DEPARTMENT OF MINES AND ENERGY
SOUTH AUSTRALIA

Rept. Bk. No. 80/119

DREW HILL PEGMATITE OLARY PROVINCE BIMBOWRIE STATION

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DEPARTMENT OF MINES AND ENERGY
SOUTH AUSTRALIA

Rept. Bk. No.80/11
D.M. No.645/7

DREW HILL PEGMATITE Olary Province
Bimbowrie Station

ABSTRACT

Drew Hill pegmatite, 200 m long and 45 m wide, is enclosed by quartz-feldspar-mica schist near Cathedral Rock, Olary Province. The pegmatite is an unzoned quartz-perthite-albite-muscovite body with limited reserves and variable mineral composition. No further work is recommended.

INTRODUCTION

Following mapping of four pegmatites that had been mined for feldspar (Olliver, 1973) and a review of chemical analyses of feldspar in Departmental records, reconnaissance sampling of pegmatites in the Olary Province was undertaken.

More than 100 individual pegmatites were inspected during 1975-1977 and 73 selected samples of feldspar were tested (Olliver and Stevenson, 1980).

During regional mapping (Forbes and Pitt, in press), a zone of pegmatites was located by G.M. Pitt (Geologist, Regional Geology Section).

The largest pegmatite, designated Drew Hill, within the zone was stadia surveyed, geologically mapped and sampled by the authors during September 1977.

LOCATION

The deposit is 1 km south of Cathedral Rock and 1.5 km northwest of Drew Hill on Bimbowrie Station, north out of

Counties, within the Far North Planning Area. The pegmatite is 0.6 km east of Raven Hill south Feldspar Mine (Fig. 1), which in 1980, is the only operating feldspar deposit in the State.

ACCESS

From Olary, the Bimbowrie road is travelled northwards (Fig. 1). The road bifurcates at a creek crossing 18.5 km from Olary and the easterly fork is followed past Old Boolcoomata Station. The pegmatite is in the hills 1 km south of Cathedral Rock and is 200 m north of a sampled portion of albite quartz gneiss (Conor and Harris 1980). Access to the deposit is by foot via a creek emerging from the hills, 0.5 km southeasterly from Cathedral Rock.

TENURE

The pegmatite is on Bimbowrie Station which is pastoral lease-hold property leased by Olcar Pty. Ltd. Currently the area is held by Esso Exploration and Production Australia Inc. under Exploration Licence No. 416.

GEOLOGICAL SETTING

The area consists of regional blocks of high grade Willyama Complex metamorphics including schist, gneiss and granitoid. The blocks are separated by corridors of weakly metamorphosed Adelaidean sediments. Figure 2 is based on the preliminary geological plan of Outalpa 1:50 000 sheet prepared by G.M. Pitt (Geologist, Regional Geology Section).

Drew Hill pegmatite is in the Boolcoomata block in schist and gneiss on the west-east limb of a regional fold. A calcsilicate bed is overlain to the south by banded gneiss which is overlain in turn by a zone of quartzo-feldspathic gneiss, 200 m wide, which is heavily altered to pegmatite. Drew

Plate 1 29942

DREW HILL pegmatite (Sept, 1977). View Southwest
The pegmatite outcrops boldly at the head of the
northerly draining gully.

Plate 2 29943

DREW HILL Pegmatite (Sept, 1977). Close up of outcrop.
The low angle joint near top of outcrop marks the
contact between the pegmatite in foregorund and
overlying indurated pegmatitic schist.

Hill pegmatite is the largest in the zone. Above the pegmatitic zone, there is a band of albite-quartz gneiss, 100 m wide, part of which has been geologically mapped and sampled (Conor and Harris 1980).

GEOLOGY OF THE PEGMATITE

Drew Hill pegmatite extends along a west-east trending valley and is semi-conformable within migmatitic quartz-feldspar-mica schist which is andalusite-bearing, to the south (Fig. 3).

The pegmatite is 230 m long with a maximum width of 45 m at line A. It pinches out to the east into a zone of mixed pegmatite and schist. Along the western margin, highly folded, indurated migmatite forms a roof over the pegmatite (Plate 2). An apoplysis extends further westwards from the southern margin into mica schist.

The pegmatite, which is not zoned, consists of felsic minerals: The range in mineral content and average in Table 1 is calculated from data in the Appendix.

