirm a "granitic (quartz-schorn) vein and replacement paragenesis", with the main sulphide phases being arsenopyrite, pyrite, pyritised pyrrhotite, lesser altered chalcopyrite and cassiterite. Au was

not detected. Secondary Fe-free arsenates may partially explain the discrepancy between assay As and Fe.

Proposed Rehabilitation:

The text of a letter (19th November, 1982) received from I.B.Jennings on behalf of the Director of Mines is as follows:

"The rehabilitation measures suggested for track 'A' are satisfactory and will meet the requirements of this Department. In view of the geology exposed on track B it would be appreciated if the rehabilitation was delayed until the Geological Survey staff can inspect and sample the exposures. I will advise you when this has been done."

APPENDIX 1

C.M.S. Report 82/9/12 - Mineragraphic descriptions.

REPORT CMS 82/9/12

Five samples of vein mineralisation were received for mineralogical examination. Representative polished sections were prepared for determination of opaques and three thin-sections were prepared to confirm the non-opaque assemblage.

These rocks reflect a "granitic" (quartz-schorl) vein and replacement paragenesis. Late stress effects are more or less pervasive and grade into granulation and semi-mylonitic deformation. Primary vein features are thus partly obscured, although some of this mineralisation is clearly zoned (or "banded").

The sulphide assemblage comprises mainly arsenopyrite, pyrite and (essentially entirely pyritised) pyrrhotite with subordinate, variably supergene-altered chalcopyrite. Assay Sn appears entirely related to cassiterite. Accessories include galena, sphalerite and tetrahedrite-tennantite. Extremely rare native silver occurs associated with supergene Cu and Cu-Fe sulphides, suggesting chalcopyrite (and/or "tetrahedrite") as the primary argentiferous phase. Gold was not detected and is conceivably in "solution" with Fe-sulphide or arsenopyrite.

Arsenopyrite was confirmed by microhardness and XRD data on sample 48076. The discrepancy between assay As and Fe remains paradoxical in view of the mineralogical observations. Evidently, this is a reflection of sampling, at least in part. Secondary arsenates, however, are semi-ubiquitous, with scorodite grading optically into mansfieldite and with patchy associated arsenolite. Conceivably, the Fe-free phases (mansfieldite, arsenolite) are relatively more abundant than evident in these rocks as sampled and sectioned.

D. Cowan, B. Sc.

REPORT CMS 82/9/12

Mineragraphic/Petrological Descriptions48071

(T.S., P.S. 43566)

This rock consists of semi-banded, fine- to medium-grained vein-type quartz with semi-continuous zones of fine-grained pale green schorl interspersed with zones of quartz-gangued, disseminated to semi-massive sulphide with conspicuous associated cassiterite. The crude banding is on a millimetric scale. The rock includes sporadic ill-defined intraclasts of thoroughly silicified sericitic pelite and reflects marked stress effects grading into semi-nylonitic deformation.

The major sulphide is fine- to medium-grained (max. about 1.5 mm) arsenopyrite, variously granular to subhedral where relatively massive, and relatively euhedral where disseminated and typically enclosed in, or with intergranular quartz. Arsenopyrite exhibits very thinly disseminated inclusions (< 25 μ) of chalcopyrite, galena and pyrrhotite. Relatively minor to rare, sub- to euhedral pyrite (to 250 μ) and patches of "pyritised" pyrrhotite (to 750 μ , pseudomorphed by lamellar aggregates of microcrystalline pyrite, marcasite) are disseminated throughout the disseminated to semi-massive arsenopyrite aggregates, along with interstitial blebs of chalcopyrite, typically marginally replaced by covellite with minor associated digenite.

Cassiterite is partly intergranular, but tends to be concentrated into quartz-rich bands with relatively disseminated sulphide (arsenopyrite, relatively slightly abundant, marginally altered chalcopyrite). Grain-sizing is variable, partly a reflection of granulation, with fine particles (< 10-50 μ) typically angular and interspersed with coarser, sub- to euhedral grains (50-200 μ , mean 100 μ) and granular aggregates.

Extremely rare microscopic (< 20 μ) blebs of sphalerite and tetrahedrite-tennantite complete the sulphide assemblage. Sparse limonitic fractures include discontinuous films of secondary microcolloform mansfieldite.

