Open File Envelope No. 9532

EL 2522

WALLAROO

FINAL REPORT FOR THE PERIOD 16/6/98 TO 15/6/99

Submitted by

P.S. and G.F. Forwood Pty Ltd
1999

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SUMMARY REPORT ON MINERAL EXPLORATION

(Separate form for each licence)

Exploration Licence No: 2522

For Six Months Ending: 15 Jun '99
Mineral(s) sought: Cu,Au

Operator/Manager: P.S.Forwood
Prepared by: P.S.Forwood
Date: 18 May '99
Phone no: 03-98175692
Fax No: 03-98173464
E-mail gforwood@melbpc.org.au

SUMMARY OF OPERATIONS

(No, type of samples; line km & type of survey; No of holes, meters of each type of drilling; Environmental activities; etc)

Further studies of the aeromagnetic contour plan led to the conclusion that the large feature of a low surrounded by a ring of highs situated 6 km offshore from Warburto Point is the best target for drilling. The current detailed TEISA survey will refine the nature of this feature.

No field work was carried out.

Further refusals were received from companies approached for farm-outs, and decisions were made, firstly to not participate in the forthcoming TEISA aeromagnetic survey of the Spencer Gulf area. Later, when renewal of EL 2522 was due, it was decided to allow the licence to lapse, since the licencee projected that it is likely to be 3 —4 years before major exploration companies become sufficiently aggressive again to want to farm in to such a project.

EL 2522 therefore expired on 15 June 1999. A written report with farm-out review appended was prepared for PIRSA records.

[If field activity undertaken, attach A4 size plan showing general location and type of work done]

EXPENDITURE

Expenditure for period: (1 Jan '99 to 30 June '99) $1,600.00 (See attached spreadsheet)
(add detailed statement)

Total Expenditure for Licence: (to 30 June '99) $12,988.37

Wallaroo EL2522 Costs

		[1]	[2]	[3]	[4]	[5]	[6]	[8]	[9]	[10]	[11]	[12]	[13]	[7]		[14]
Date	Man-	Salaries	Hire:-	Lease fees	'phone(T)	Draftg(D)	Stores	Accommo-	Assays	Land-	Wages	Contractors	Bond:-	Mileage @	km	TOTALS
|	days	|	Office (O)	|	Fax (F)	Maps (M)	fares	dation(A)	|	-owner	incl.WCI	&	Deposits(D)	$0.52	logged	|
|	|	|	Equipment(H)	|	Post (P)	Photos(P)	Services	Camp	|	compen-	|	Sundry	Charges(C)	$ per km:later	|	|
|	|	|	|	|	Copys(C)	Typing(T)	|	costs(C)	|	-sation	|	|	|	$0.55	|	|
June 99 Tot	1	$400.00	$200.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	0	$600.00
Jan-June Tot	1	$400.00	$1,200.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	0	$1,600.00
Incep-June 99	16	$6,400.00	$4,600.00	$175.00	$37.50	$50.30	$725.79	$0.00	$56.40	$0.00	$0.00	$200.00	$0.00	$743.38	1364	$12,988.37

END OF LICENCE

Continuous Excel spreadsheet of exploration costs

P.S.& G.F.FORWOOD PTY LTD
Address: 22 Barnsbury Rd., Balwyn, Vic. 3103, Australia
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E-mail *gforwood@melbpc.org.au*

Friday 9th July, 1999

The Director-General,
Minerals Dept, PIRSA,
PO Box 1671,
Adelaide, S.A. 5001

Dear Sir,

E.L. 2522 (Wallaroo) - Final Report (for open file)

Please find attached two copies of our final report on the above licence.

Yours faithfully,

P.S.Forwood (Licensee)

Attachments 2 copies of Final Report on EL 2522 by P.S.Forwood (for Licensee)

Copy of farm-out review **"EL 2522, Offshore from the Moonta-Wallaroo Copper-Gold field, South Australia", dated 24 Feb 1988**

The Summary sheet V3.93 is included with the report

E.L. 2522 WALLAROO S.A.

