

ELECTROLYTIC ZINC COMPANY OF AUSTRALASIA LIMITED
WEST COAST DEPARTMENT

PRELIMINARY REPORT ON
ABERFOYLE MINERAL AREA
AVOCA - N.E. TASMANIA - SPL 333

By
Dr B Scott

April 1959

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AMG REFERENCE POINTS ADDED

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| A1. MINERALISATION | 1" = 4 miles |
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ELECTROLYTIC ZINC COMPANY OF AUSTRALASIA LIMITED
West Coast Department

MEMORANDUM:

SUPERINTENDENT

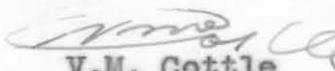
Preliminary Report on Aberfoyle
Mineral Area

Attached please find a report on the above in which Dr. Scott has collected together all the available information on the Aberfoyle-Storey's Creek area.

The information came largely from the mapping of Mines Department geologists past and present and has been taken from Mines Department records.

The main area of interest lies between the two operating Mines in the area, Aberfoyle and Storey's Creek and although the surface has been well prospected it is hoped that the airborne geophysical survey may provide some basis for further investigations.

The nature of the mineralisation (tin and tungsten in quartzose gangue) is such that it is unlikely that the geophysics will reveal mineralisation directly, but it may reveal structures which would be worthy of further investigation.


V.M. Cottle
CHIEF GEOLOGIST.

ROSEBERY, 28th April, 1959

ELECTROLYTIC ZINC COMPANY OF AUSTRALASIA LIMITED

West Coast Department

Rosebery.

21st October, 1958.

MEMORANDUM TO: CHIEF GEOLOGIST

PRELIMINARY REPORT ON ABERFOYLE MINERAL AREA

Attached is a preliminary report on the Aberfoyle Mineral Area in our S.P.L. 333 in north-east Tasmania. It begins with a "Conclusions and Recommendations" Section which is then followed by the main body of the Report. The report is primarily a digest of previous work on this area.

BS/BMS



Asst. Chief Geologist

Distribution: Managing Director
Superintendent
File (2)

PRELIMINARY REPORT ON ABERFOYLE MINERAL AREA

CONCLUSIONS AND RECOMMENDATIONS

- A. The possibility of locating suitably large tonnages of tin/tungsten ore within the granite is considered to be exceedingly remote.

- B. The granite/Mathinna Group contact area forms a zone worthy of further investigation. This area contains the two operating mines at Aberfoyle and Storey's Creek which, over the period 1932 to 1956, have a recorded production of 862,440 tons of ore which contained 16,440 tons of cassiterite/wolfram concentrates. A zone of special interest consisting of approximately 1 square mile between these two mines has been outlined. In this area, and the continuation of the granite contact to the south of the Aberfoyle Mine, the results of the airborne geophysical survey should be extremely useful, as already indicated on page 8, in that they could:
 - i. Assist in the outlining of zones of faulting beneath a recent soil/sedimentary cover.
 - ii. Assist in demonstrating the presence or absence of a sub-outcrop of a granite cupola.

These results are not yet available (October 22nd) and as a consequence the planning of suitable field work must wait.

PRELIMINARY REPORT ON ABERFOYLE MINERAL AREA

1. LOCATION AND ACCESS

This area of mineralisation is situated approximately 14 miles by road to the north of Avoca in S.P.L. 333, and at an altitude of about 2,000 feet above sea level. (Plate A1).

Access to the area is by road from Avoca or Fingal to Rossarden and Storey's Creek. From these two centres the area is crossed by cart tracks to various prospects and logging camps. The country is fairly heavily timbered and, in places, progress on foot is hampered by undergrowth.

The towns of Rossarden and Storey's Creek are situated on the exposed remnants of the pre-Permian peneplain at a height of 2,200 feet above sea level. However, the streams in the area flow in deeply incised, V-shaped valleys indicating continuing active erosion. To the south, the area falls away steeply to the valley of the South Esk River.

