

ELECTROLYTIC ZINC COMPANY OF AUSTRALASIA LIMITED
WEST COAST DEPARTMENT

FIRST REPORT ON
ROYAL GEORGE – TIN – SPL 333

By
B Scott

November 1958

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AMG REFERENCE POINTS ADDED

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ELECTROLYTIC ZINC COMPANY OF AUSTRALASIA LIMITED
West Coast Department

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MEMORANDUM:

SUPERINTENDENT

ROYAL GEORGE MINERALISED AREA - TIN
(Fingal 605)

Submitted herewith is a Report on the Royal George Tin Mineralisation by Dr. B. Scott who has summarized all the known information on the area.

In view of the statements made by Dr. J.A. Dunn, (Chief Mineral Economist, Bureau of Mineral Resources) in the November and December, 1957 and January 1958 issues of "Chemical Engineering and Mining Review" it may be advantageous for the Company to take an interest in Tin production.

If this suggestion is acceptable it is recommended that Dr. Scott and I make a preliminary field inspection of the three favoured prospects to determine the amount of testing which would be justified.

A copy of the report has been prepared for the Managing Director.


CHIEF GEOLOGIST

Rosebery, 25th November, 1958

Supt. (4)
Geol. (2)

ELECTROLYTIC ZINC COMPANY OF AUSTRALASIA LIMITED

West Coast Department

Rosebery.

Memorandum:

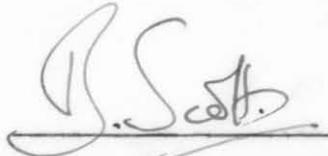
9th October, 1958.

Chief Geologist.

Attached is a preliminary report on the Royal George mineralised area, N.W. Tasmania, which is within our Special Prospecting Licence 333. The report is a summary of published and unpublished information.

The area is one of tin mineralisation which occurs as cassiterite in veins within a granite host. Three prospects/mines are considered to be worthy of further investigation, the Royal George Mine, the Roy Hill Mine and the Mt. Montgomery area, and an initial plan of assessment work has been outlined. The results of the airborne geophysical survey cannot be taken into account since although this survey has been completed the results are not yet available. However, it is considered that the results will not alter the recommendations already made.

The report begins with a "Summary and Conclusions" section which is followed by the main body of the report.



Asst. Chief Geologist

BS/BMS
Encl.

Distribution:

Managing Director.
Superintendent
File (2)

PRELIMINARY REPORT ON ROYAL GEORGE MINERALISED AREA

SUMMARY AND CONCLUSIONS

The mineralisation in the area consists of cassiterite veins within a granite host (plate A3). The veins of economic importance all strike in a north-westerly direction and the most important orebodies have been found at the intersection of veins within this 345 degree set. (e.g. at Roy Hill and Royal George). Previous mining operations have been on a small scale and naturally concerned with a high grade production of up to 2 to 3% tin. However, it is in the lower grade (plus 0.5% tin) higher tonnage product that the hope of any future production must rest. With this feature in mind three zones of interest have been outlined.

A. Royal George Mine (page 6)

a. Mining operations by the old Royal George Tin Mining Company were confined to the development of an opencut 850 feet in length, 80 feet wide and 40 feet deep. The middle of the cut is the meeting place of two sets of veins, trending 345° and 340° and their intersection appears to have caused an enrichment in tin values in that not only are the individual veins above average grade but the unaltered, intervening granite contains 0.15 to 0.32% tin. The underground workings consist of an adit on No. 1 Level 40 to 60 feet below surface, and No. 2 Level 60 feet below the No. 1 Level. Between these two levels Reid and Henderson (1929) estimated a developed ore reserve of 23,000 tons of 0.74% tin. This grade agrees with the fragmentary mill records and the bulk sampling of the lode which was carried out just before cessation of mining by the Royal George Company in 1922.

