R/B 68/28

DEPARTMENT OF MINES
SOUTH AUSTRALIA

LEAD - KANGARILLA MINE

Section 796 Hd. Kuitpo

- J.H. Wilson -

by

M.G. MASON
GEOLOGIST
METALLIC MINERALS SECTION

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Rept.Bk.No. 68/28
G.S. No. 4179
D.M. 753/68

27th February, 1969.

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ABSTRACT

The Kangarilla lead mine, situated on section 796, Hundred of Kuitpo, is enclosed by the Stonyfell Quartzite (Proterozoic Age). Lead mineralization occurs in a narrow near-vertical joint or fault of average width 2ins. and strike length over 200ft. The lead occurs as galena and cerussite in bunches comprising from 20 to 70% of the vein material.

No thicker portions of the vein as mined are anticipated and if parallel veins to the north or south exist they would probably be no wider.

No further exploration is warranted.

KEYWORDS - Kangarilla, Echunga 1 mile, Lead, Structure, Stonyfell Quartzite, Proterozoic, Fault, Joint, 1969.

INTRODUCTION

The Kangarilla lead Mine situated on Section 796, Hundred of Kuitpo is 1 mile north east Kangarilla township. (138° 40' 3" 35° 8' 50") and is on the Echunga 1 mile Atlas sheet. It was worked from 1887 to 1888. No production has been recorded although a few tons of ore were almost certainly mined and sold. Except for inspections in 1887 and 1888 by the Inspector of Mines no geological inspections have been carried out (See Record of Mines p. 180).

The mine is situated on the east flank of a flat bottomed valley. The workings are a horizontal adit at creek level connecting to the east with a 90ft. vertical shaft, two hundred feet horizontally up the slope. A pit between the adit and shaft is the only other working.

Following a request, in May 1968 from Mr. J.M. Wilson a geological inspection of the Kangarilla Lead Mine was carried out in August, 1968, by Senior Geologist, P. Miller. He advised that the property was not worthy of further development due to the small dimensions and steep dip of the mineralized veins.

In February, 1969, the author spent two days in the field mapping the mine in detail for Departmental records; surface geology was controlled by theodolite (surveyor S. Mills) while underground geology was controlled by tape and compass.

REGIONAL GEOLOGY

The Kangarilla lead mine is situated within the Stonyfell Quartzite near its contact with the Saddleworth Formation. The former comprises quartzites and minor siltstones, the latter slates and siltstones of Adelaidean Age. (See Fig. 1 (S7152)

The rocks have been metamorphosed to the biotite zone of the greenschist facies of regional metamorphism. (Offler and Fleming, 1968) and primary structures are often discernible especially in the quartzites.

The mine rocks are near the nose of a regional anticline, the axis being north south and plunging south and truncated by a major north northeast striking normal fault on its western flank and by a number of arcuate normal faults trending northeasterly from the mine area (see fig. 1.)

DETAILED GEOLOGY

Bedding throughout the mapped area is nearly constant, (see Fig. 2) striking at approx. 170°M and dipping 30-40° to east. Foliation within the slates of the Saddleworth Formation is at an angle to bedding, striking near 80°M and dipping about 40° to the south east.

The mineralization comprises galena, cerussite, clay and iron oxides in a small vein up to 3 inches wide. This mineralization has formed as a result of subsurface weathering (oxidation) of galena and iron oxides.

The vein is transverse to bedding and from available information is located entirely within the quartzite. It appears to be infilling a joint or possibly a small fault with minor movement and mineralization is confined to this zone and does not extend into the adjacent quartzite.

Fractures can be divided into three main categories:

A. Shear joints (may be minor movement)

B. Tension joints.

C. Post ore normal fault with breccia.

As far as can be determined no other fractures were formed prior to those in which the mineralization is found and the fractures were probably all formed during the one tectonic phase, probably during the late Cambrian.

CONCLUSIONS AND RECOMMENDATIONS

The Kangarilla lead mine is situated within the Stonyfell quartzite near its contact with the Saddleworth Formation both being Adelaidean in Age. Epigenetic lead mineralization controlled by fractures occurs in a steeply dipping joint or fault averaging two inches in thickness and over two hundred feet in length. Lead minerals average 20 to 70% of the vein filling.