48073A

(T.S., P.S. 43567)

A quartz-gangued, disseminated to semi-massive "pyritic" ore, this rock is identified in thin-section as a quartz-veined and variably silicified breccia with clasts of sericitic pelite. The bulk of sulphide is associated with irregular to straight-walled zones of stressed vein-quartz including minor accessory green schorl. Patchy secondary scorodite, grading optically into mansfieldite, corrodes pyrite and the accessory arsenopyrite, and there are minor zones of arsenopyrite-replacive, cloudy, cryptocrystalline to microcrystalline ?arsenolite.

Sulphide aggregates are irregularly shaped and distributed. The bulk comprises sub- to millimetric, granular, medium-grained pyrite with interspersed zones of finer-grained to microcrystalline pyrite with subordinate to minor closely intergrown marcasite, forming relatively spongy aggregates which are secondary after pyrrhotite.

Chalcopyrite is relatively conspicuous as discrete quartz-intergranular patches up to 2 mm diameter, extensively replaced by supergene covellite. Minor corroded relics of arsenopyrite are disseminated throughout. Thinly disseminated cassiterite is fine-grained (max. 60 μ) and of quartz-intergranular habit. Rare relics of pyrrhotite are included in quartz. Colloform mansfieldite is relatively conspicuous in the area polished-sectioned where, in addition to pyrite and arsenopyrite, it also corrodes and replaces chalcopyrite and covellite.

48073B

(P.S. 43568)

A relatively supergene-altered and oxidised, disseminated to semi-massive sulphide assemblage consisting largely of pyritised pyrrhotite with subordinate "primary" pyrite, arsenopyrite and (extensively altered) chalcopyrite. Gangue is partly recognisable as clays (?sericite) with relatively minor quartz and rare zones of schorl. The rock is banded and, in common with 48071 and 48073A, reflects stress and brittle deformation effects which postdate the sulphides

Semi-massive bands of microgranular pyrite (with intergrown marcasite, "pyritised" pyrrhotite) include disseminated medium-grained pyrite and arsenopyrite euhedra. These grade into relatively disseminated but texturally similar zones corroded by earthy chalcocite-covellite replacements and then to limonitic pseudomorphs. Supergene altered areas include traces of secondary cubic cubanite as microscopic blebs associated with the (pyrite, arsenopyrite and chalcopyrite-) corrosive earthy Cu-sulphides.

This rock includes disseminated irregular blebs and minor coarser patches (to 150 μ) of tetrahedrite-tennantite, usually discrete, but occasionally intergranular to the pyritised pyrrhotite. This phase is similarly corroded by chalcocite-covellite.

A single bleb (15 μ) of native silver was observed in supergene cubanite, thus suggesting chalcopyrite as a possible locus of Ag (along with tetrahedrite-tennantite). Cassiterite (and stannite) are absent from the area sectioned. Similarly, there is no detectable galena or sphalerite or their altered equivalents.

48075

(P.S. 43569)

Essentially a mineralised breccia with clasts of vein-type quartz and quartz-schorl rock (?altered psammopelite) with a compositionally similar matrix carrying conspicuous arsenopyrite and fine-grained cassiterite. Apart from rare pyrite and pyritised pyrrhotite,

arsenopyrite is the only sulphide in the area sectioned, occurring as sub- to euhedral grains (mean 100 μ) which tend to be clustered into loose clusters and semi-massive films along the margins of clasts. Extensive alteration to a secondary non-opaque (?scorodite-mansfieldite) is evident.

Cassiterite, in contrast, is more or less randomly distributed throughout the rock as a whole as 10-100 μ , mean 30-40 μ diameter rather equant grains embedded in clast and matrix quartz-schorl aggregates.

48076

(T.S., P.S. 43570)

This rock consists of variably stressed and locally weakly granulated, medium-grained vein-type quartz with conspicuous arsenopyrite. Patchy secondary mansfieldite corrodes and replaces arsenopyrite and is locally concentrated into late crosscutting fractures. This phase is locally degraded into semi-isotropic arsenolite.

The sulphide assemblage is relatively simple, with semi-massive clusters of sub- to euhedral arsenopyrite (mean 750 μ) and subordinate to minor intergranular pyritised pyrrhotite. Very minor traces of galena and variably supergene-altered (to chalcocite) chalcopyrite occur as < 50 μ diameter inclusions in arsenopyrite. There is no detectable cassiterite in the area sectioned.

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