Production is estimated by Reid and Henderson (1929) to be not less than 900 tons of tin concentrate, presumably of a grade of about 70% cassiterite. There is no record of the tonnage of ore treated in order to obtain this concentrate.

b. Title to the Area According to the mineral lease chart issued by the Department of Mines on the 12th August of this year the opencut is situated on the old 80 acre lease 1007M now held by V. Pitulej under lease numbers 81/M and 82/M, and J.M. McGowan under lease numbers 11164M and 11411M. A surrounding area of approximately 1 square mile is held by V. Pitulej under lease numbers 7M, 8M, 18M, 19M, 24M, 480P, 489P, 490P, 492P, and 499P. The remaining area to the west and north is held under our S.P.L. 333 (E.A. Henderson). It is recommended that an option is

A. Royal George Mine (contd.)

obtained over these existing leases. Whilst an assessment would firstly be made on the area of the opencut, it is recommended that the surrounding leases are also covered in order to prevent possible difficulties in acquiring this ground later if a favourable report is issued on the Royal George opencut.

c. Assessment Work. The Mine is readily accessible by road. The assessment work would consist of surface mapping on a 100 scale, with sampling where necessary. Any accessible underground workings would be mapped on 40 scale, again sampling where necessary. If the results of this work were favourable further work could consist of drilling beneath the opencut.

B. Roy Hill Mine (page 8) and Mt. Montgomery Area (page 5).

These two areas are within our S.P.L. 333 and assessment work would consist primarily of surface mapping and sampling. They are on private land and a permit to enter would be required. The Roy Hill Mine is situated on land located to Robert Hepburn, and the Mt. Montgomery area to Robert Cowie.

The reader is referred to an article by J.A. Dunn "Tin in Australia" in the Chemical Engineering and Mining Review for November 15th, 1957 on page 42, which outlines Australia's future tin requirements.

TABLE 1

Cassiterite Production from Royal George Area

	<u>Primary</u>	<u>Placer</u>
1. Brookstead Tin Mines	32.5 tons	48.25 tons
2. St. Pauls River Tin	Nil	Nil ?
3. Hannah's Prospect	50	Nil
4. Royal George	900	Nil
5. Roy Hill *	50	50
	<hr/>	<hr/>
	1032.5 tons	98.25 tons
	<hr/>	<hr/>

TOTAL ESTIMATED PRODUCTION EQUALS 1130.75 tons of Concentrate
(70% cassiterite)

* The production from the Roy Hill Mine is estimated at 100 tons from both Primary and Placer deposits.

PRELIMINARY REPORT ON ROYAL GEORGE MINERALISED AREA

1. LOCATION

The Royal George mineralised area is situated in the valley of the St. Pauls River about 10 miles by road from Avoca towards Lewis Hill. The valley at this locality has a broad, flat floor at an elevation of 900 feet with sides rising to the peaks of St. Pauls Dome (3,368 ft.) on the north and Snow Hill (3,175 ft.) on the south. The valley sides have reached a fairly mature state of dissection and are, very largely, under cultivation. Above about 2,000 ft., the whole region is covered in fairly heavy timber.

Prospecting in this district led to the discovery of cassiterite in 1828. Active mining operations commenced about 1870 and since that date the production of the field has been approximately 1150 tons of tin concentrate. (Table 1).

2. GEOLOGY

A. Stratigraphy

(a) Mathinna Group (Silurian)