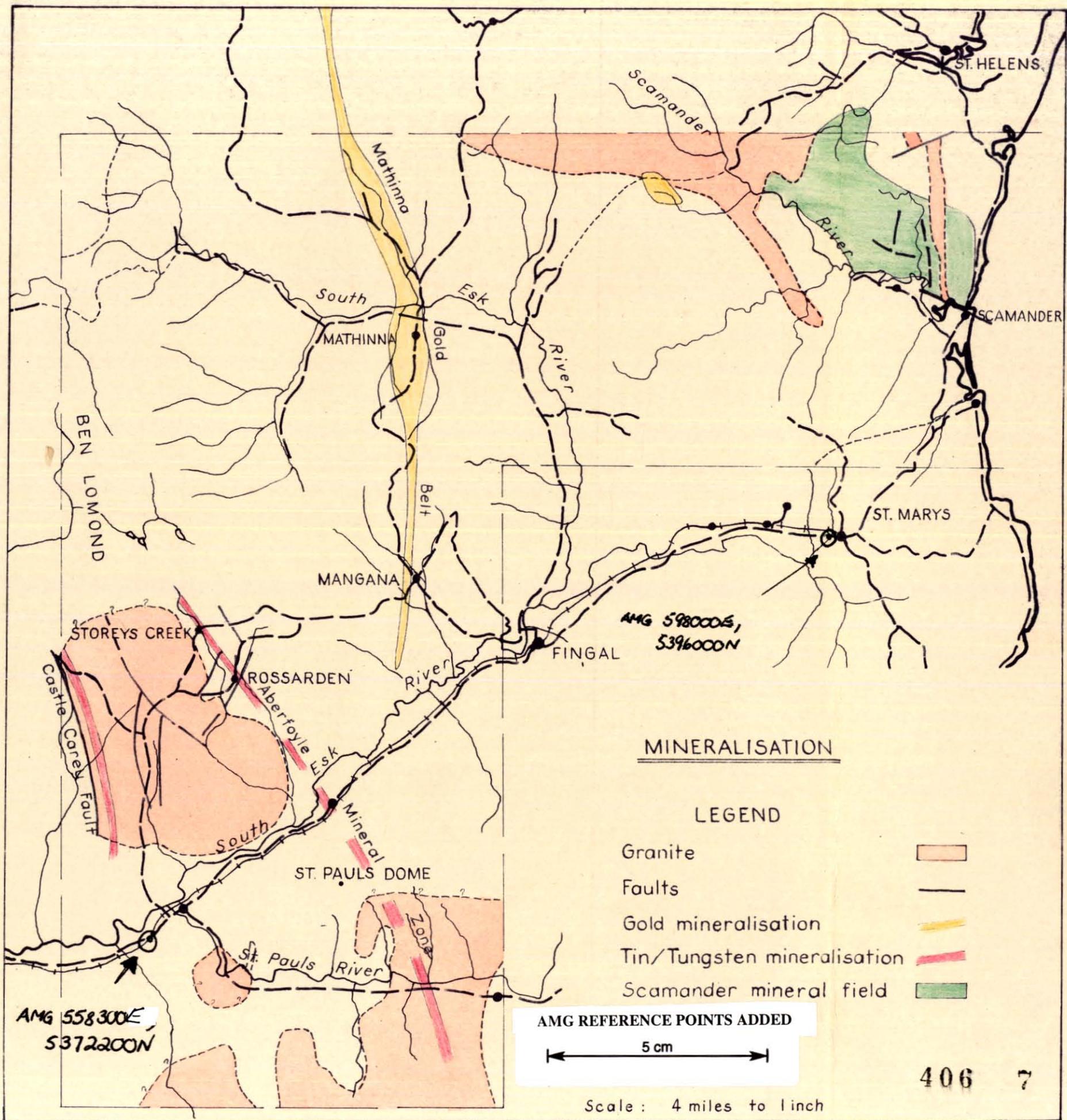
2. GEOLOGY

A. Stratigraphy

A generalised geological map and stratigraphic column are given on Plate A3.

The oldest rocks in the area are slates, orthoquartzites and subgreywackes of the Mathinna Group of approximately Silurian age. Lyons and Edwards (1956a) state that these sediments are tightly folded about axes which trend 135 degrees and dip to the south west at a steep angle (i.e. the folds are overturned to the north east). This is in accordance with observations on this Group made by other workers in the area.