Mineralization was probably introduced during the Late Cambrian orogeny.

No large increases in thickness of the vein are anticipated and no appreciably thicker veins are expected elsewhere in the area.

No further work is recommended at this prospect.

MGI:JKD:RV
27.2.1969

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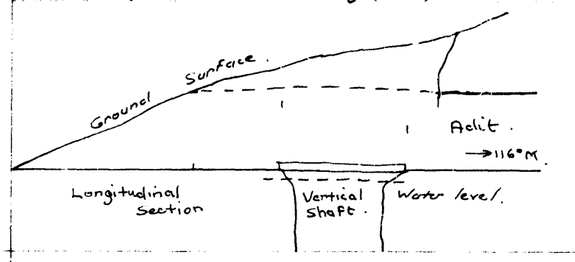
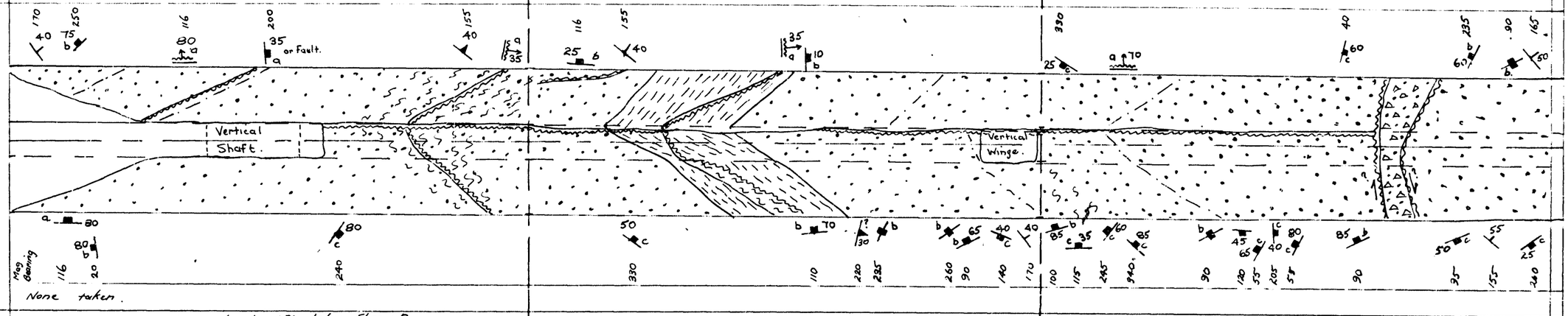
REFERENCES

BROWN, H.Y.L., 1908. Record of the Mines of South Australia - Dept. of Mines South Aust. p. 180.

OFFLER, R. & FLEMING, P.D., 1968. A Synthesis of Folding and Metamorphism in the Mt. Lofty Ranges South Australia. J. geol. Soc. Aust., 15 (2): pp.245-266, pls. 23, 24.

THOMSON, B.P. & HORWITZ, R.C., 1962. Barker 1:250,000 Geological Atlas Series Dept. of Mines S.Aust.

