/ 20.K

REPORT ON GEOLOGICAL INVESTIGATIONS OF EL 4921. MT. BARWOLLA.

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CONTENTS

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1. INTRODUCTION

The author was approached by Bedwin Pty. Ltd. to undertake a field investigation and evaluation of EL 4921.
This field investigation was conducted between the 1st of October 1987 and the 4th of October 1987.

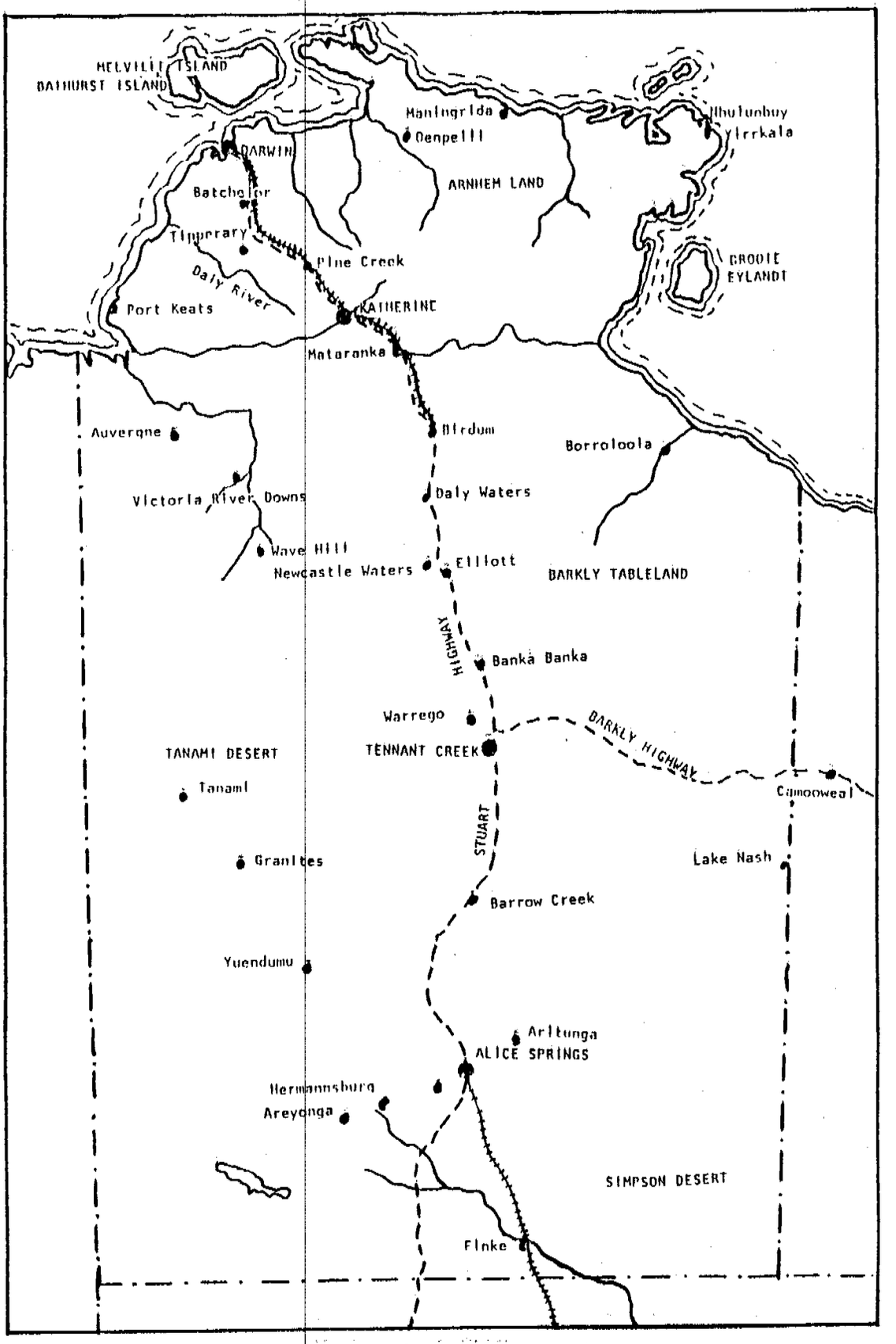
EL 4921 was granted in 1986 to L. Woodbridge and thus is in its second year of occupancy. The exploration licence was originally applied for with the intention of searching for a source of Barite and/or base metals.
It is located on Bradshaw Station and is accessed via the Dorisvale Road.

2. LOCATION AND ACCESS

EL 4921 occupies an area of 64 graticular blocks (211km^2) and is bounded by latitude 14^{o}53'S on its northern boundary, 130^{o}57'E on its eastern boundary, 14^{o}59'S on its southern boundary, and 130^{o}45'E on its western boundary.