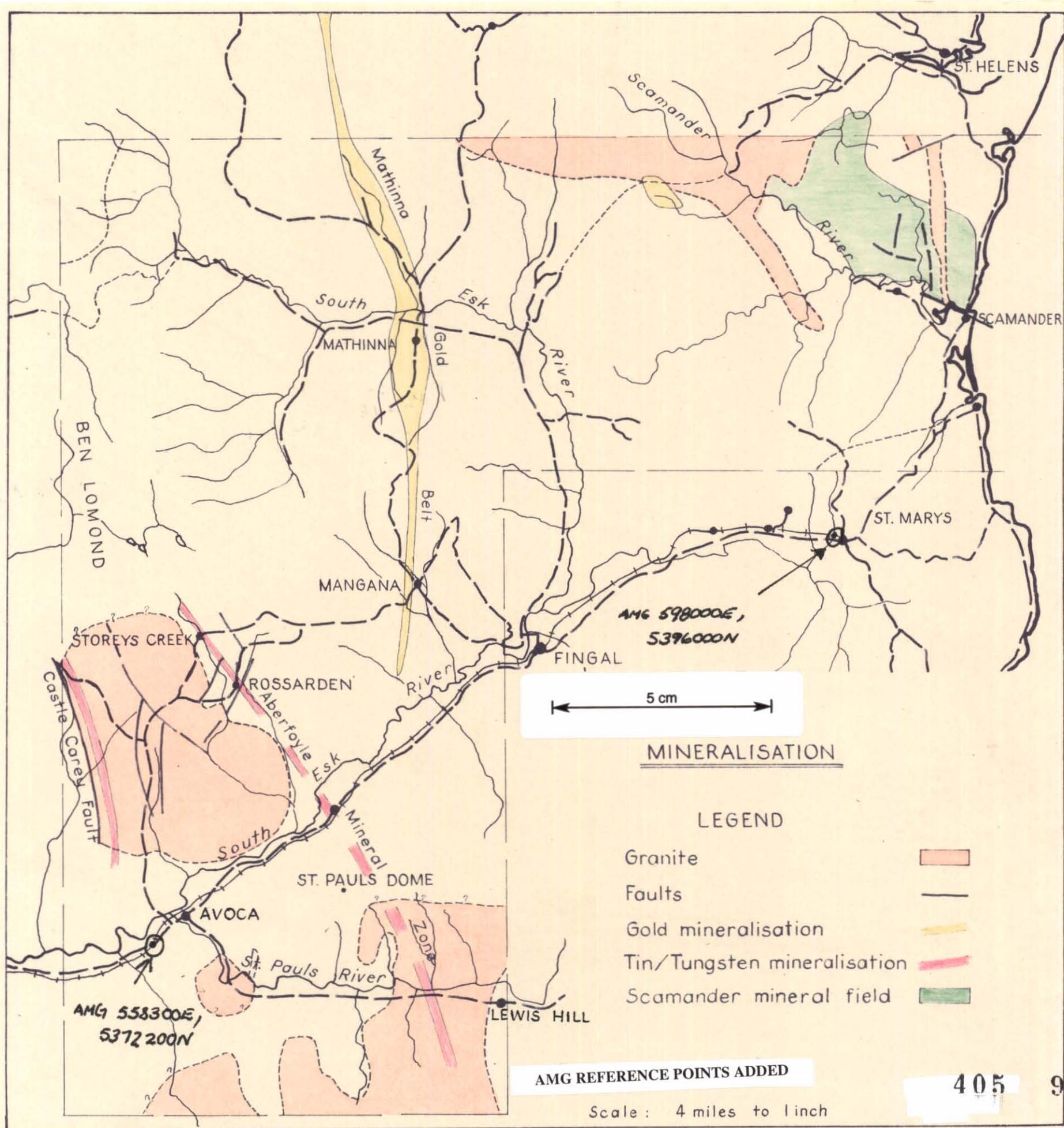
This Group crops out on both sides of the valley and it appears to have the same complex structure observed by workers elsewhere. Near Ormley the folding is tight and overturned to the east with axes plunging gently to the south. Very few records of the attitude of the Mathinna Group in the St. Pauls Valley are available.