BEARING AND SLOPE	Reg. RL. Approx 875Ft. (From 1 mile map). 116°M. 108°T. Survey by tape and compass.
ROCK TYPE DESCRIPTION	PROTEROZOIC - ADELAIDE SYSTEM - TORRENSIAN SERIES - BURRA GROUP. STONEYFELL QUARTZITE. SANDSTONE - Medium grain size well rounded quartz, 70% white and buff. Rest Feldspar an altered to clay. Minor muscovite.
WEATHERING	Physically Fresh. Chemically slightly to moderately weathered. Weathering more intense along joint planes.
TUNNEL INTERSECTION PLANS AND CROSS SECTIONS	
ASSAYS (A)	None taken.
PETROLOGICAL SAMPLES (P)	None taken.
WALL / TOP / ROOF / TOP / WALL	
PHOTOGRAPHS	None taken.
GROUNDWATER - quantity & date.	Water level 1Ft below Floor of drive in shaft. Slight seepage along rest of drive from fault seam.
STRUCTURES JOINTING Pattern - attitude, spacing, persistence, character, surface, separation, coating. FAULTS, SHEARED & CRUSHED ZONES Attitude, relative displacement, width, character of material. FOLDS, Classification, plunge, axial plane, size persistence.	Bedding - Prominent layering in pants - accepted as bedding in Sandstone. Foliation in schist parallels bedding. JOINTS - 70a Master joint - may be minor movement and grade to greater than 30Ft extent. Few mm to 6 inches wide. Fault or shear. 70b Major joint - planar, greater than 5Ft extent uncoated up to Few mm. wide. 70c Minior joint - planar to wavy - less 5Ft extent. no coating less few mm. width. MINERALIZATION - in a fault or "a" joint extents probably For Varies From 1/10 inch to 4 inches in width. oxides probably after sulphides. Minor veins. Full length of drive (Minor offset at 135Ft). 20% - 70% galena or oxidates next iron From main vein and fine blebs in holes in country rock. Lead and iron oxides occur in separate clumps. FAULTS or SHEARS - At 38. and 68Ft appear to be sheers in character. Adjacent rock tends to be Foliated. Near planar, slightly wavy surface. "a" type in extent. Average 2 inches width. Matrix sand and clay particles (weathering products from sandstone. FAULT:- 2 to 5Ft wide walls overall near planar although irregular in detail. Matrix angular to subrounded sandstone fragments. with 20% sand and clay. Movement "apparent" East block south. ?
REFERENCES	Rpt Bk 45/120 (Hydrological Report.) Record of Mines 1908 p 180 Summary Card 164.

note - north wall of drive through to 135Ft is joint or Fault face.

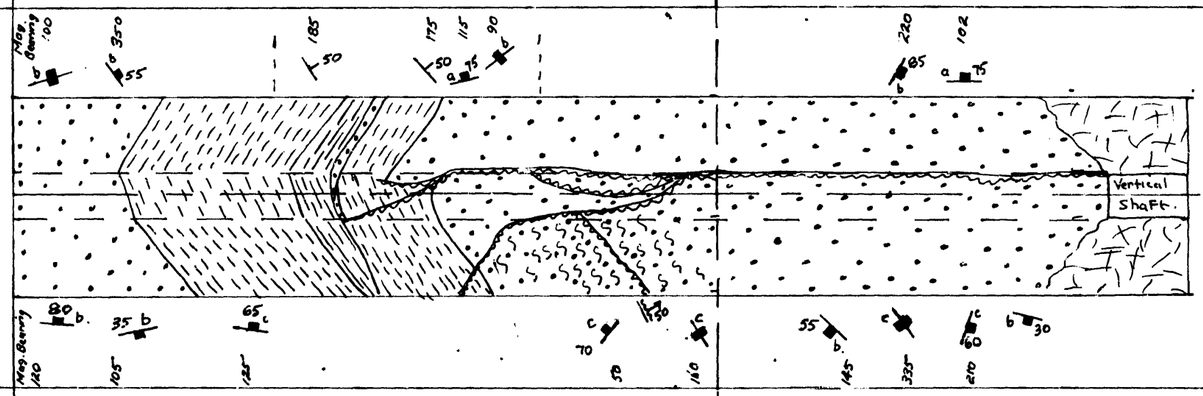
LEGEND

- Timbering
- 70 Strike & dip of bedding. Vertical. X Horizontal.
- 20 Strike & dip of cleavage
- 60 " " " " jointing
- Vertical jointing.
- Horizontal jointing
- Plunge of Lineation.
- 60 Crushed zones. or joints
- Shears or faults showing movement
- Mineralized vein, in Fracture.
- Breccia within Shear or Fault zone
- Shearing in rock adjacent to Fault or shear zone
- 60 Foliation. Strike Dip

PROTEROZOIC BURRA GROUP STONEYFELL QUARTZITE

- SANDSTONE
- SCHIST.