It is located on Bradshaw Pastoral Station, which is owned by Bradshaw Coolibah Pty. Ltd.
Access to the exploration licence is via the Dorisvale Station access road which leaves the Stuart Highway 24km south of Pine Creek. From the Dorisvale Station homestead access is via the Wombungi Outstation and thence on station mustering roads.

At the time of investigation access to the exploration licence was excellent due to the owners of the station mustering cattle in the general area. Access is only possible during the dry season as it is obtained over a number of black soil plains which form the headwaters of the Fitzmaurace and Ankalari River Systems.



NORTHERN TERRITORY - LOCATION MAP

3. TOPOGRAPHY

The topography of that portion of the exploration licence that was examined during the field investigation represented a mature landsurface with remnant hills cropping out of what is essentially a flat landsurface bounded to the north and east by steep sided plateaux.

The sudden and total change in landforms is due to faulting, and the plateaux (of which Twins Peak is but one) represent rocks of a younger geological age, although still Lower Proterozoic.

The rugged ranges that bound the prospect area represent a much younger and more immature landsurface. This is due to their weathering resistant capping of sandstones of the Saddle Creek Formation.

The morphology of the prospect area is gently undulating colloidal flatlands interspersed with occasional northerly dipping ($\pm 4^{o}$) flat topped hills. These hills are also remnants due to their resistant capping of dolomitic limestone and barite rich material.

At the southern edge of the prospect area there is a very large rugged hill that stands out clearly as an anomalous land form. This hill is capped by weathering resistant sandstone and represents the most complete geological section from below the limestone barite horizon to a shallow water marine facies sandstone at its highest point.

4. REGIONAL GEOLOGY

The regional geology of the Twins Peak-Mt. Barwolla area may well be that as mapped on the 1:250 000 Fergusson River Geological sheet but the geology of the prospect area is somewhat different.

The ranges to the north and east of the prospect area are composed of siltstones that are part of the Ankalari Siltstone rock unit. These siltstones are overlain by weathering resistant sandstones of the Saddle Creek Formation. The prospect area consists predominantly of shales which represent a deeper water facies than that allocated to the Ankalari Siltstone.

5. PROSPECT GEOLOGY

The prospect area that was examined at the request of Bedwin Pty. Ltd. is covered by block numbers 2866, 2867, 2967, 3067, 3168 on the 20/4 Barwolla 1:100 000 tenement map. A significant proportion of the remainder of EL 4921 has been prospected by other workers associated with the Licence holder and this was the only area that the author was approached to examine.

