

000

953001

70-686

GEOLOGICAL REPORT

for

PK9
6

BAY EXPLORATION PTY.LTD.

E.L.34/70, Tasmania.

MICROFILMED

Prepared by:

A-Z Geological Consultants Pty.Ltd.
Brisbane.

AMG REFERENCE POINTS ADDED

C O N T E N T S

- I. Introduction
 - II. Topography
 - III. General Geology
 - IV. Geochemical Stream Sediment Survey
 - V. Recommendations and Further
Investigations
-

002

I. Introduction

An initial exploration of E.L. Area 34/70 was undertaken in order to:

- (a) Delineate prospective and the unprospective areas.
- (b) Establish the validity and application of geochemical techniques and, if possible to locate anomalous areas.
- (c) Check the accuracy of geological maps published.

The area is situated to the south, north and east of St. Mary's, the principal town of the district, about 120 miles NE of Hobart. The exploration licence has an area of approximately 166 square miles and extends in the north-west to the south Esk River, and in the east to within half a mile of the coast.

Access in the area is good near St. Mary's, but the country to the South and east is rugged with very steep valleys in the region of Elephant Pass. Access therefore is mostly by some tracks trafficable only to 4-wheel drive vehicles and foot traverse. The area in the NW of the licence area which has been investigated, has a dense network of forestry roads of very good standard. Further east, however, to the south of the Scamander River, the country is steep, rugged and moderately heavily timbered, and there are no tracks.

II. Topography

Around St. Mary's the country is of moderate relief, with ridges of Mathinna Beds and rounded granite hills further to the east.

The eastern part of the area rises swiftly from the coastline and peaks of 2,500 ft. are soon reached, with steep sided rapidly eroding streams.

The N.W. part of the area consists of some Mathinna Beds and again the area is of moderate relief, with Permian and Mesozoic capping the hills in places, with the highest peaks possessing a cap of Jurassic dolerite (Mt. Nicholas).

III. General Geology

The oldest rocks in the E.L. area are a series of shales, mudstones, and slightly silicified sandstones of the Mathinna Beds, assigned tentatively to the Siluro-Devonian. Areas of outcrop of Mathinna Beds have been considered as the primary target for exploration, since similar rocks are mineralised to the north of the area with Cu (Or^{ieco} Mine), Sn (Pyramid Mine) and Pb-Zn-Ag (Scamander).

Near St. Mary's the Mathinna Beds consist of slightly metamorphosed grey-green slates and siltstones often with fine banding and fracture cleavage to give the appearance of a "ribbon shale". Some quartzose bands are present. Little

3.

outcrop can be found in situ, and the ridges consist mostly of small boulders and fracture cleaved chips. The soils derived from the Mathinna Beds are clayey, indicating the argillaceous nature of the original sediments.

Several outcrops near St. Mary's show that the regional trend is NNW - SSE with the beds having very steep dips.

The Mathinna Beds in the NW of the area near the South Esk River, again have a NNW - SSE trend and are very well fracture cleaved. Outcrop tends to be poor, the hills being covered with small fracture cleaved chips of the slates.

No surface mineralisation was noted in the beds. Some ironstaining is present in places. No prominent quartz veins, lodges or gossans were observed,

Devonian-Carboniferous plutonic intrusions (the St. Mary's Adamellite Porphyry and the Picaninny Point Adamellite) followed the deposition of the Mathinna Beds.

The St. Mary's Adamellite Porphyry is a blue-grey, dense, compact rock which has been reported as a biotite-hypersthene adamellite porphyry. It is variable in grain-size and texture. No extensive or marked contact zones or metamorphic aureoles occur where the Porphyry intrudes the Mathinna Beds.

4.

The Picaninny Point adamellite is a small intrusion in the south of the E.L. area, and intrudes the St. Mary's Porphyry. It is reported to be similar to the Coast Range monzonite to the north, near Scamander and St. Helens. The contact between the Mathinna Beds and this intrusion can be traced along the Tasman Highway, near Elephant Pass. The contact metamorphic aureole is not well developed, and no quartz veining or mineralisation could be noted within the Mathinna Beds. The main effect of the intrusion has been mechanical - the cleavage and fracturing of the Mathinna Beds becomes much more intense near the contact.

Because of the steep topography and rapid erosion, exposure of both adamellites is quite good, and soils are not extensively developed.

Overlying all the Palaeozoic rocks are the Permian sediments, which are coal-bearing in the E.L. Area, and consist of a series of sandstones with minor shales and some fine conglomerates. In the N.W. of the E.L. Area, extensive areas of Permian are developed on higher ground, possessing horizontal bedding and lying unconformably on the Mathinna Beds. The beds are predominantly grey banded compact sandstones to sub-greywackes.