METALLICS SECTION		S.A. DEPARTMENT OF MINES
LOGGED M.G.M.	Geologist	LEAD - KANGARILLA MINE Sect 796 Ho. KUITPO TUNNEL GEOLOGICAL LOG - ADIT (J. H. Wilson)
DRAWN M.G.M.	Senior Geologist	SCALE: 1"=10ft | DATE LOGGED 6th Feb 1969 | SHEET 1 OF 2 | 69-83 Ha10

BEARING AND SLOPE (Surveying Data).	150 Ft. 116°M 108°T → Peg. 128°M 120°T. Peg ▲ 102°M 94°T Survey by tape and compass.	Rises Few Feet From entrance of adit. End of tunnel. 200Ft
ROCK TYPE DESCRIPTION	PROTEROZOIC - ADELAIDE SYSTEM - TORRENSIAN SERIES - BURRA GROUP - STONEYFELL QUARTZITE SANDSTONE See Before. SCHIST See Before. SCHIST See Before. SCHIST as before. SANDSTONE - as before Green 65% 20% chloritic and mica rock Feldspar and clay	
WEATHERING	Physically Fresh For Sandstone - Moderate for Schist. chemically Slightly weathered. - moderately weathered along joints.	
TUNNEL INTERSECTION PLANS AND CROSS SECTIONS		→102°M. Longitudinal Section.
ASSAYS (A)		
PETROLOGICAL SAMPLES (P)		
WALL / **TOP** / **ROOF** / **TOP** / **WALL**		
PHOTOGRAPHS		
GROUNDWATER - *quantity & date.*		Flow (20g.p.h.) from shaft. 6 Feb 69.
STRUCTURES JOINTING *Pattern - attitude, spacing, persistence, character, surface, separation, coating.* FAULTS, SHEARED & CRUSHED ZONES *Attitude, relative displacement, width, character of material.* FOLDS, *Classification, plunge, axial plane, size persistence.*	Bedding - Prominent layering in part - Accepted as bedding in sandstone. Foliation in schist parallels bedding. JOINTS - a 70 Master Joint - may be minor movement i.e. grade to Fault or shear. Greater than 30Ft extent. 2mm. to 6inches wide. b 70 Major Joint - planar greater than 5Ft extent. uncoated. Up to few m.m. wide. c 70 Minor Joint - planar to wavy. Less 5Ft extent. No coating Less Few mm. width. MINERALISATION - in a Fault or "a" joint From 175 Ft to end of drive. Probably same vein as exposed in previous part of tunnel. Average 1inch wide. 20% galena on oxidised melt clay and iron oxides (originally sulphides.) Very minor mineralisation in vughs in adjacent quartzite.	North Wall From 180Ft is joint or Fault face. No bedding in sandstone in last 25 Feet of tunnel.
REFERENCES	Rpt. Bk. 45/120 (Hydrogeological Report.) Record of Mines 1908 p180. Summary Card 164.	

LEGEND

- Timbering
- 70 Strike & dip of bedding. Vertical. × Horizontal.
- 20 Strike & dip of clearage
- 60 " " " " jointing
- Vertical jointing.
- Horizontal jointing.
- Plunge of Lineation.
- 60 Crushed zones.
- Shears or faults showing movement
- Mineralized vein in Fracture
- Shearing adjacent to shear zone.

PROTEROZOIC BURRA GROUP STONEYFELL QUARTZITE

- SANDSTONE
- BROWN SCHIST
- GREEN SCHIST.

METALLICS SECTION

LOGGED M.G.M.	Geologist
DRAWN M.G.M.	Senior Geologist

S.A. DEPARTMENT OF MINES

LEAD KANGARILLA MINE
Sect. 796 HD MUITPO
GEOLOGICAL TUNNEL LOG - ADIT
(J.H. Wilson)