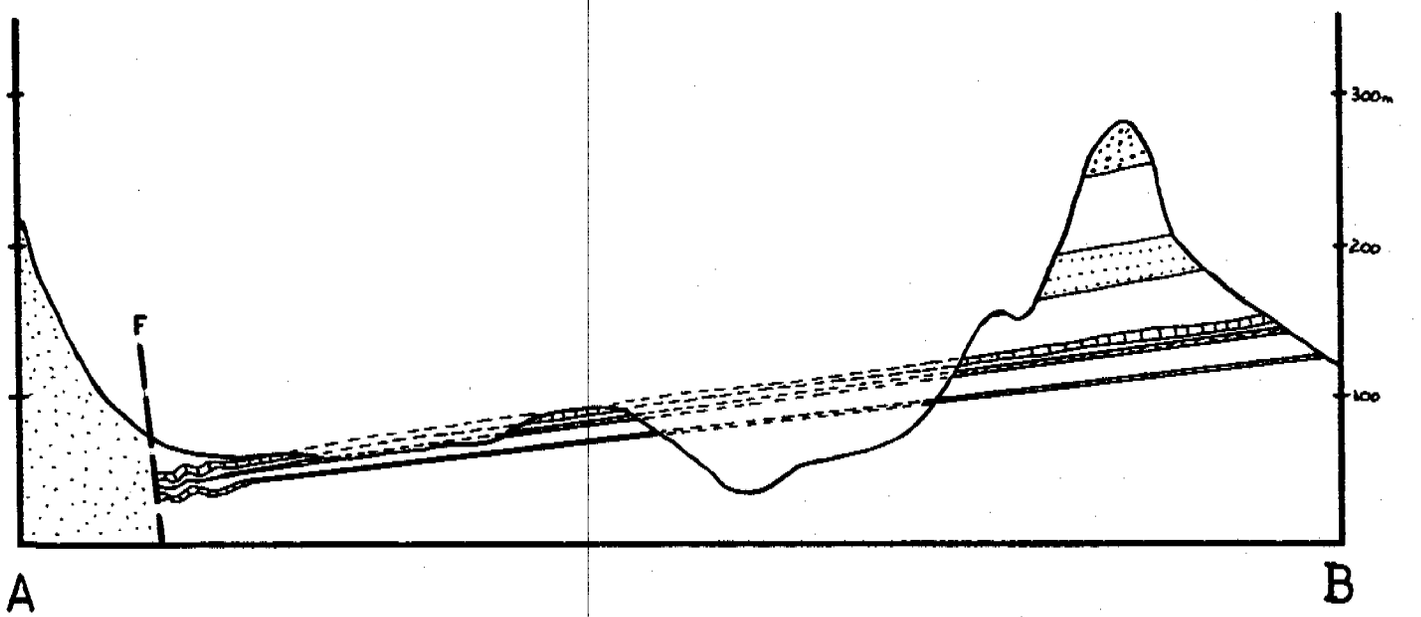
(i) Structure

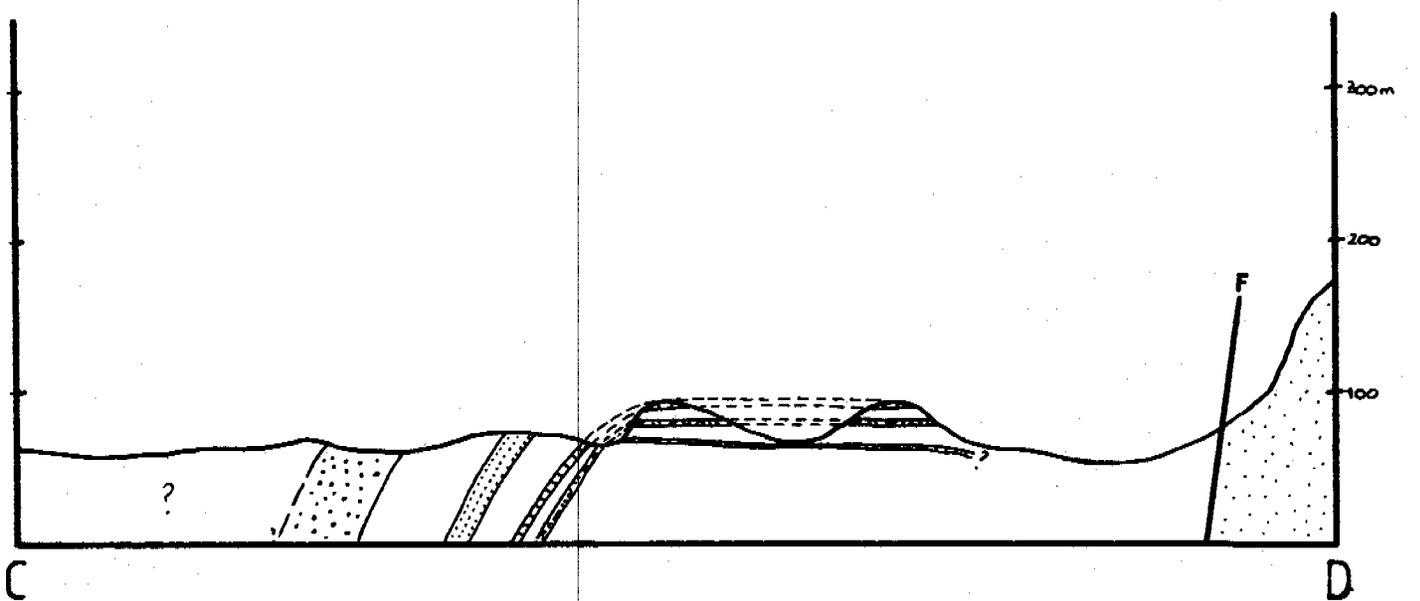
The prospect area lies adjacent to the intersection of two major faults which have caused this area to be upthrust.

The beds that form the prominent marker horizons, namely the dolomitic limestone/barite interbeds outcrop usually as a resistant capping. These are usually dipping to the north at $\pm 4^{o}$.

Where the hills and the marker beds intersect the residual landsurface, the marker horizon is tightly folded. This localised folding is probably due to the influence of dragging effects associated with a concealed east-west trending fault.