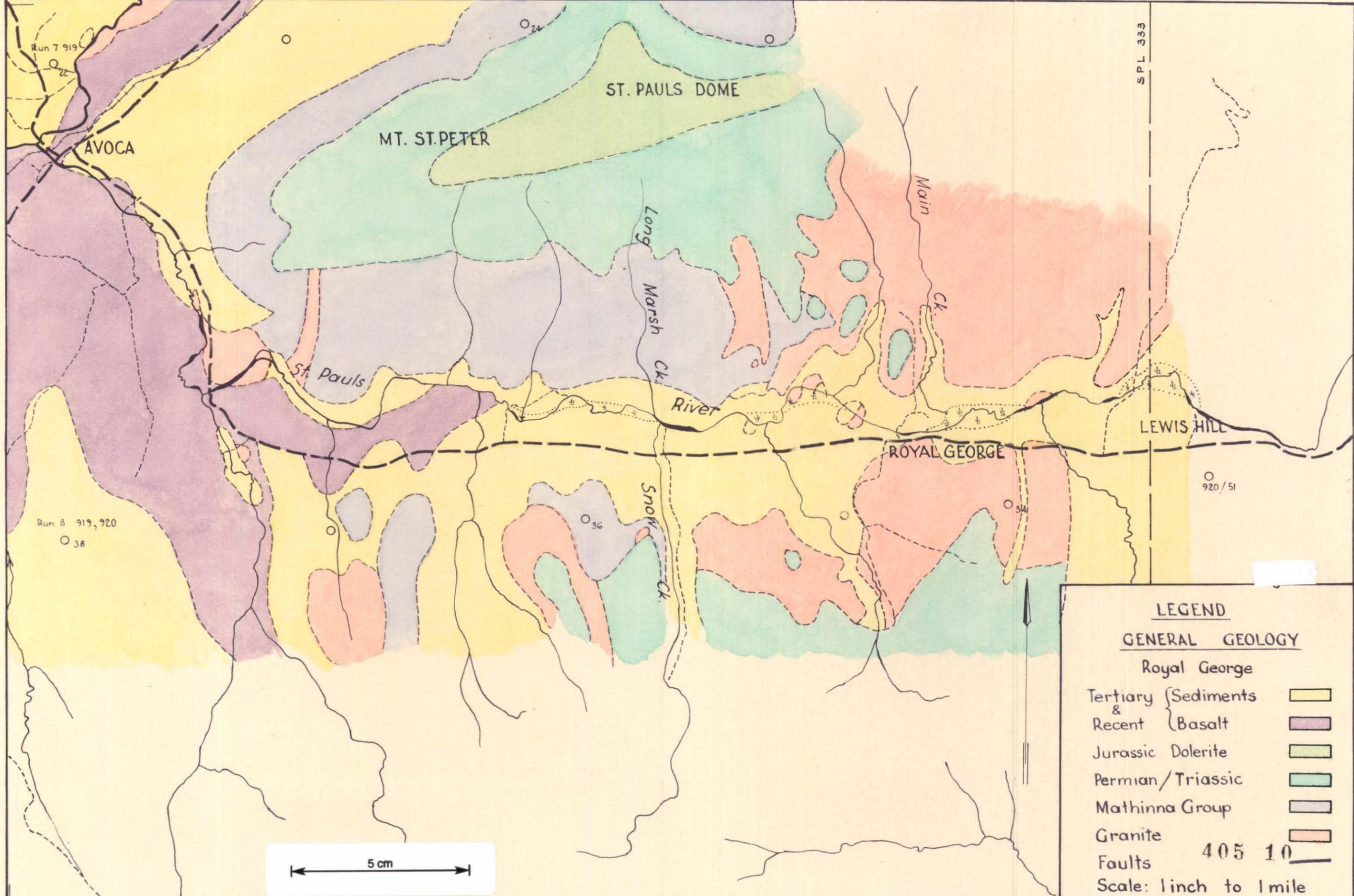
(b) Granite (Devonian)

Intruded into the Mathinna Group are granites which are assumed to be the source of the tin mineralisation. Both the granite and the Mathinna Group are to a large extent concealed by Permian or Tertiary/Recent sedimentary cover.

(c) Permian

Unconformably overlying the Mathinna Group are horizontally bedded conglomerates, sandstones and mudstones of Permian age. The basal conglomerates of this group occasionally carry alluvial tin.





SPL 333

LEGEND
GENERAL GEOLOGY

Royal George	
Tertiary & Recent	{ Sediments & Basalt
Jurassic	Dolerite
Permian/Triassic	
Mathinna Group	
Granite	
Faults	405 10
Scale: 1 inch to 1 mile	