FINAL REPORT

(with expenditure Inception-- 30 June 1999)

by P.S.Forwood for P.S.& G.F.Forwood Pty Ltd (Licensee)

Contents

1.0 Summary & explanation of reporting

1.1 Licence and reporting history

EL 2522 of 198 square km was granted to P.S.& G.F.Forwood Pty Ltd on 16 June 1998. The licence was first granted for 6 months, and then extended for a further 6 months, until the licencee decided that the time-scale for obtaining a farm-in partner was too long, and allowed the licence to lapse on 15 June 1999. The licencee was required to indemnify the Minister for the clean-up of any pollution, and the retrieval of any shipwrecked any plant or equipment from the waters of the Gulf.
There were hearsay reports of large magnetic disturbances out in the Gulf, but as far as is known no previous exploration had been carried out in the area.

1.2 Summary of work carried out

Data for the early and by today's standards primitive BMR aeromagnetic survey (1974) were obtained and studied, together with the known onshore features of structure and mineralisation, particularly the Moonta and Wallaroo lodes.

An interpretation was made which focussed on several offshore features in near-shore shallow water.

Sea floor depths and offshore drilling technology were investigated and cost estimates were assembled.

From this a review entitled "EL 2522, Offshore from the Moonta-Wallaroo Copper-Gold field, South Australia" was prepared. This identified several anomalous offshore features which are likely to relate to copper or copper-gold mineralisation. Copy of this review with any up-dates is annexed to this final report on EL 2522.

A submission was made to PIRSA to have the general offshore area highlighted by this licence included in the 1999 TEISA aeromagnetic survey.

Meanwhile, it was recognized that the cost of the initial 'field' program ($315,000) would require a joint venture partner, hence approaches were made to exploration companies thought to have the 'firepower' and interest to undertake such a program.

In November 1998 an arrangement was entered into with Whitehorse Geoscience Pty Ltd of Melbourne to expand the search for a joint venture partner.

An application for extension of the licence for a second 6 month period was successful.

For the initial part of the second and final six months of the licence, efforts were continued to find a farm-in partner. The following is a list of companies that have been approached.
Aberfoyle Exploration
BHP

Cyprus Gold Australia
Geo2 Limited
Lachlan Resources
Lion Selection Group Ltd
Mining Project Investors
M.I.M.Exploration Pty Ltd
Minorco
Newcrest Mining Limited
Normandy Exploration Ltd
North Limited
Pasminco
Phelps Dodge Australasia (Inc)
Placer Exploration limited
Renison Gold Fields
Rio Tinto Ltd
Savage Resources Ltd
Werrie Gold
WMC Limited

In all cases the approach was either declined or ignored.

No field work was carried out in EL 2522.

2.0 Geology

The basement for the area is certain to be Moonta Meso-Proterozoic meta-sediments and met-volcanics plus acid intrusives, well known from drill cores but infrequently seen in outcrop. They are believed to be Carpentarian, equivalent to the Olary rocks 250 km to the north-east, and to basement rocks of the Roxby Downs area, 390 km to the north.
Information on the geology and structure is obtained by projecting from the known onshore geology of the Moonta-Wallaroo district, with which the aeromagnetic pattern shows an undeniable continuity. Locally onshore, and on Bird Island Reef, the Emeroo Quartzite of the Adelaidean unconformably overlies the Carpentarian, while again unconformably above the Adelaidean are isolated 'basins' of relatively flat-lying Cambrian sediments.
Onshore this is a usually topped by thin Quaternary cover, which may also occur offshore but is less likely. A variable 'skin' of seabed mud can be expected.
Details of the rocks and structure of Moonta are set in context in the comprehensively reported work of Conor of MESA.

3.0 Geophysics

3.1 Airborne magnetics

Aeromagnetics is the essential tool for EL 2522. Data from the 1974 BMR survey was obtained and examined. Major features are revealed which relate to the Meso-Proterozoic, and confirm the continuity of these onshore rocks into the offshore area. Of particular note is the WSW-trending 'Alford' mineralised belt; it continues for another 30 km into the sea, through Wallaroo Bay and beyond (although by running partly parallel to the shore it does not reach more than 15 km from land).
A strong magnetic feature occurs in Wallaroo Bay, and is considered a drilling target. However, the most attractive feature is at the far seaward end of the trend. Here we see a magnetic low virtually encircled by magnetic highs. The overall complex is about 5 km in diameter, and the maximum magnetic differential between crest and trough is about 5,000 nTs. The new PIRSA/TEISA aeromagnetic survey being flown in June 1999 at 80 MTC and 400m line-spacing, with GPS tracking, will refine this feature. If it is confirmed as described above, it will be an exciting target for the future.