Intruded into the Mathinna Group are Devonian granites which are assumed to be the source of the mineralisation. Associated with the granite are various differentiated derivatives such as pegmatite and aplite, and alteration products, such as greisen which occurs as veins and pipes particularly at the Mathinna Group/granite contact. These alteration products frequently carry cassiterite and as a result descriptions of them have featured prominently in the early reports such as that of Waller (1901)

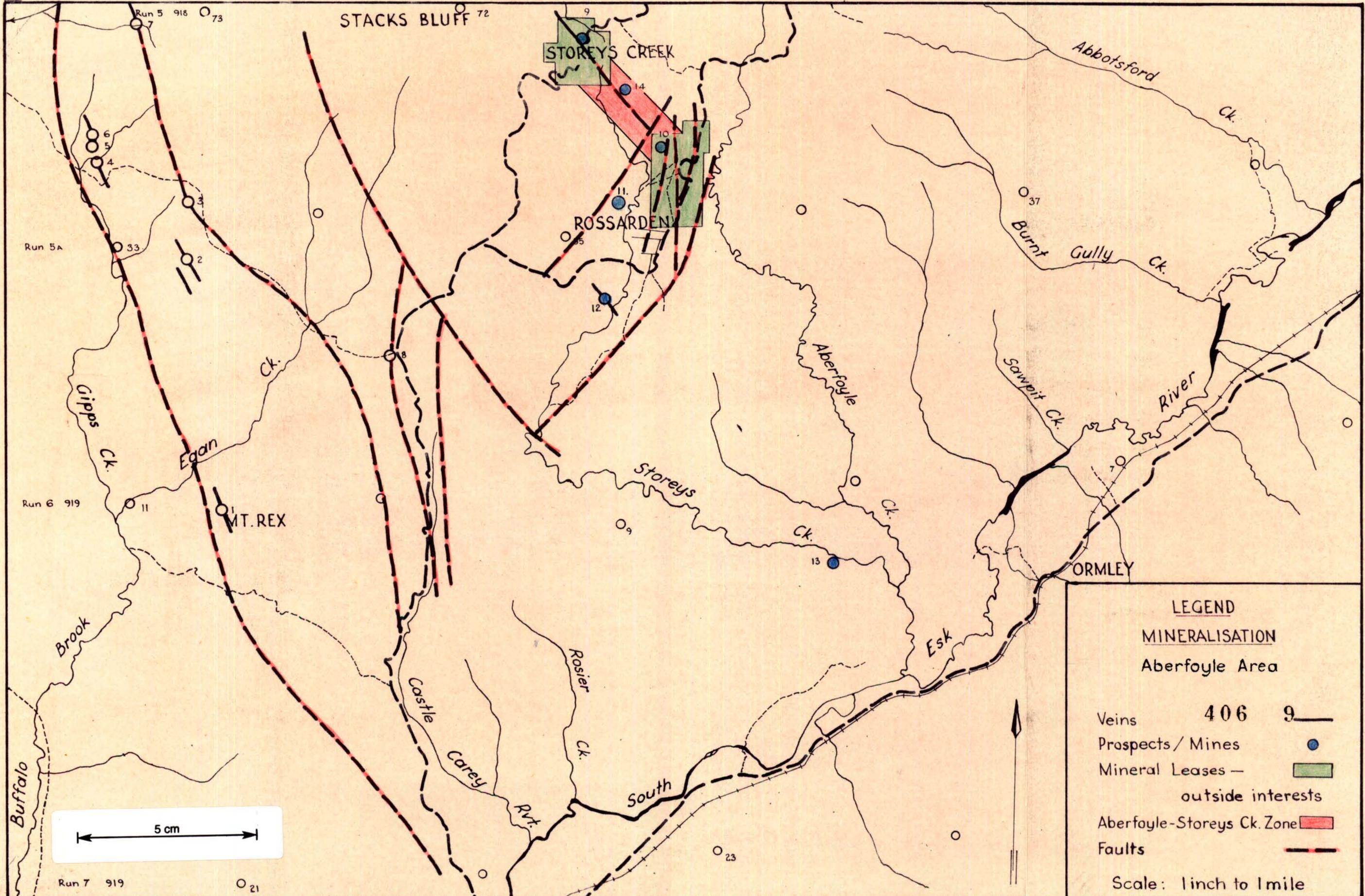


MINERALISATION - ABERFOYLE AREA

9. Storey's Creek Mine
10. Aberfoyle Mine.
11. H.E. Brocks Prospect.
12. Ivanhoe Prospect.
13. Stops Prospect.
14. Aberfoyle - Storey's Creek Zone.