5 cm

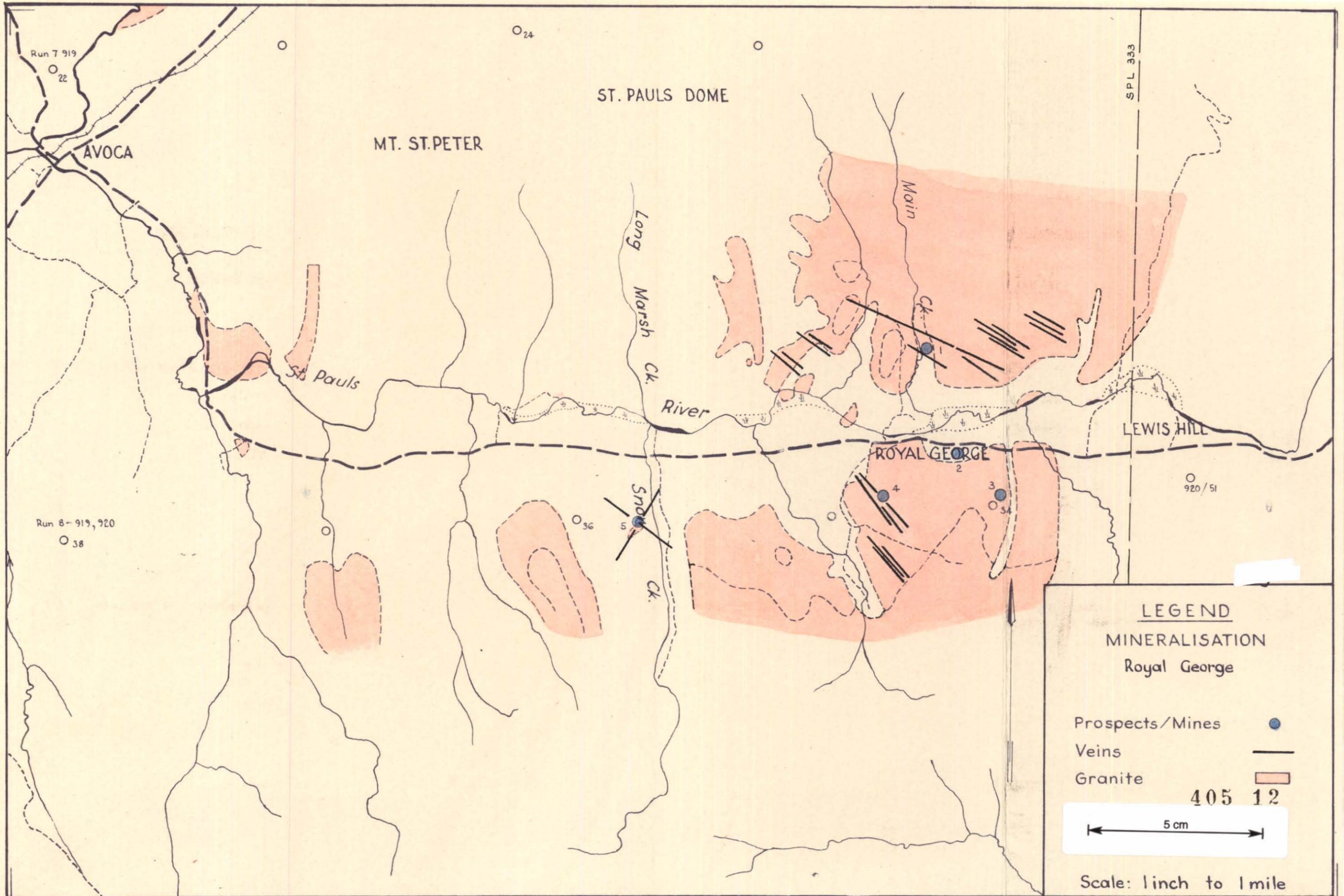
MINERALISATION - ROYAL GEORGE AREA

LIST OF PROSPECTS/MINES

1. Brookstead Estate (Mt. Montgomery)
2. St. Pauls River Tin
3. Hannah's Prospect
4. Royal George Mine
5. Roy Hill

The numbers correspond to the numbered prospect
on plate A3, opposite.

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LEGEND

MINERALISATION

Royal George

Prospects/Mines	●
Veins	—
Granite	■

405 12

5 cm

Scale: 1 inch to 1 mile

(d) Jurassic Dolerite

This rock forms the cap of the top of St. Pauls Dome, but otherwise only occurs as talus in the valley.

(e) Cainozoic

Alluvial gravels of Tertiary-Recent age have filled the valley to a considerable thickness, as noted by Reid and Henderson (1929).

B. Mineral deposits

The tin deposits can be divided into two groups:

(a) Primary deposits

Reid and Henderson (1929) noted several distinct modes of occurrence of the cassiterite (tin oxide), among them magmatic and pegmatitic segregations, quartz and greisen veins all within a granite host. Deposits of all these types are found in the Royal George area, but they are discussed in detail under the individual mines.