Fig. 2 Geological Cross Sections



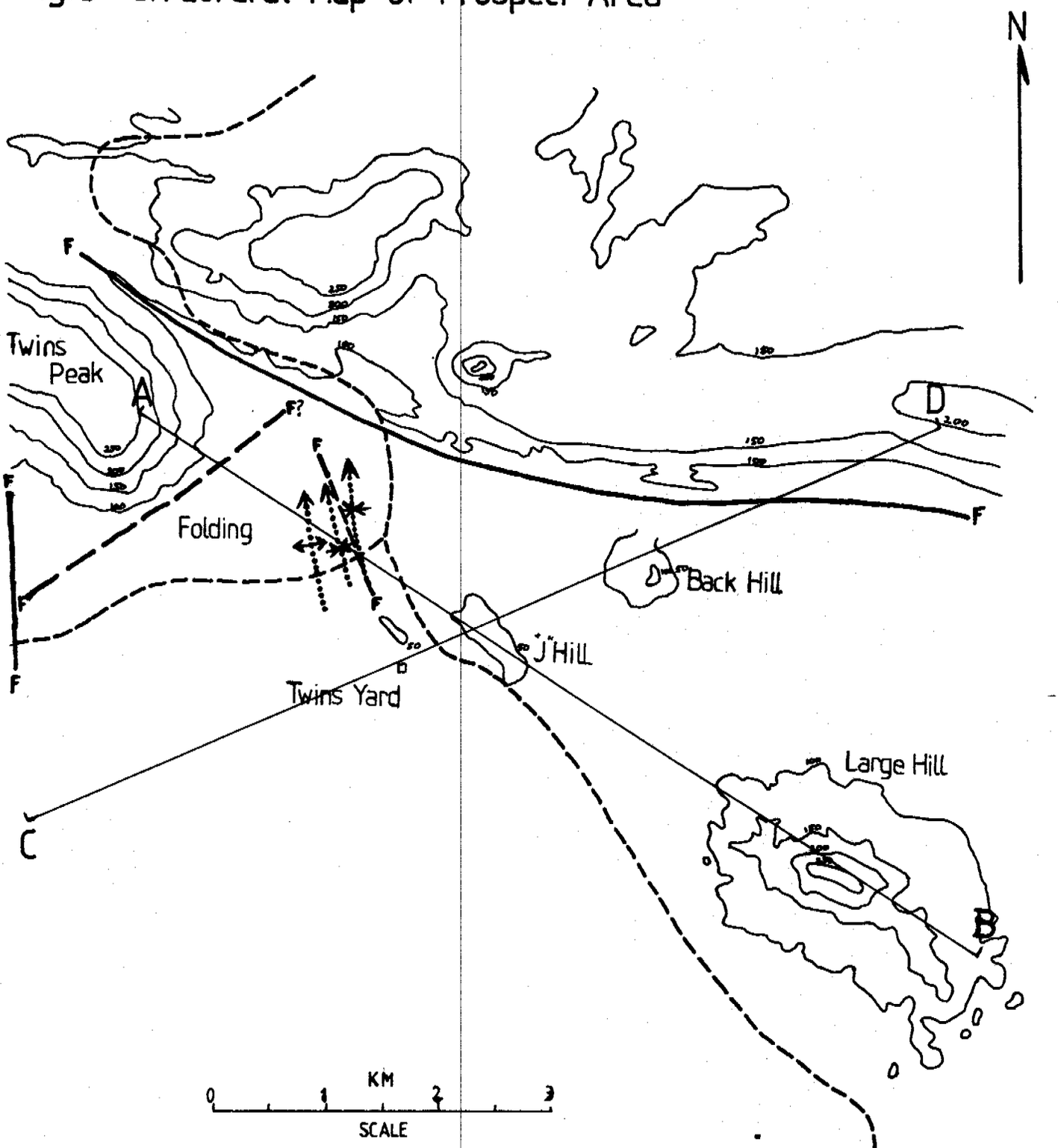


Vertical Scale / Horizontal Scale = 10 / 1

0 1 KM 2 3

Scale

Fig. 3 Structural Map of Prospect Area



(ii) Stratigraphy

The stratigraphy of the prospect area can best be described in terms of a shallowing upward marine regressive facies. At the observable base of the sequence the stratigraphy consists of interbedded red and grey shales. These have proven to be incompetent under the influence of weathering and disintegrate quite quickly into their component clays. Further evidence of their lack of cohesion can also be seen in their response to mud cracking in the residual landsurface. The flakes of shale align themselves with the mud cracks.

Interbedded with these incompetent red shales are somewhat more cohesive grey shales. Under the influence of weathering these break out of their beds quickly but do not disintegrate into their component clays at the same rate as the red shales.

Occurring in the upper part of the red shale unit are 7 thin barite horizons which occur stacked on top of one another. These horizons are 20-30mm thick interspersed with 5-10mm of red shale. They all contain visible secondary copper minerals throughout.

Occurring approximately 0.4m above the barite horizons is a dirty limestone unit which is composed of a soft ironrich limestone.

Overlying this dirty limestone is another sequence of interbedded grey and red shales with the red shales being the dominant lithology.