The numbers refer to the numbered prospects on plate
A2, opposite.

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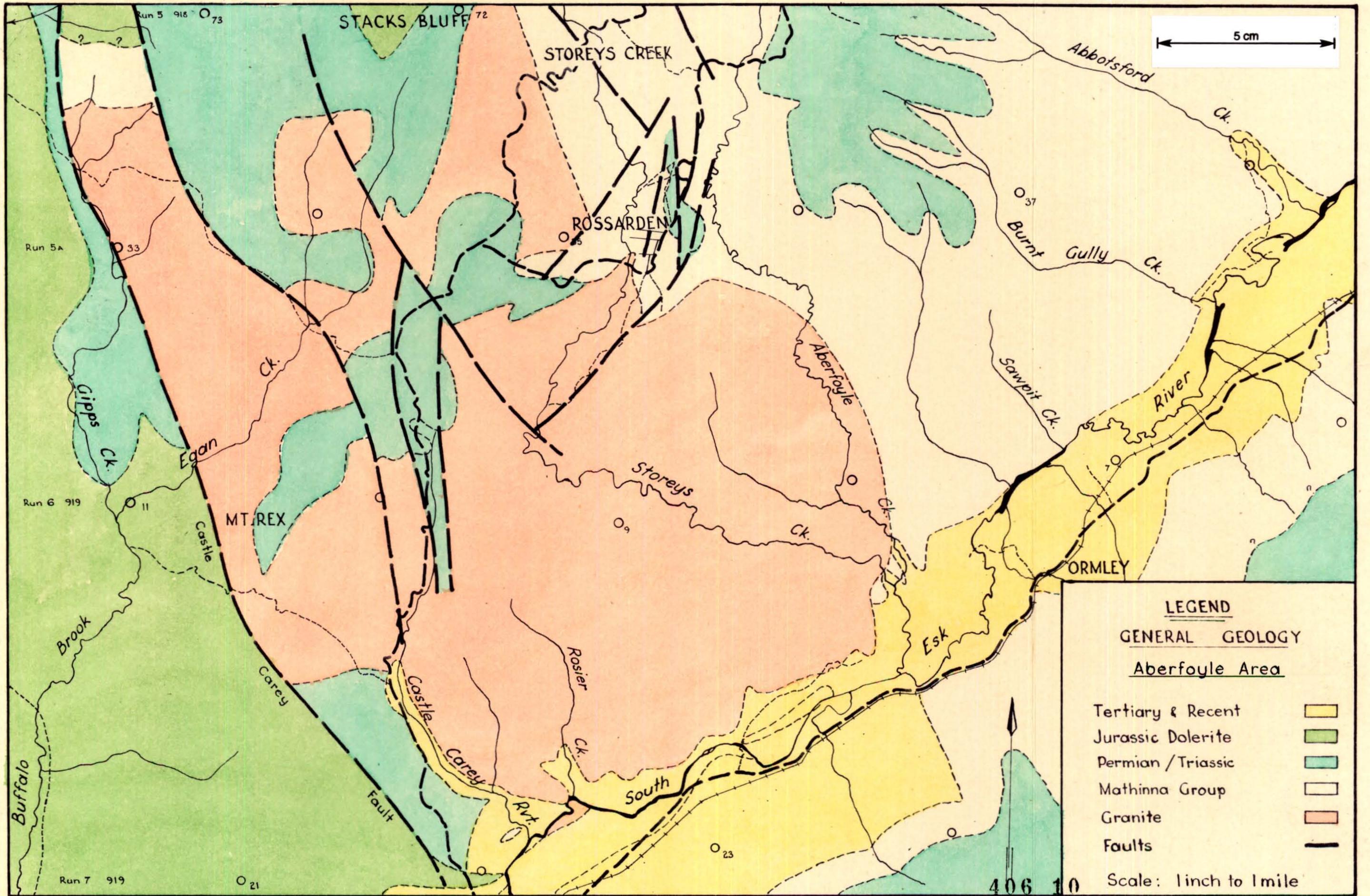
LEGEND

MINERALISATION

Aberfoyle Area

Veins	406	9
Prospects/ Mines		●
Mineral Leases	—	■
		outside interests
Aberfoyle-Storeys Ck. Zone		■
Faults		— — —

Scale: 1 inch to 1 mile



Unconformably overlying both the Mathinna Group and the granite are Permian orthoquartzites, conglomerates, mudstones and occasional limestones. In this area, their maximum thickness, according to H. Blissett has been reduced by erosion to not greater than 60 feet.