Mineral veins of economic importance all strike in a north-westerly direction, following a prominent joint trend which, at the Royal George Mine, strikes 320 degrees and dips at 75 degrees to the south-west.

(b) Alluvial deposits

These are found in Tertiary and Recent alluvials, although only the latter have been worked. However, the basal members of the Permian succession have been examined since they carry tin ore at Roy Hill (Reid and Henderson 1929) in the basal conglomerates.

3. DESCRIPTION OF MINES AND PROSPECTS

A. Brookstead Tin Mine (Plate A3, number 1)

(a) Location

This mine is situated on the old Brookstead Estate about 1 mile north of Royal George township.

(b) History

Cassiterite was first discovered in 1828 but the occurrence was not exploited until 1891 when the first of several companies to work this Estate was formed.

(c) Mineralisation

Primary cassiterite mineralisation occurs in quartz/tourmaline greisen veins within the granite. Cassiterite and tourmaline have replaced orthoclase and the former/ seems to be associated with hydro-micas. The associated sulphides include very minor amounts of chalcopyrite, sphalerite, arsenopyrite and galena. Near the veins muscovite is more abundant than biotite. The veins, which generally vary in width from 1 to 4 feet, trend north-westerly and dip to a high angle to the south-west. Whilst cassiterite occurs throughout their entire length, the richest concentrations are found in lenses which vary from 1 to 400 feet in length and contain 1 to 2% tin, with alternating poorer lengths. Within the plane of the vein the ore shoots pitch towards the north-west. Probably the most important mineralisation is that of the Mt. Montgomery area which is at the eastern end of the Estate. Here the veins are numerous and closely spaced and the intervening rock is wholly converted into greisen over widths of 10 to 15 feet. (Reid and Henderson in 1929). According to reports a recovery of $32\frac{1}{2}$ tons of cassiterite concentrate was made from 1500 tons of material treated, a grade of about 2% cassiterite.

Extensive deposits of cassiterite-bearing placers occupy the lower slopes and bottom of the St. Pauls River valley. They vary in age from lower Tertiary to Recent and consist of the debris resulting from the erosion of the adjoining granite slopes. According to Reid and Henderson (1929) apart from a deep lead, the value of which is not known, the Tertiary gravels are of no economic importance. Recent deposits of alluvial are not so extensive, but they are richer. The more important are in the south flowing tributaries of the St. Pauls River, notably those of the East, Main, Bailey and Panel Marsh Creeks. An average grade of portions of these grounds is given by Reid and Henderson (1929) as 2lbs/cassiterite/cubic yd. with a depth of up to 12 feet. A production of $48\frac{1}{2}$ tons of cassiterite is recorded, predominantly from the East Creek.

B. St. Pauls River Tin (2)

(a) Location

The mine is situated about 1 mile east of the town of Royal George on leases 4729/M, 8971/M and 8742/M but of these only 4729/M is still charted.

(b) Mineralisation

An alluvial property, this mine has been explored by test pits to a depth of 90 feet. Recent alluvium up to 20 feet thick carries tin values and is underlain by extensive, non-stanniferous Tertiary material. The Recent alluvium has been claimed to carry 2lb./cu.yd. cassiterite, although Reid and Henderson noted that it was unlikely to carry more than 0.5 lb/cu. yd.

There is no recorded production from this property.

C. Hannah's Prospect or Foster's Freehold (3)

(a) Location

This prospect is located immediately to the east of Royal George Mine on freehold land.

(b) Mineralisation

Primary and secondary deposits have been opened in the several workings. The primary deposits consist of greisen (315 degrees trend) and pegmatite (295 degrees trend) veins which carry tin values although the occurrence of the cassiterite appears to be quite sporadic. The secondary alluvial deposits are not of value, with a limited tonnage.

A production of over 50 tons of tin concentrates is recorded.

D. Royal George Mine (4)

(a) Location

The mine is situated about $\frac{1}{2}$ mile south of the township of Royal George

(b) History

Tin was first discovered in the Royal George area in the eighties of the last century but very little development was carried out until the formation of the Royal George Tin Mining Company in 1911. In 1922 the Company came to an end but during the eleven years they had produced most of the 900 tons of tin concentrate said to have come from this area. No production has taken place since 1922 although towards the end of 1954 Mr. A.E. Ringwood leased the mine area on behalf of a Melbourne syndicate. At the present time the old 80 acre Section 1007M on which the opencut is situated is held by J.W. McGowan on sections 11164M and 11411M, and V. Pitulej on sections 81M and 82M.