SCALE: 1" = 10ft | DATE LOGGED 6th Feb 1969 | SHEET 2 OF 2 | 69-83a Ha10

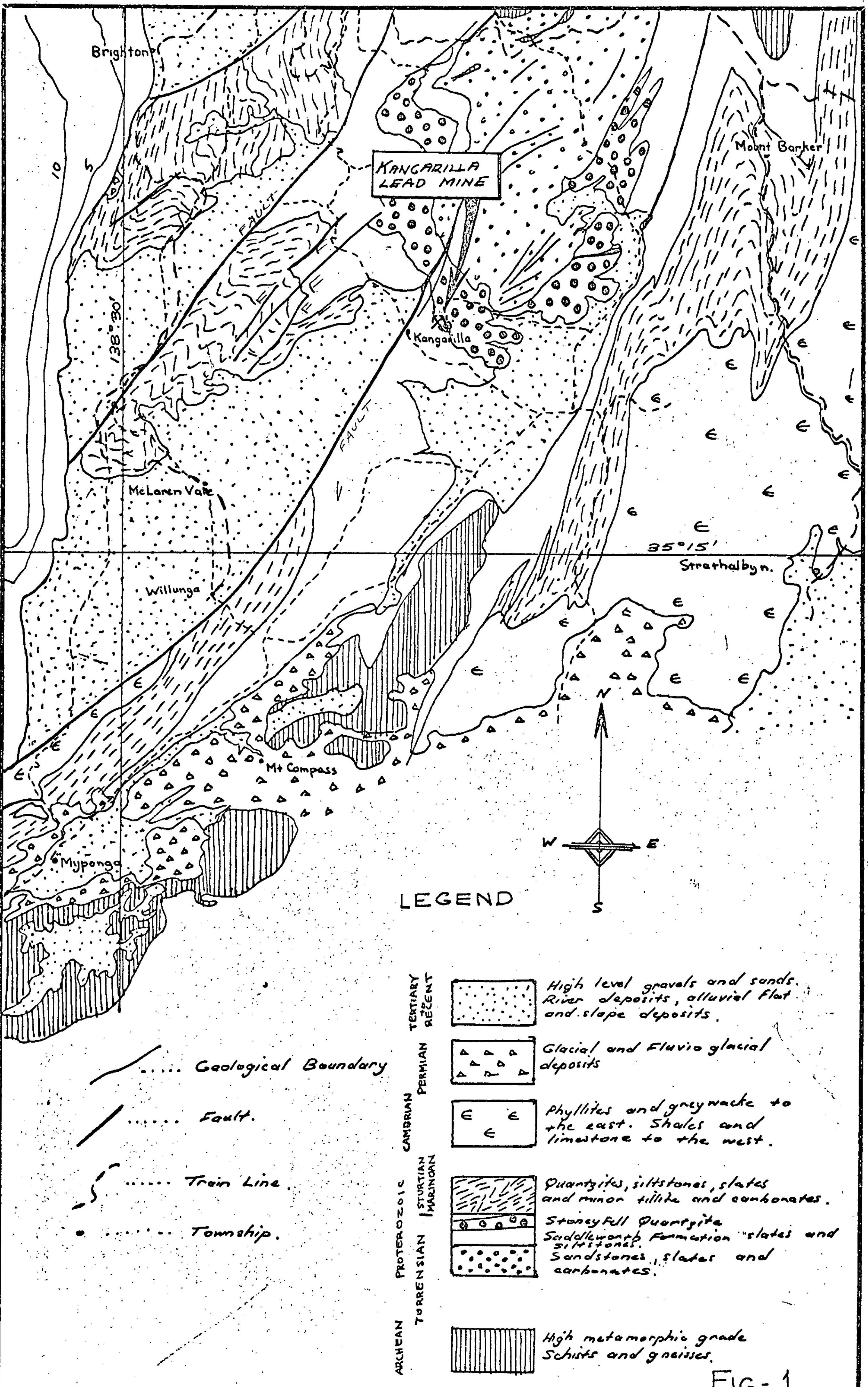
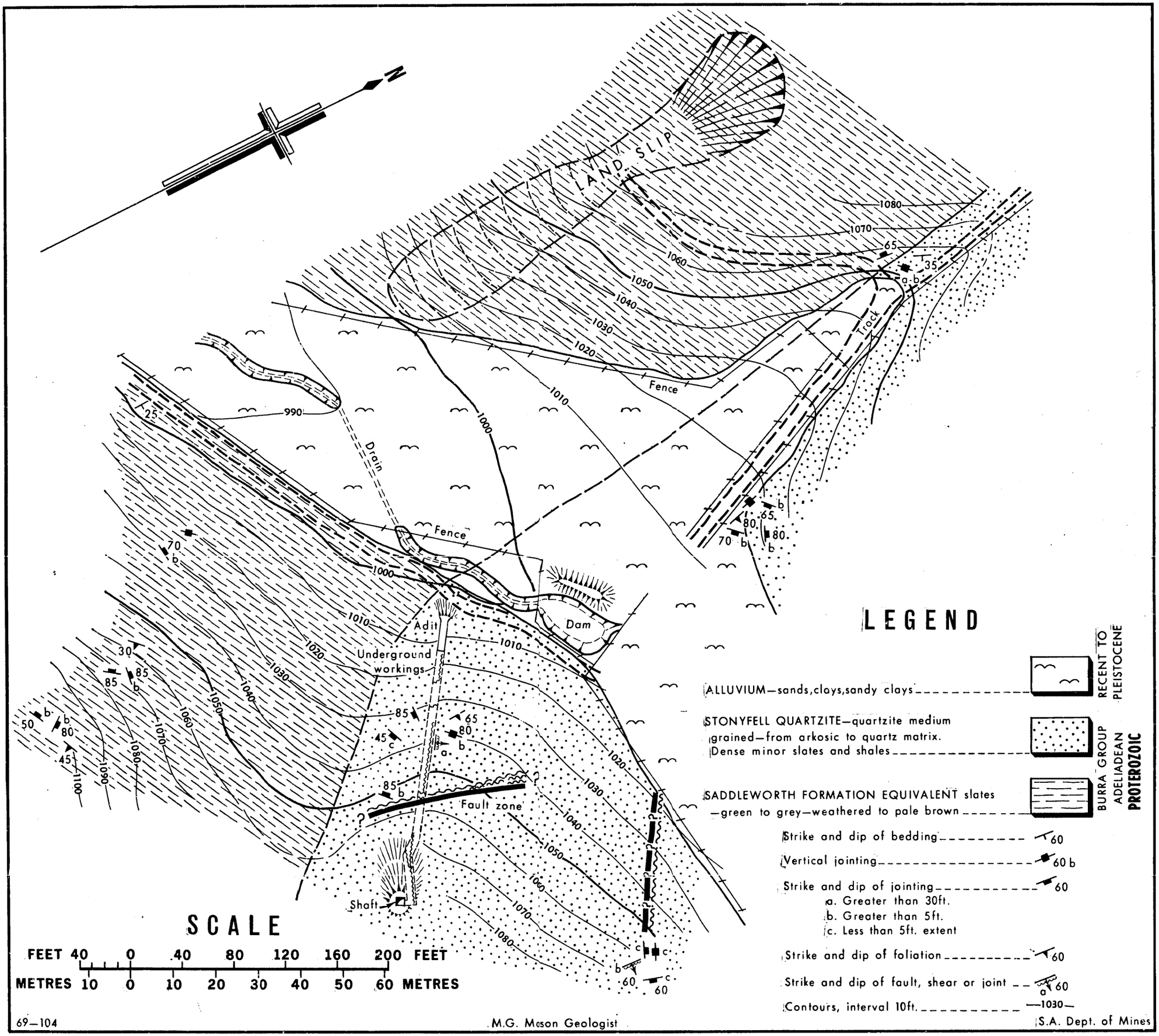


FIG-1

DEPARTMENT OF MINES — SOUTH AUSTRALIA

(signature)	Drn.	LEAD - KANGARILLA MINE Sect 796 H^D KUITPO REGIONAL GEOLOGY and LOCALITY PLAN (J. H. Wilson)	SCALE: 1 inch = 4 miles
	Tcd.		S7152 Ha10
	Ckd.		
	Exd.		DATE: 11 Feb 1969



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M.G. Mason Geologist

S.A. Dept. of Mines