TABLE 1

Mineral Composition (%)

Mineral	Range	Average
Quartz	10-60	31
Microcline perthite	10-75	42
albite	7-25	16
muscovite	5-25	11

SAMPLING

Twelve rock chip samples were taken from circles of 5 m radii about the surveyed sample points on lines across the pegmatite at 25-45 m intervals. The samples were submitted to the Australian Mineral Development Laboratories (AMDEL) for analysis.

RESULTS OF SAMPLING

The rock chip samples were analysed for SiO_2, Al_2O_3, Na_2O, K_2O and CaO. The range and average content calculated from the results tabulated in the Appendix is compared with the theoretical composition of pure orthoclase and pure albite in Table 2.

TABLE 2

Chemical Compositon (%)

	Drew Hill Pegmatite		Theoretical	
	Range	Average	Orthoclase	Albite
SiO_2	73.7-77.0	75.64	64.7	68.7
Al_2O_3	13.8-14.9	14.15	18.4	19.5
Na_2O	2.95-4.90	3.98	nil	11.8
K_2O	3.40-6.35	4.67	16.9	nil
CaO	0.13-0.26	0.20	nil	nil

The results of preliminary ceramic testing of two selected samples are reproduced in Table 3 for AMDEL Report MD 1/1/169, Progress Report No. 9 by Dr. W.G. Spencer. Biotite, magnetite and tourmaline which are present in trace amounts account for discolouration on firing.

TABLE 3

Fired samples, Colour and Degree on Firing

Sample No.	P717/77	P723/77
Firing Temperature (^oC)		
1050	pinkish grey very slight	pale fawn very slight
1100	pinkish grey slight	cream/off white slight
1150	grey part	pale grey part
1200	grey high	pale grey high

Terms for degree of fussion are

nil	no change in shape or volume
very slight	weakly sintered
slight	sintered
part	some melting, outlined preserved
high	almost complete melting, outline just visible
full	complete melting, globule produced.

RESERVES

A yield of 9 000 tonnes per vertical metre is inferred from 10 m east of Line C to 25 m west of Line A based on

specific gravity - 2.5

area of outcrop 3 700 m^2

CONCLUSIONS

Drew Hill pegmatite is an elongate unzoned body semi conformable to country rock schist of the Willyama Complex. The microcline perthite-quartz-albite-muscovite pegmatite contains an average of 3.98% Na_2O and 4.67% K_2O.

The small inferred reserves of 9 000 tonnes/vertical metre and the wide variation in mineral content do not warrant further investigation.

CHHC;RJH:AF

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REFERENCES

Conor, C.H.H., and Harris, R.J., 1980. Drew Hill albite-quartz gneiss, near Cathedral Rock, Olary Province. S. Aust. Dept. Mines Report 80/118 (unpublished).

Forbes, B.G., and Pitt, G.M., (in press). The Geology of the Olary 1:250 000 sheet. S. Aust. Dept. Mines report (unpublished).

Olliver, J.G., 1973. Feldspar Deposits, north of Olary. S. Aust. Dept. Mines report 73/237 (unpublished).

Olliver, J.G., and Stevenson, B.G., 1980. Pegmatites north of Olary, a review of feldspar and beryl mining and the results of reconnaissance sampling of feldspar. S. Aust. Dept. Mines report 80/119 Stevenson, B.G., 1980. (unpublished).