(c) Mineralisation

The host rock is granite which is effected by two directions of fissuring. The tin bearing greisen veins are restricted to a north-westerly trend and are related to a similar trending series of fine grained granite dykes and a prominent direction of jointing trending 320 degrees and dipping at 75 degrees to the south-west. A north-easterly trend contains blue quartz veins with tourmaline but are barren of cassiterite.

Mining operations on a commercial scale by the Royal George Tin Mining Company were restricted to section 10,007M. An opencut was developed on the greisen veins 850 feet in length, 80 feet wide at the middle, tapering to 10 feet at both ends, and 40 feet deep. The middle of the cut is the meeting place of two sets of veins, trending 345 degrees and 340 degrees and their intersection appears to have caused an enrichment in tin values in that not only are the individual veins above average grade but the unaltered, intervening granite contains 0.15 to 0.32% tin. The underground workings consist of an adit on No. 1 Level 40 to 60 feet below surface, and No. 2 Level 60 feet below the No. 1 Level. Between these two levels Reid and Henderson (1929) estimated a developed ore reserve of 23,000 tons of 0.74% tin. This grade agrees with the fragmentary mill records and the bulk sampling of the lode which was carried out just before cessation of mining by the Royal George Company in 1922.

Production is estimated by Reid and Henderson (1929) to be not less than 900 tons of tin concentrate, presumably of a grade of about 70% cassiterite. There is no record of the tonnage of ore treated to obtain this concentrate.

E. Roy Hill Tin Mine (5)

(a) Location

The mine is situated on freehold land $2\frac{1}{2}$ miles west of Royal George on the western side of Snow Creek and about 9 miles from Avoca.

(b) Mineralisation

The orebodies may be divided into two groups.

i). Main ore-body near the Western boundary of the property. This ore-body is a quartz-mica greisen body lying near the curved line of contact between granitic rocks and the Mathinna Group. The body is horseshoe in plan and it is formed by the intersection at Roy Hill of two lines of fissuring near the contact of the granite and sediments, one trending 345 degrees and the other 290 degrees. An opencut 360 ft. in length, 10 to 30 feet wide and 20 to 50 feet deep was developed on this orebody.

ii). Dyke Lode. The dyke lode appears to be the continuation of the greisen vein on the 290 degree trend already known on the Main orebody. The orebody, or bodies, consists of greisenised quartz porphyry dipping 75 degrees to the south. Grab samples of the materials on the dumps taken by Reid and Henderson in 1929 averaged between 0.32 and 4.32% tin. According to these two workers the mineralised zone is a very large body, with loose vein material covering the ground over a width of 200 feet and a length of 800 feet. This zone is also exposed in the Snow Creek, to the east of the mine.

Production amounts to at least 100 tons of tin concentrate, part of this production coming from the basal tin-bearing conglomerates of the Permian sedimentary cover.

4. CONCLUSIONS

1. Tin is the only mineralisation of economic importance which is likely to be found in this area.

2. Primary mineralisation is due to hydrothermal effects related to the late stage cooling history of the granite. Mineral veins of economic importance all strike in a north-westerly direction.

3. The tin mineralisation in the veins is irregular and the most important orebodies have been found at the intersection of the veins within the 345 degrees set. (e.g. at Roy Hill and Royal George). Previous mining operations have been on a small scale and naturally concerned with a high grade production of up to 2 to 3% tin. However, it is in the lower grade higher tonnage product that the hope of any future production must rest. With this point in mind three zones of interest have been outlined, the Mt. Montgomery area in the eastern part of the old Brookstead Estate, and the Royal George and Roy Hill area.

4. Alluvial tin has only been worked in Recent sediments and the production has been very small. The Tertiary sediments, apart from a reputed deep lead in the St. Pauls River valley, carry little or no cassiterite.

5. RECOMMENDATIONS

These have already been outlined under "Summary and Conclusions" at the beginning of this report.

BS/BMS


Asst. Chief Geologist.

September, 1958.

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