4.0 Drilling

Five vertical diamond drill holes were proposed for the licence, to be drilled from an offshore platform. The cost of these holes was estimated at $275,000, chiefly in hiring and towing the platform. The proposed drilling was not attempted.

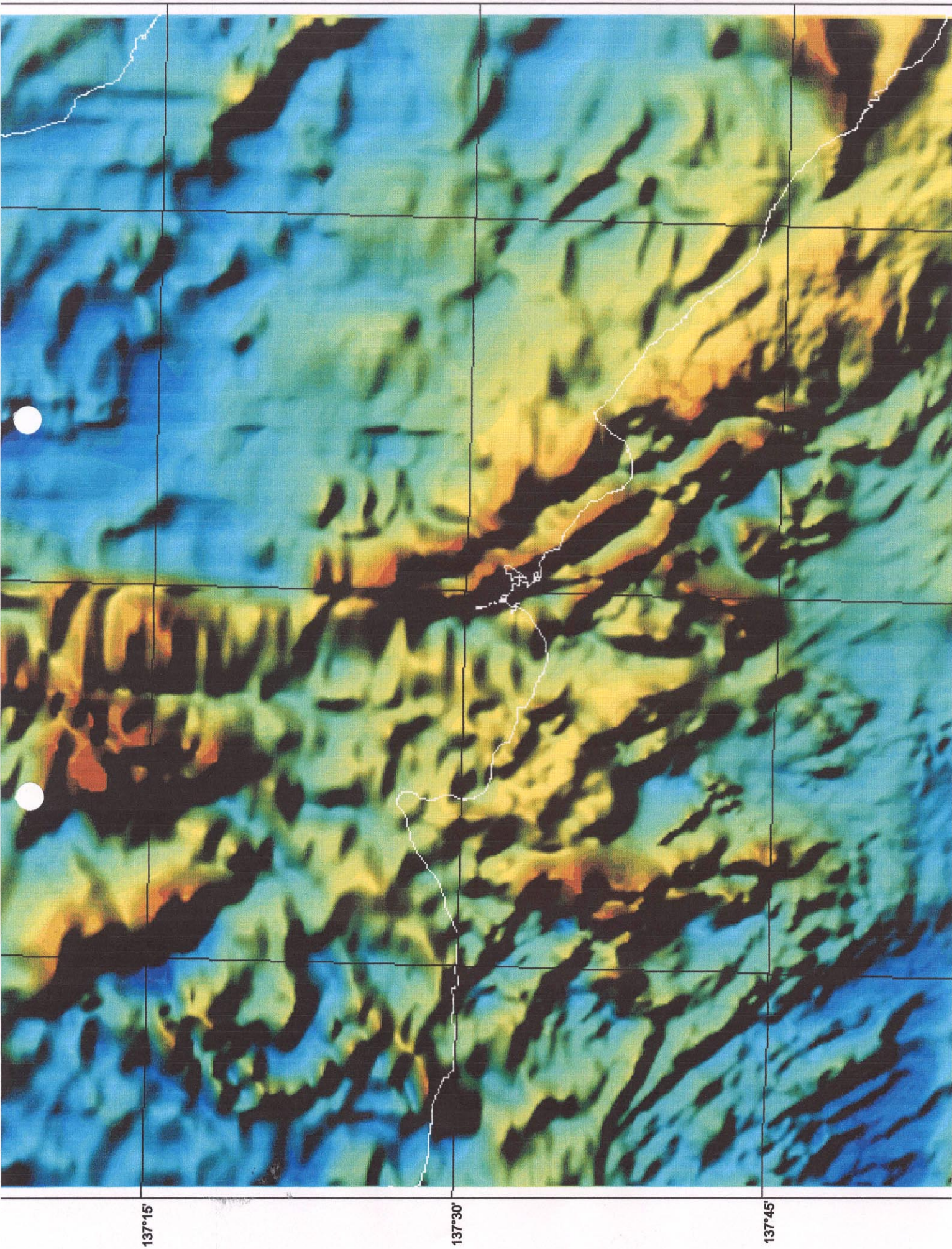
5.0 Outlook

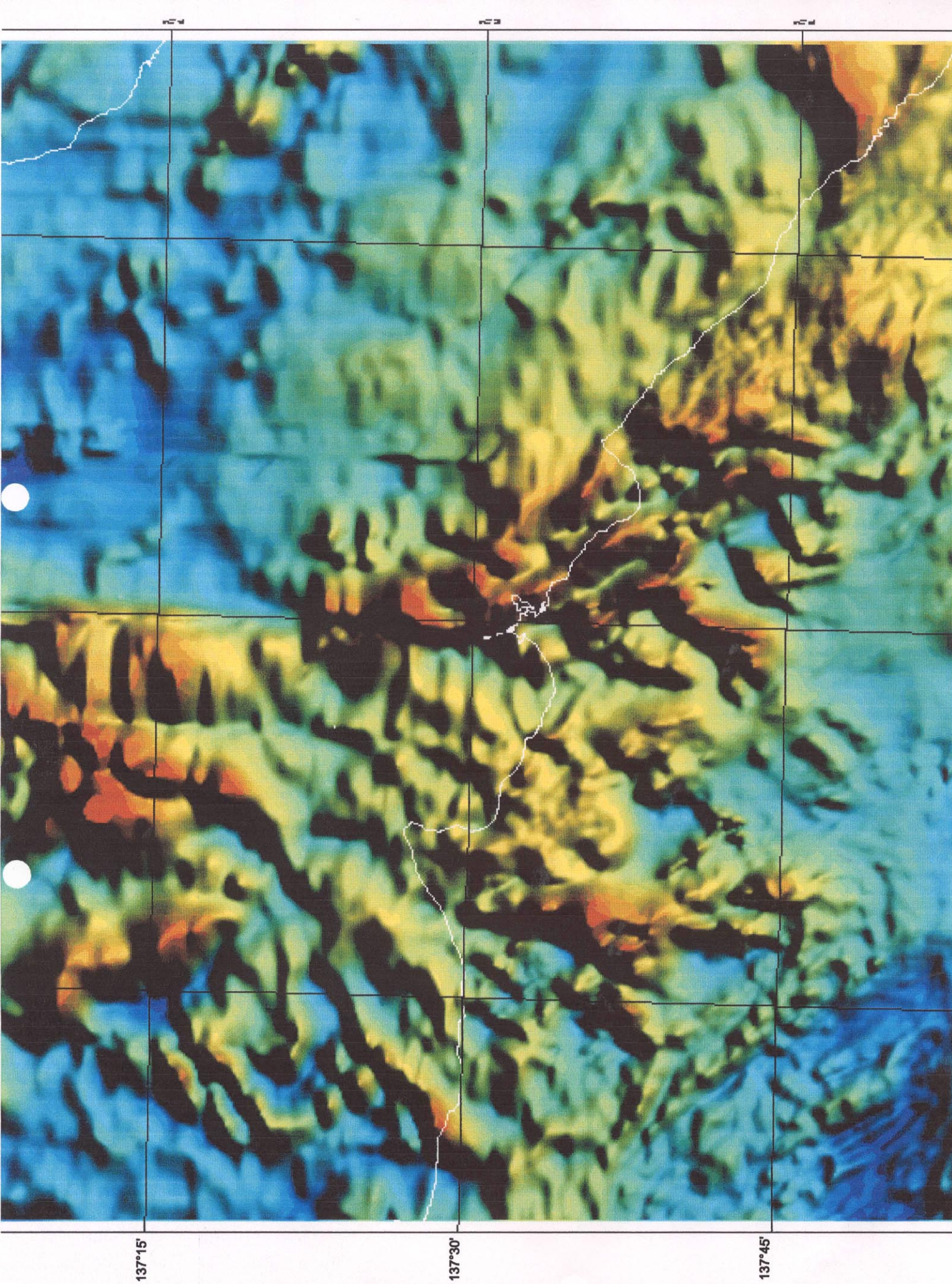
The exploration of this difficult but highly potential area must await a more aggressive exploration era.