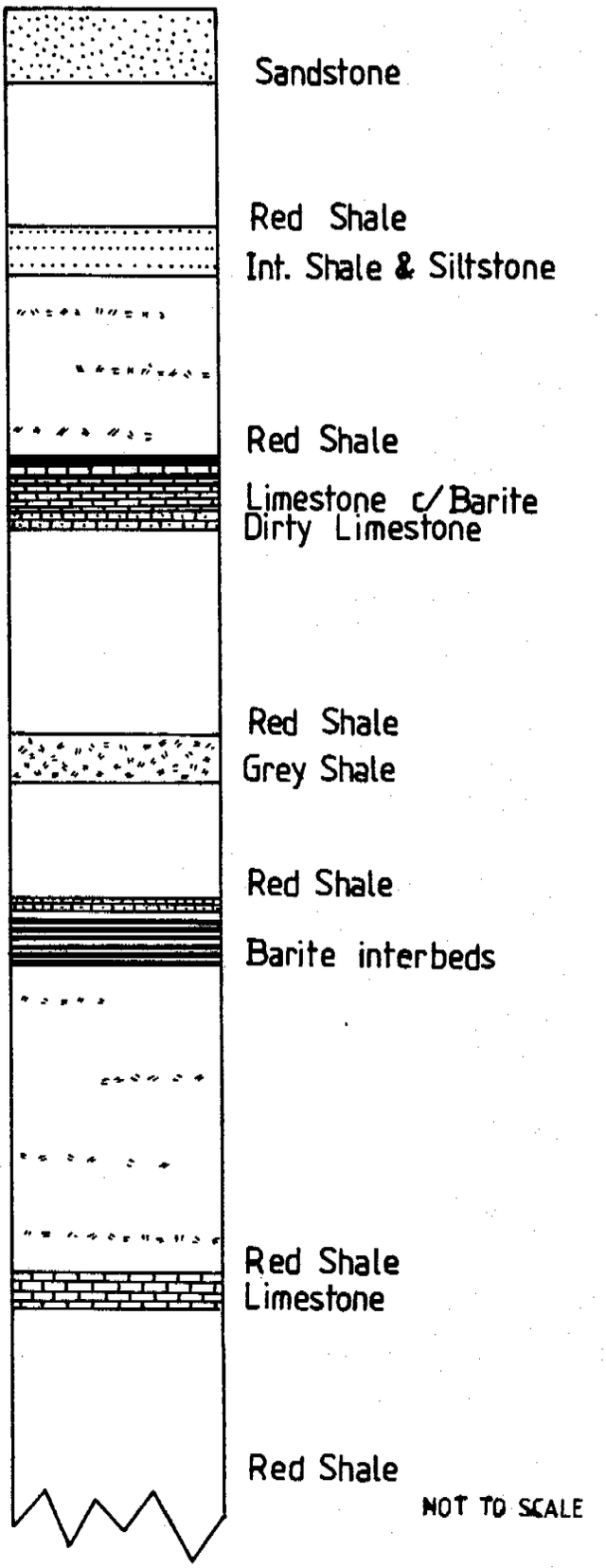
Above this sequence is another thin dirty limestone unit which in turn is overlain by a limestone that is dolomitic in places and contains a variable number of barite-rich interbeds which are usually of 30-60mm thickness. The limestone unit is rarely more than 1m thick with the barite-rich interbeds forming 25-30% of this thickness.

This sequence is again overlain by red shales which grade into an interbedded shale and siltstone unit. This unit shows up prominently on the largest hill due to its flaggy outcrop and higher proportion of vegetation growing along it.

This interbedded sequence is overlain by another red shale unit and a sandstone unit which forms the cap rock of the largest hill.

The above is diagrammatically represented in the stratigraphic column (Figure 4.)

Fig. 4 Stratigraphic Column of Prospect Area



6. GEOLOGICAL HISTORY

The dominant lithology of the prospect area (the red shale) was laid down in a moderately deep marine environment. The overall sequence represents a progressively shallowing upward depositional environment due to a regressive facies change.

At some time after lithification, faulting occurred with resultant uplifting of the prospect area. Subsequent weathering has resulted in the cap rock of sandstone being removed and the landsurface eroding to its present levels.