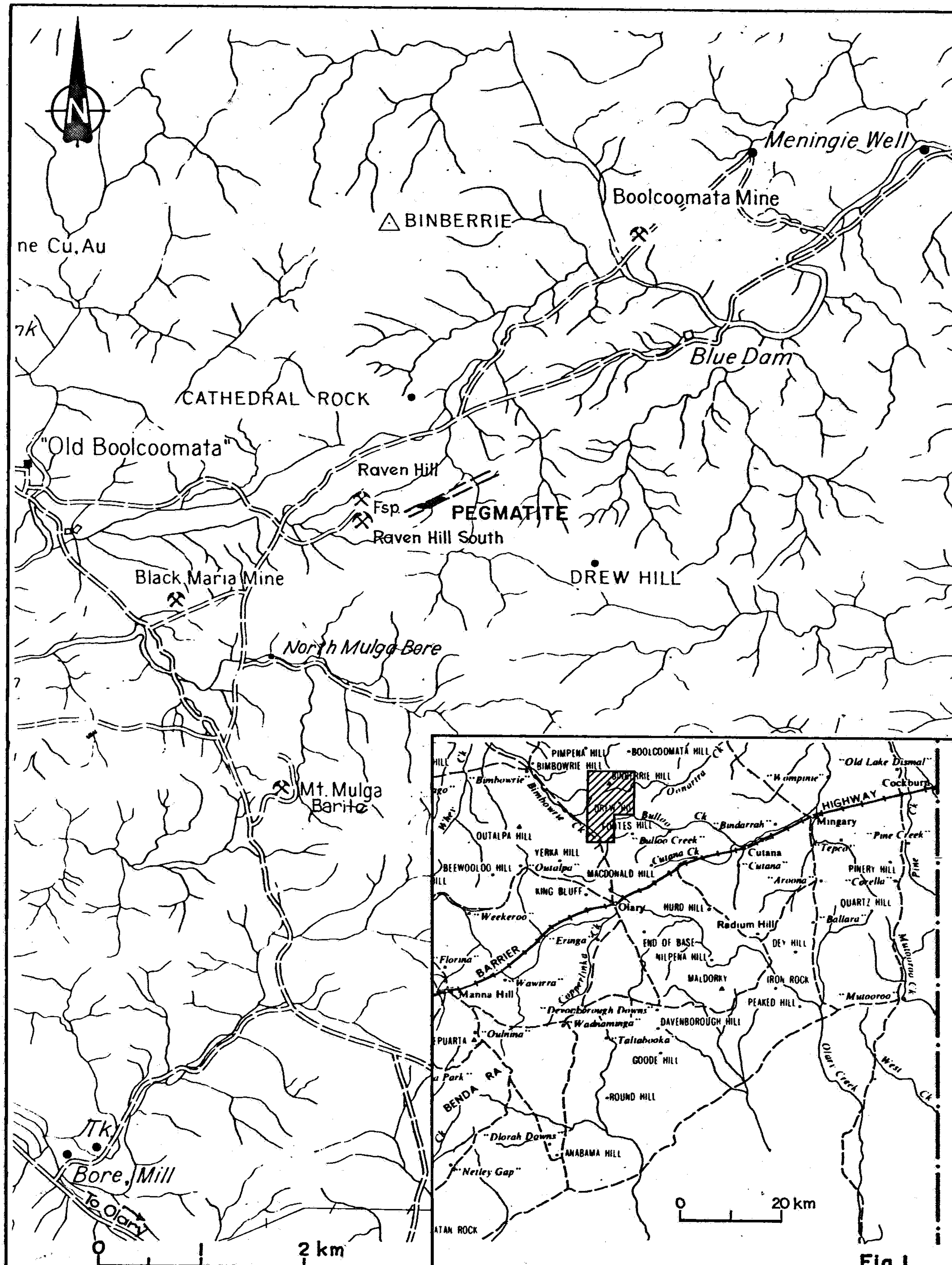
APPENDIX

Partial chemical analyses and visual estimates of mineralogy.

Extracted from AMDEL Progress Report No. 8 Project 1/1/169.

By Dr. B.G. Stevenson.

P-number/77 Location Analysis (wt %)	715 A1	716 A2	717 A3	718 A4	719 B5	720 B6	721 B7	722 C8	723 C9	724 C10	725 D11	726 D12
SiO_2	73.7	74.9	73.8	76.9	75.1	74.1	75.8	75.8	76.6	77.0	77.0	77.0
Al_2O_3	14.4	13.9	14.9	13.8	14.2	13.8	14.4	14.2	13.8	14.2	14.2	14.0
Na_2O	3.65	3.80	3.70	3.65	4.00	2.95	4.10	4.90	4.55	4.30	4.00	4.20
K_2O	3.40	4.65	3.48	5.30	4.65	6.20	4.92	3.70	4.95	3.92	6.35	4.48
CaO	0.18	0.26	0.15	0.20	0.21	0.13	0.22	0.22	0.22	0.26	0.15	0.21
Total	95.3	97.5	96.0	99.9	98.2	97.2	99.4	98.8	100.1	99.7	101.2	99.9
Mode (visual estimate)%												
Quartz	35	25	10	20	40	20	60	60	25	40	20	15
Perthite	>25	40	75	55	25	60-65	20	15	55	10	65	65
Albite	<20	20	10	10	25	10	15	20	10	25	7	15
Muscovite	20	15	5	10-15	10	7	5	5	10	25	7	5