At the top of the Permian sequence, in the N.W. of the E.L. Area basal Triassic conglomerates and grits are developed. These conglomerates are quartzose, and possess

007

pebbles of the Permian beds beneath. In many areas, however, it has not proved possible to unambiguously separate Permian from Triassic beds. Soils overlying the Permian and Mesozoic are sandy and quartzose.

In several areas Jurassic dolerite overlies the Triassic sandstones and these are generally the areas of the highest altitude. They possess deep soil profiles.

Mapping of the N-Western part of the E.L. indicates that much of the area is covered by Permian, Triassic and Jurassic rocks, which is in contrast to the various published maps which show that the area is totally covered by the Mathinna Beds. It would appear that published geological maps of this area need revision.

Ref. D. G. Jones mapping

IV. Geochemical Stream Sediment Survey

An initial stream sediment sampling program was undertaken to evaluate the most prospective parts of the area. A total of some 68 stream sediment samples was collected and the -80 mesh fractions were subjected initially to analysis for Cu, Zn, Ag and As. Selective anomalous samples were further analysed for Sb, Pb, Cd, and Sn. It then appeared that the Sb values were extremely high and the whole batch of collected samples was then submitted for Sb analysis.

TABLE I

Distribution of Cu Values in the
Stream Sediment Samples

	Cu(ppm) Mean	No. of samples	Level above which Cu(ppm) is anomalous	Cu anomalies
<u>Picaninny adamellite</u>	17	5	34	0
<u>St. Mary's Porphyry</u>	14	19	28	<u>SM60</u> 50 ppm <u>SM52</u> 70 ppm
<u>Mathinna Group</u> (near St. Mary's)	15	20	30	<u>SM11</u> 40 ppm
<u>Mathinna Group</u> (NW area)	18	24	36	(<u>SM44</u> 35 ppm) <u>SM43</u> 45 ppm <u>SM38</u> 40 ppm)

Average Cu Mean (68 samples) is
16 ppm. Cu

DISCUSSION RESULTSArsenic

All collected samples analysed < 30 ppm. As, and the values of As in the stream sediments are therefore not indicative of mineralisation. Values of > 50 ppm. As can generally be considered anomalous in stream sediment samples, but it is possible that in iron rich environments most of the As becomes immobile and its value as an indicator of mineralisation is then useless. The Sb - As association can be indicative of Au mineralisation, but the low As levels appear to exclude this type of ore occurrence.

Silver

All collected samples analysed < 3 ppm. Ag, and none of these values can be considered to be significant as an indicator of mineralisation. Values of > 3 ppm. Ag can usually be considered anomalous.

Copper

In Table I the interpretation of the Copper analysis is presented. The overall mean value of copper is 17 ppm. Examination of the Cu values for the four different areas examined shows that no anomalies are associated with the

TABLE II

Distribution of Zn Values in the
Stream Sediment Samples

	Zn(ppm) Mean	No. of Samples	Level above which Zn(ppm) is anomalous	Zn anomalies
<u>Picaninny</u> <u>Adamellite</u>	43	5	86	0
<u>St. Mary's</u> <u>Porphyry</u>	45	19	90	<u>SM60</u> 145 ppm
<u>Mathinna</u> <u>Group</u> (near St. Mary's)	47	20	84	<u>SM2</u> 90 ppm <u>SM4</u> 89 ppm <u>SM11</u> 170 ppm
<u>Mathinna</u> <u>Group</u> (NW area)	57	24	114	<u>SM24</u> 200 ppm <u>SM38</u> 230 ppm

Average Zn Mean (68 samples) is

49 ppm. Zn

011

Picanninny Point adamellite. Two anomalous drainage cells are outlined within the St. Mary's Porphyry area, the samples analysing 50 ppm. and 70 ppm. Cu respectively.

One Cu anomaly was outlined in the Mathinna Group sediments near St. Mary's, and two anomalous drainage cells were detected in the NW area of Mathinna Group sediments. The magnitude of all the Cu anomalies is small, that is the Cu values are low. But within the sampling population they are significant, and will require follow-up work.

Zinc.

In Table II the interpretation of the Zn analysis is shown. The overall zinc mean is 49 ppm. No anomalies occur in samples collected from the Picanninny Point adamellite. One anomaly occurs within the St. Mary's porphyry (SM 60, 145 ppm. Zn) and this anomalous cell coincides with the anomalous copper drainage cell. Five anomalous cells occur associated with the Mathinna Group sediments. Several of these anomalies again coincide with Cu anomalies, supporting the anomalous character of these drainage cells.