7. RESULTS

Investigations were concentrated on the barite rich beds and the limestone layers. The results of 38 samples are listed below:

Sample No.	Location and Rock Type	Assay Cu(ppm)/Ba(%)
B001	Ba - south end of large hill	120/23
B002	Interbedded silts & shales - south end of large hill	83/23
B003	Ba - $\frac{1}{2}$ way up south end of large hill	763/18
B004	L/S - eastern, north end of back hill	1870/33
B005	Ba - eastern, north end of back hill	1920/23
B006	L/S - western, north end of back hill	50/1.8
B007	Ba - western, north end of back hill	71/27
B008	Dirty L/S - western, north end of back hill	189/3.6
B009	Ba - eastern, south end of back hill	1000/13
B010	L/S - eastern, south end of back hill	158/4.6
B011	L/S - western, south end of back hill	138/2.1
B012	Ba - western, south end of back hill	556/34
B013	Ba vein - south end of back hill	148/17
B014	Ba - western, south end of J hill	160/26
B015	L/S - western, south end of J hill	157/3
B016	L/S - western, south end of J hill	135/3.2
B017	Ba - eastern, south end of J hill	170/25
B018	Ba - western, 300m north of B014-17	377/29
B019	L/S - western, 300m north of B014-17	400/4.6
B020	L/S - eastern, 300m north of B014-17	186/1.7
B021	Ba - eastern, 300m north of B014-17	90/29
B022	Ba - western, 200m north of B018-21	538/7.7
B023	Soil sample - middle of J hill	540/13.4
B024	Ba - continuation north of J hill	185/32
B025	Ba - intersection of old and new roads	82/29
B026	L/S - northern section, in folding	1240/6.3
B027	Ba - northern section, in folding	605/32
B028	Ba - northern section, in folding	625/34
B029	Ba - northern section, in folding	1370/32

Sample No.	Location and Rock Type		Assay Cu(ppm)/Ba(%)
B030	L/S - hill north of yards		72/4.3
B031	Ba - hill north of yards		33/29
B032	West of J hill No. 4 bed	Ba	15/29
B033	West of J hill No. 1 bed (top)	Ba	22/33
B034	West of J hill No. 2 bed	Ba	13/31
B035	West of J hill No. 3 bed	Ba	12/33
B036	West of J hill No. 5 bed	Ba	16/30
B037	West of J hill No. 6 bed (bottom)	Ba	9/32
B038	Soil sample - north of yard hill		120/28
B039	Wall rock from Pony Pocket Mine		138/3.3
B040	Ba ore from Pony Pocket Mine		51/28

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8. CONCLUSIONS

(a) Copper

All samples taken were assayed for copper due to the presence of visible secondary copper minerals in the barite rich horizons.

There were three areas that returned anomalous copper values (⩾ 1000ppm) these were:

(i)	Eastern, north end of back hill	B004	1870ppm
		B004	1920ppm
(ii)	Eastern, south end of back hill	B009	1000ppm
(iii)	Northern section, in folding	B029	1370ppm

Although these values were above the background levels for the areas, as established by the other samples, they are not of sufficiently high enough concentrations to point to the locality of what may be a viable copper deposit in the area.

(b) Barite

There were three areas that returned anomalous barium assays (> 30%), these were:

(i)	Western, south end of back hill	B012	34%
(ii)	Continuation north of J hill	B024	32%
(iii)	Northern section, in folding	B027	32%
		B028	34%
		B029	32%

Although these barium assays were above the standard levels set for the barite horizons when converting them from the element Ba to the oxide BaO using the conversion factor set out in the AIMM Field Geologists Manual (1.117), the highest assay gave a barite content of 38%, well below that needed to establish a viable barite deposit.

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PRELIMINARY REPORT

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PO Box 207, GREENWOOD 6042
Ph (09) 344 6811 Tlx 92716

AUSTRALIAN ASSAY LABORATORIES-PINE CREEK

REPORT : BA 010629 2 Page(s) Date : 29/10/87

Client reference : PC 828B Project : BED

Cost code :

Copies to :

Samples : Type Preparation code
Received : 13/10/87

Analysis	Code	Quality Parameter	Detection	Units
Cu	D300	Prec.10 %	2	ppm
Ta	D300	Prec.10 %	10	ppm
Ba	XRF	Prec.10 %	0.002	%

Comments :

*** Ta results to follow later ***

Senior Chemist : Alastair Inglis

PRELIMINARY REPORT

REPORT : BA 010629 Page 1 of 2

Sample	Cu	Ta	Ba%
B 001	120	---	23.0
B 002	83	---	23.0
B 003	763	---	18.0
B 004	1870	---	3.30
B 005	1920	---	23.0
B 006	80	---	1.80
B 007	71	---	27.0
B 008	189	---	3.60
B 009	1000	---	13.0
B 010	158	---	4.60
B 011	139	---	2.10
B 012	586	---	34.0
B 013	148	---	17.0
B 014	160	---	26.0
B 015	157	---	3.00
B 016	135	---	3.20
B 017	170	---	25.0
B 018	377	---	29.0
B 019	400	---	4.60
B 020	186	---	1.70
B 021	90	---	29.0
B 022	538	---	7.70
B 023	540	---	13.4
B 024	185	---	32.0
B 025	82	---	29.0

Data in ppm unless otherwise stated * see unit on fly sheet.