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COMPILED: C.H.H.C.	DREW HILL PEGMATITE OLARY LOCALITY PLAN	DATE: MARCH 1978
DRN. A.F. / CKD.		PLAN NUMBER
L. Wright for C.D.O. 16/10/80		S13326

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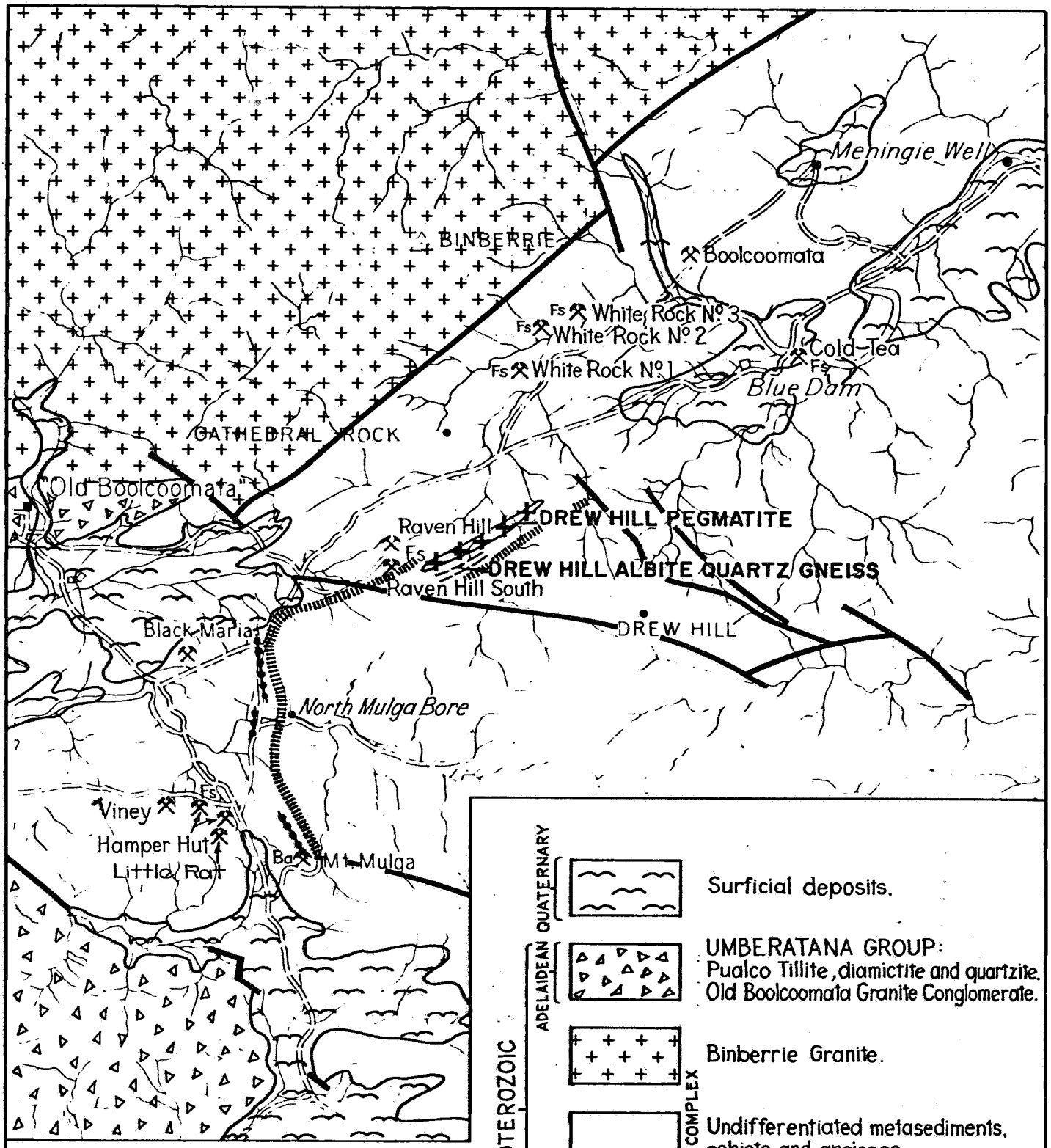

FIG. 2

	DEPARTMENT OF MINES AND ENERGY SOUTH AUSTRALIA	SCALE 1:50 000
COMPILED C.H.H.C	DREW HILL PEGMATITE OLARY REGIONAL GEOLOGY	DATE APRIL 1980
DRN A.F. CKD		PLAN NUMBER S15126
A.W. Wright for C.H.H. 16/10/80		