Pb, Cd, and Sn

All of the samples with high Cu and/or Zn content were also analysed for Pb, Cd, and Sn. In all but two cases,

TABLE III

Distribution of Sb Values in the
Stream Sediment Samples

	Sb(ppm) Mean	No. of Samples	Level above which Sb is anomalous	Sb anomalies
<u>Picaninny</u> <u>Adamellite</u>	62	5	93	0
<u>St. Mary's</u> <u>Porphyry</u>	75	19	125	<u>SM60</u> 145 ppm <u>SM64</u> 130 ppm
<u>Mathinna</u> <u>Group</u> (near St. Mary's)	51	20	76	<u>SM11</u> 100 ppm <u>SM13</u> 90 ppm
<u>Mathinna</u> <u>Group</u> (NW area)	54	24	81	<u>SM24</u> 167 ppm <u>SM31</u> 100 ppm <u>SM32</u> 86 ppm

Average Sb Mean (68 samples) is

60 ppm. Sb

013

Cd was < 1 ppm. For samples 60 and 64, Cd analysed 1 ppm, and sample SM 60 contained 145 ppm. Zn. Cd and Zn are almost invariably associated but the Zn nobility is much greater. However, it serves to illustrate that a possible Zn mineralisation could exist.

No significant information could be obtained from either the Pb or Sn analysis.

Antimony

The interpretation of the results of this element must remain somewhat in doubt as the overall levels of the Sb content of the stream sediment samples are extremely high and in itself could be considered anomalous. The high Sb content was first noticed when analysing the Cu-Zn anomalous samples for additional elements. Before proceeding with the Sb analysis of all the samples, procedures in the laboratory were checked, and two assays were performed. The assays confirmed the high Sb content analysing 200 ppm. Sb respectively (geochem. extraction 125 ppm.). However, an analytical error cannot at all be ruled out at this stage, and several samples have been submitted to another laboratory to confirm the values so far obtained. Until the results of these independent check assays are on hand, not too much importance should be attached to the results obtained so far.

Common Sb values in igneous rocks of all descriptions are < 1 ppm; in sedimentary rocks Sb values are usually somewhat higher (but seldom exceed 5 - 6 ppm). Sb content of galena, sphalerite and pyrite can be quite high values of up to 10,000 ppm. being recorded. When however the rocks are mineralised the Sb values can be considerably higher. (Mansfield copper shale 300 ppm. Sb). Sb values of up to 125 ppm. have been reported from stream sediment in Alaska, and soils close to Sb deposits contain Sb in the range of 60 - 3,000 ppm. Sb.

In Table III the interpretation of the Sb data is presented. The mean Sb content is 60 ppm. No anomalies are associated with the Picaninny adamellite, two anomalies are associated with the St. Mary's Porphyry, one anomalous cell of which also constitutes a Cu and Zn anomaly; and five anomalous cells are associated with the Mathinna group sediments, three of which also constitute Cu and/or Zn anomalies.

Conclusions

At least 12 anomalous drainage cells have been located on which further geochemical work is warranted. The Sb values (if proven to be correct) are highly anomalous and these would require a very detailed investigation. The Picaninny Point adamellite appears to be devoid of anomalous

015

sediment.

V. Recommendations and Further Investigations

It is recommended that the area shown on the accompanying map, west of the township of St. Mary's, be relinquished, and that the remainder of the area be retained and be subjected to a more exhaustive and detailed geochemical survey. At this stage the most prospective area has not yet been investigated. Results so far obtained appear encouraging to warrant a further follow-up program in the areas examined.

A ridge sampling, base of slope, and stream sediment coverage program is recommended in the investigated areas, and the unexplored area.

After more precise delineation of anomalous areas, a soil sampling program to establish drilling targets is recommended.

Brisbane 26.12.1970

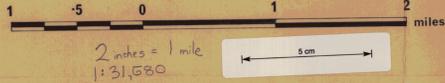


M.J. Abbott, B.Sc., Ph.D.

for

A-Z Geological Consultants Pty. Ltd.

GEOCHEMICAL and GEOLOGICAL MAP OF
E.L. 34/70 Tasmania



- | | | |
|--------------------------|--|---|
| JURASSIC | | Dolerite |
| PERMIAN - TRIASSIC | | Horizontal Greywackes, Sandstones and Conglomerates |
| DEVONIAN - CARBONIFEROUS | | St. Mary's Adamellite Porphyry |
| | | Piccaniny Point Adamellite |
| ORDOVICIAN - SILURIAN | | Slates and Silicified Shales (Mathinna Beds) |

- GEOLOGICAL BOUNDARIES
- accurate
 - inferred

- SPECIMEN SAMPLES
- stream parts per million
 - soil

Screen so linear data base numbers 2701 - 2768

A-Z Geological Consultants
Pty. Ltd.

This map overlies parish maps
CORNWALL - 1c & 2a

Geological Interpretation by
Dr. M. Abbott Phd.

AMG REFERENCE POINTS ADDED

PERMIAN MATHINNA BEDS
(Not yet investigated)

E.L. 34/70

UNPROSPECTIVE
AREA

Recommended to be relinquished.

E.L. 34/70

E.L. 34/70