The Jurassic dolerite is not exposed in the area proper but occurs immediately to the north as talus derived from Ben Lomond.

Tertiary and Recent alluvials are found in a few small areas in the stream valleys but are of little importance.

B. Structure

a. Faulting

Faulting in the area trends in three directions, 020° , 140° and 170° . The 170° direction in the Rossarden area appears to curve to the south to become the 020° direction. The two main faults in this set, the Burns Marsh and Aberfoyle No. 3 form a graben within which the mine and townsite of Rossarden are placed. Recent mapping by H. Blissett of the Department of Mines suggests a southerly extension of this graben, to the south of Storey's Creek (river) along the Castle Carey Rivulet.

The 140° direction offsets the previous trends and forms the mineralised veins at Storey's Creek Mine and has some influence on the mineralisation within the 170° set at the Aberfoyle Mine.

b. Folding

As in other localities folding is restricted to rocks of the Mathinna Group which Lyons and Edwards (1956) state is tightly folded about N.W. trending axes which form an anticlinorium. The fold axial planes dip at about 80 degrees to the south west with the result that the folds are asymmetrical, with the steeper limb on the north eastern side.

3. MINERALISATION

The mineralisation of the area consists primarily of tin/tungsten, as cassiterite/wolfram. However, minor quantities of lead and zinc mineralisation are known but they appear to be of no economic significance.

The Aberfoyle Mine is the only location where a recent and a

detailed study of the mineralisation has been carried out (Lyons and Edwards 1956 a and b). Here, it was concluded that the cassiterite mineralisation was localised by a definite structural and lithological pattern. The Storey's Creek wolfram mine has been the only other significant producer in the area.

A. Storey's Creek Mine (No.9 on plate A2).

a. Location

The mine is located some 14 miles to the north of Avoca on the lower slopes of Ben Lomond. The area is covered by mining leases 27M/46, 399M and 19M/57 held by the Storey's Creek Tin Mining Company, N.L.

b. History

The mining area was originally held by the Storey's Creek Tin Mining Company which ceased operations in 1892. The area laid dormant until 1913 when the Storey's Creek Tin Mining Syndicate leased the area and raised as much as 12,000 tons of ore per year but in 1928 the mine was again abandoned. In 1937 the present lessors, the Storey's Creek Tin Mining Company N.L., took over the property and have successfully worked it until August of this year when the Aberfoyle Tin N.L. gained control of this Company.

c. Mineralisation

The mineralisation occurs in folded slates and orthoquartzites of the Mathinna Group which have a regional north west strike. The Mine is approximately 1 mile to the north east of the granite/sedimentary contact.

Two veins are being worked, the No. 1 which strikes 350 degrees and the No. 2 which trends 335 degrees. Both veins dip to the west, No.1 at an average dip of 20 degrees and No. 2 at an average dip of 37 degrees. The two veins, which are 130 feet apart at adit level intersect at No. 3 Level, 230 feet below surface. The veins are usually 4 to 5 feet in width but at their point of intersection the total width is reported to be 18 feet. Their intersection then forms an ore pipe which would be pitching to the north at a low angle. The No. 1 Vein has been traced for 450 feet at the surface and 420 feet in the underground workings with a branch vein, No. 1A, continuing at outcrop for a further 1200 feet. The No. 2 Vein has been traced at the surface for 2,000 feet and has been driven on for 2,300 feet. The mine has been developed to No. 5 level, 400 feet below the surface.

Small east-west pug filled faults displace the main veins a few feet but insufficient distance to interfere with mining operations.

Wolfram is the chief ore mineral, together with some cassiterite. The ratio of the two, as recovered, was originally 7:1 but the relative proportion of cassiterite has increased with depth, so that the ratio now approaches 6:1. Both minerals occur in blebs and patches in a gangue of quartz/carbonate. Minor quantities of sulphide are associated and consist of iron, lead and zinc sulphides and the tin sulphide stannite. The average grade of the vein material is approximately 2% total wolfram and cassiterite.