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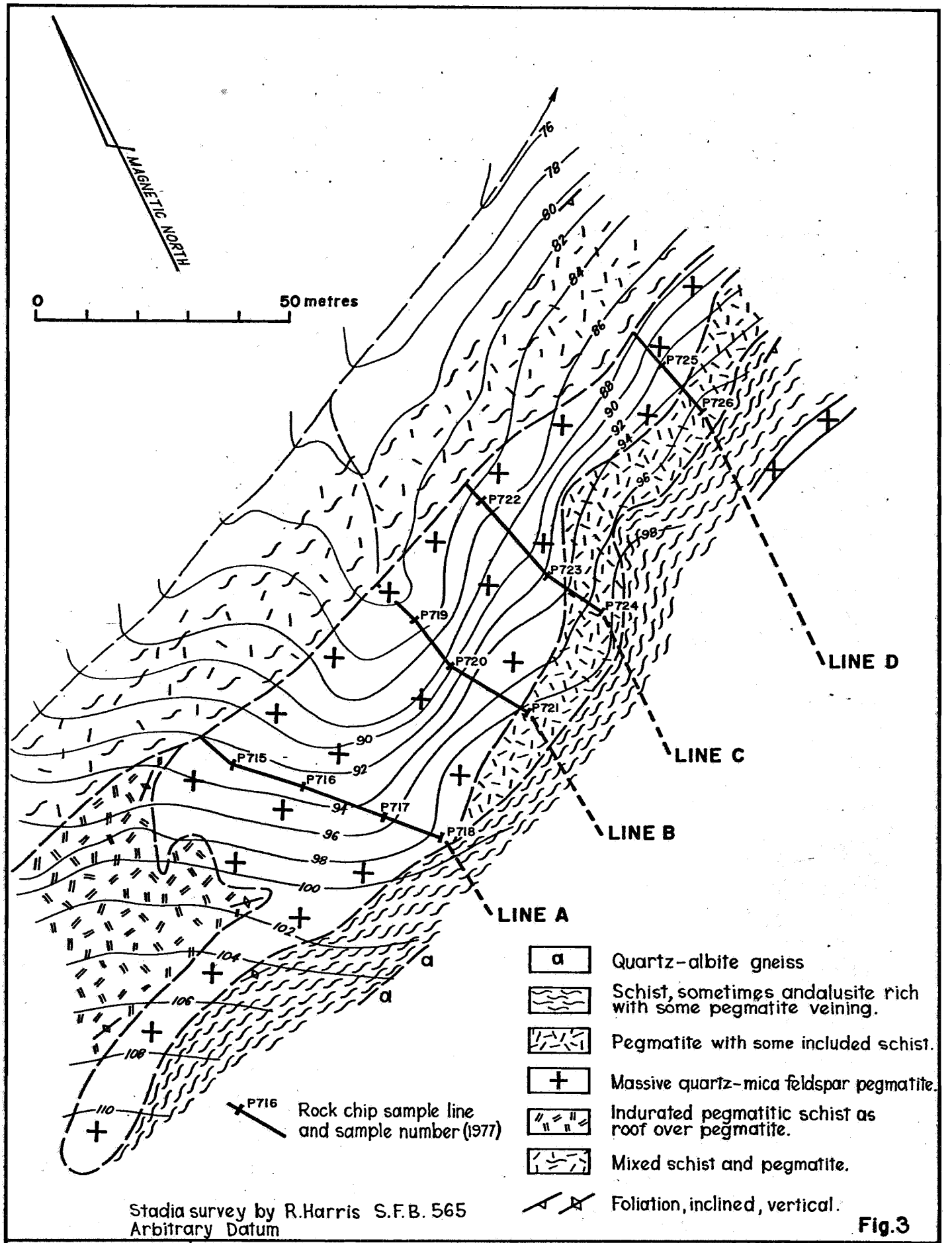

Stadia survey by R.Harris S.F.B. 565
Arbitrary Datum

Fig.3

	DEPARTMENT OF MINES AND ENERGY SOUTH AUSTRALIA	SCALE: 1:1000
COMPILED: C.H.H.C.	DREW HILL PEGMATITE OLARY GEOLOGICAL PLAN	DATE: MARCH 1978
DRN: A.F. CKD: L.A.Wright for C.P.A. 16/10/80		PLAN NUMBER S13327

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