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REPORT : BA 010629 Page 2 of 2

Sample	Cu	Ta	Ba%
B 026	1240	—	6.30
B 027	605	—	32.0
B 028	625	—	34.0
B 029	1370	—	32.0
B 030	72	—	4.30
B 031	33	—	29.0
B 032	15	—	29.0
B 033	22	—	33.0
B 034	13	—	31.0
B 035	12	—	33.0
B 036	16	—	30.0
B 037	9	—	32.0
B 038	120	—	28.0
B 039	138	—	3.30
B 040	51	—	28.0

Data in ppm unless otherwise stated * see unit on fly sheet.

The Australian
Mineral Development
Laboratories

Marjorie Street, Berrimah
Northern Territory 5788
Phone Darwin (089)
32 2637
or 32 2815

Please address all
correspondence to
P.O. Box 58,
Berrimah N.T. 5788
In reply quote:

amdel

10th March, 1987

Our Ref : D598/87

REPORT NUMBER : D598/87

CLIENT : Territory Resources N L

CLIENT REFERENCE : Verbal Request

REPORT COMPRISING : Cover Page
Page 1

DATE RECEIVED : 2nd March, 1987

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ANALYSIS

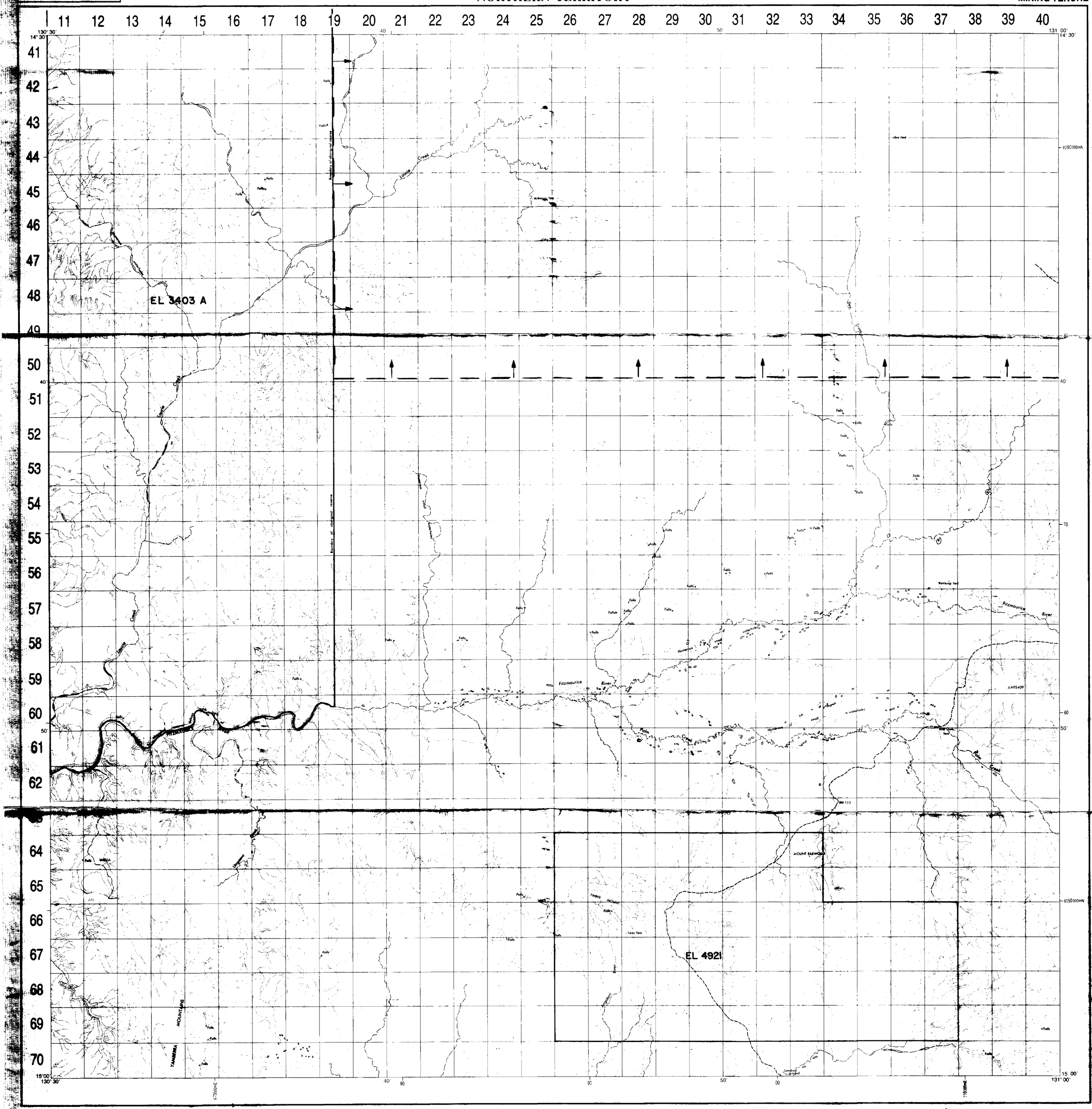
SAMPLE MARK	Au ppm	Ag ppm	Cu ppm	Pb ppm	Zn ppm	Ba %
TR2058	0.02	5	349	7	9	29.5
TR2059	0.02	<1	55	6	<5	4.60
TR2060	0.03	<1	2	<5	<5	51.9