Production records are incomplete and in addition there has been confusion over figures in that in the past the terms "tin concentrate", "cassiterite", "tin" and "metal" appear to have been used synonymously. Similar usage has applied to "wolfram concentrate" etc. The mine was worked as far back as 1890 and during the period 1913-1928, when it was worked by the Storey's Creek Tin Mining Syndicate, production reached as much as 12,000 tons per year of ore of average grade 0.75 to 1.75% tin oxide and 0.75 to 2% wolfram. (Edwards 1953). Consistent figures appear after 1932 and to 1956 248,100 tons of ore were mined for a return of 4017 tons of wolfram concentrate and 910 tons of tin concentrate. * The average grade, based on these figures, is 1.65% wolfram concentrate and 0.37% cassiterite concentrate.

B. Aberfoyle Tin Mine (10)

a. Location

The mine is located at Rossarden, 14 miles by road to the north of Avoca and 2 miles to the south east of the mine at Storey's Creek. The area is held under leases 26M/51, 70M/47, 55M/57, 56M/57, 11013M, and 11564M by the Aberfoyle Tin N.L.

b. History

The veins were first discovered in 1916. Production began in 1932 under the present Company and operations have continued to the present day. Since 1932 to 30th June, 1956, dividends amounting to £2,371,942. have been paid.

* Wolfram concentrate calculated at 72% tungstic acid content.
Tin " " " " " 70% cassiterite content.

c. Mineralisation

The mineralisation occurs in folded slates and orthoquartzites of the Mathinna Group which have a regional N.W. strike. The axial planes of the folds are vertical and the limbs dip steeply. These sediments have been intruded by the granite of Devonian age which at the surface occurs approximately 1 mile to the west of the mine and in the mine workings on the No. 10 Level, which is 1100 feet below the surface.

The mineralisation tends to be confined to patches in the veins and consists of cassiterite and wolfram, with metallic sulphides notably pyrite, arsenopyrite, chalcopyrite, sphalerite and stannite. In treating the ore, the sulphides are removed by flotation and this rejected portion amounts to about 3.5% of the mill feed. The proportion of wolfram to cassiterite has increased from about 1 : 7 in the upper levels to 1 : 6 on the No. 6 Level (600 feet below surface), and it is continuing to increase with depth. This feature is reflected in the annual production figures which have a WO₃:Sn ratio of approximately 1 : 12 in 1933 and gradually decreases to approximately 1 : 2 in 1955, as the emphasis of mining has moved from 100 to 1000 feet below the surface.

In a broader outline the deposit consists of a sheeted zone up to 200 feet wide of parallel quartz veins (Aberfoyle No. 1 Fault Zone) which trend north to south and dip 55 degrees to the west. The outline of the stopes demonstrates that the individual orebodies pitch to the south. Veins down to 10 inches are stoped, and on each level there are 2 to 4 mineable veins, with an average length of 1000 feet, and an average width of 20 inches (A.B. Edwards, 1953). The mineralisation within this shear zone continues downward until level with the granite intrusive (No. 11 - 12 Level) and, according to Robinson (1956), only barren quartz veins continue lower.

The main controls of mineralisation in the mine appear to be the association of four factors.

i. The Aberfoyle No. 1 Fault Zone

This is the zone which determines the north-south strike of the mineralised veins.

ii. The presence of brittle orthoquartzites of the Mathinna Group which on faulting and folding have tended to form openings along the fissures in contrast to the closed "tight" fissures which tend to occur in the associated slates.

iii. The cross faulting which trends north west and generally displaces the veins with a right handed movement of a few inches to 20 feet. Where dislocated the veins become wider and richer. This cross faulting appears to form a fault zone which extends to the Storey's Creek Mine, 2 miles to the north west.

iv. The veins are spatially associated with a cupola of granite which has been located in the lower mine workings and only approaches to within 1050 feet of the surface. This cupola does not appear at the surface. As the veins extend down towards the granite they show a general decrease in dip from 65° to 55°.

d. Production

Production over the period 1933 to 1956 has been 614,340 tons of ore producing 9,489 tons of tin concentrate, 2,023 tons of wolfram concentrate and 694 tons of iron sulphide concentrate. The average grade on these figures is 1.54% cassiterite concentrate and 0.33% wolfram concentrate.

C. H.E. Brocks Prospect (11)

a. Location

The prospect is located on Tasmania Creek about three quarters of a mile west south west of the Aberfoyle Mine. It can be reached on foot from the Avoca - Rossarden Road.

b. Mineralisation

The cassiterite mineralisation occurs in narrow veinlets (measured in inches) in folded slates and orthoquartzites of the Mathinna Group. The trend of the veinlets (320°) follows the bedding trend and pre-mineral fracturing. Several small shafts have been sunk on these shows, the deepest to 54 feet where the vein was two inches in width. In 1951 the Department of Mines drilled one hole 200 feet in length to intersect the mineralisation at approximately 140 feet below the surface but no tin values were met. It appears then that the cassiterite occurs in a series of small veins which are impersistent in depth and length.

A production of 8 tons of "tin" (presumably cassiterite ?) is recorded over the period 1939 - 1941.

D. Ivanhoe Prospect (12)

a. Location

The prospect is situated $1\frac{1}{2}$ miles to the south west of Rossarden and it can be reached by a cart road which leaves the Avoca-Rossarden road on its south side, near the Storey's Creek bridge.

b. Mineralisation

The mineralisation is located in a fine grained granite dyke which intrudes the main mass of coarse grained granite. This dyke trends 315° and is approximately 100 feet wide. It has been traced along its strike to the south for at least 500 feet towards Storey's Creek (river). To the north the dyke passes under the Permian cover. Narrow greisen veins which contain cassiterite occur in the dyke and they localised zones of alteration. One such zone has been worked over a width of 30 feet, to a depth of 6 to 8 feet and exposed over a strike length of at least 300 feet. Three 10 ft. channel samples were taken across this zone by Q.J. Henderson in 1937 and they averaged 0.02% tin. A separate greisen vein 3' 6" wide was sampled and this averaged 0.54% tin.

E. Stops Lead Prospect (13)

a. Location

This prospect is located on the west side of Storey's Creek approximately three quarters of a mile upstream from its junction with Aberfoyle Creek.

b. Mineralisation

This prospect was brought to the notice of the Electrolytic Zinc Company of Australasia Limited by Mr. Peter Stops, of Hobart, who claimed to have been informed of the existence of a large hill of low grade lead-zinc ore in the general area described above. This area was visited by Messrs. Hall and Cottle in the company of Mr. Stops on the 10th December, 1949 and their findings are in report number 23, January 1950.

The only rock seen in situ during this visit was the granite which contained black tourmaline as sporadic clots and occasionally veinlets $\frac{1}{8}$ " or less in thickness. Greisen associated with this tourmaline assayed 0.3% tin. These observations led to the conclusion that the section of granite examined is quite some distance from the margin of the stock and is a place in which it is most unlikely that extensive mineralisation of any type would be found.

F. Aberfoyle - Storey's Creek Zone (14)

a. Location

This zone forms a strip between the Aberfoyle and Storey's Creek Mine 2 miles in length (north/west - south/east) and approximately one mile in width. It lies about 1 mile to the east of the granite/sedimentary contact.

The north and south ends are held under lease by the Storey's Creek Tin Mining Company N.L. and the Aberfoyle Tin N.L. respectively. Between these two mines there is a gap of approximately 1 mile.

b. Mineralisation

The zone outlined above is a well favoured one for tin/tungsten mineralisation since it includes the extensions and possible repetitions of the factors which have localised ore at two operating mines. These factors are: (also page 5)

- i. The north west trending faults.
- ii. The north east trending faults.
- iii. The folded orthoquartzites of the Mathinna Group.

The possibilities of this zone have been appreciated in the past and there have been many small, shallow pits dug on the numerous quartz veins which crop out. However, a considerable portion of the zone is masked by a soil/Tertiary gravel cover and consequently the area cannot have been thoroughly tested. The results of the airborne geophysical survey, particularly the magnetic, may offer considerable help in that not only could they outline zones of faulting beneath the recent cover but they could also demonstrate the presence or absence of a granite cupola, which is considered to be the fourth factor localising the mineralisation of the Aberfoyle Mine. It will be remembered that the cupola at this mine only approached to within 1050 feet of the surface.

CONCLUSIONS AND RECOMMENDATIONS

These have already been outlined at the beginning of the report.

October, 1958.

BS/BMS


Asst. Chief Geologist

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