METHOD : A7/1, A1/2, X2

Refer to this map as:—
20/4

BARWOLLA
NORTHERN TERRITORY

R. F. 1:100 000
MINING TENURE



GRATICULAR SECTION REFERENCE

TO GIVE A REFERENCE TO A GRATICULAR SECTION BEING ONE MINUTE OF LONGITUDE BY ONE MINUTE OF LATITUDE			
SAMPLE SECTION: SE CORNER BLOCK			
1. Quote this 1:100 000 sheet number	20/4		
2. Quote the number above and in the centre of the one minute column		40	
3. Quote the number to the left and in the centre of the one minute row			70
SAMPLE REFERENCE	20/4	40	70

PRODUCED by the Department of Mines and Energy, Darwin, using base mapping provided by the Division of National Mapping.

NOTE TO MAP USERS: Mining Tenements on this map are plotted from descriptions supplied by the holders and the Northern Territory takes no responsibility as to their accuracy.

HORIZONTAL DATUM: AUSTRALIAN GEODETIC DATUM 1966
VERTICAL DATUM: AUSTRALIAN HEIGHT DATUM
TRANSVERSE MERCATOR PROJECTION

SCALE 1 : 100 000

Kilometres 2 1 0 2 4 6 8 10 12 Kilometres

FULL LATITUDE AND LONGITUDE VALUES ARE SHOWN AT THE SHEET CORNERS, WITH EVERY 10' VALUE BEING LABELLED AROUND THE NEATLINE. 10 000 METRE INTERVALS OF THE UNIVERSAL TRANSVERSE MERCATOR GRID, ZONE 52 (AUSTRALIAN MAP GRID) ARE ALSO SHOWN EXTERNALLY.

TN MN
3.48°
MAGNETIC DECLINATION
Correct 1970
Annual Change Negligible

- Built-up area; National route marker
- Principal road and highway; Cutting
- Secondary road; Embankment
- Minor road; Road bridge
- Vehicular track
- Gate; Cattle grid
- Railway; Station; Railway bridge
- Power transmission line; Fence
- Mine; Windmill; Yard; Quarry
- Building; Church; Ruins
- Trig station; Bench mark; Contour with value

- Aboriginal Land Claim Boundary
- Exploration Licence (application) ..... A
- Exploration Licence (granted) ..... EL
- Mining Reserve ..... RO or MR
- Business Area ..... BA
- Dredging Claim ..... DC
- Exploration Retention Lease ..... ERL
- Extractive Mineral Lease ..... EML
- Extractive Mineral Permit ..... EMP
- Garden Area ..... GA
- Gold Mining Lease ..... GML

- Licence to treat tailings ..... LTT
- Machinery Area ..... MA
- Machinery Lease ..... Mach. L
- Mineral Claim ..... MC
- Mineral Lease (Northern) ..... MLN
- Tenement number ML94
- Prospecting Area ..... PA
- Quarry Area ..... QA
- Residence Area ..... RA
- Residence Lease ..... RL
- Water Right ..... WR

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Moyle 19/3	Wingate Mountains 20/1	Jinduckin 20/2
Fitzmaurice 19/6	Barwolla 20/4	Flora 20/5
Mount Mon Mir 25/3	Ikymbon 26/1	Hogarth 26/2

NATIONAL 1:100 000 SERIES SHEET No. 5068
PART OF 1:250 000 SHEET
FERGUSSON RIVER SD 52-12

1:100 000 MINING TENURE
NORTHERN MINERAL FIELD

BARWOLLA
Refer to this map as:—
20/4

CR88/119

GEOLOGICAL MAP OF PROSPECT AREA