6.0 Attachment

Farm-out review entitled
"**EL 2522, Offshore from the Moonta-Wallaroo Copper-Gold field, South Australia", dated 24 Feb 1988**

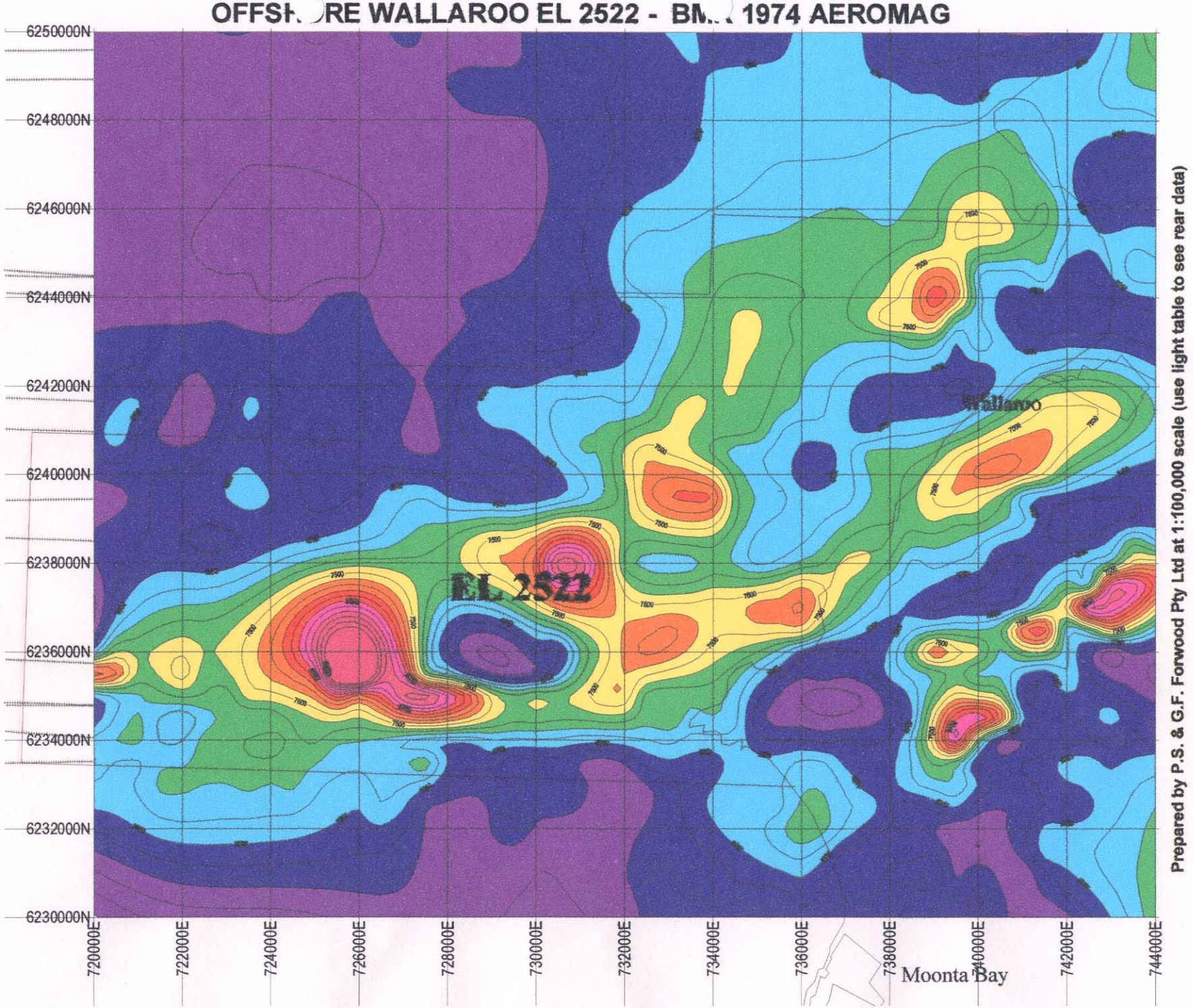
BMR 1974 AEROMAGNETICS, OFFSHORE WALLAROO, VIEW FROM NW





BMR 1974 AEROMAGNETICS, OFFSHORE WALLAROO, VIEW FROM NE

Figure W3


OFFSHORE WALLAROO EL 2522 - BMR 1974 AEROMAG
6250000N
6248000N
6246000N
6244000N
6242000N
6240000N
6238000N
6236000N
6234000N
6232000N
6230000N
720000E
722000E
724000E
726000E
728000E
730000E
732000E
734000E
736000E
738000E
740000E
742000E
744000E
EL 2522
Wallaroo
Moonta Bay
Prepared by P.S. & G.F. Forwood Pty Ltd at 1:100,000 scale (use light table to see rear data)

Review of Exploration Licence 2522 SA

(Offshore Wallaroo)

and the copper potential of the area

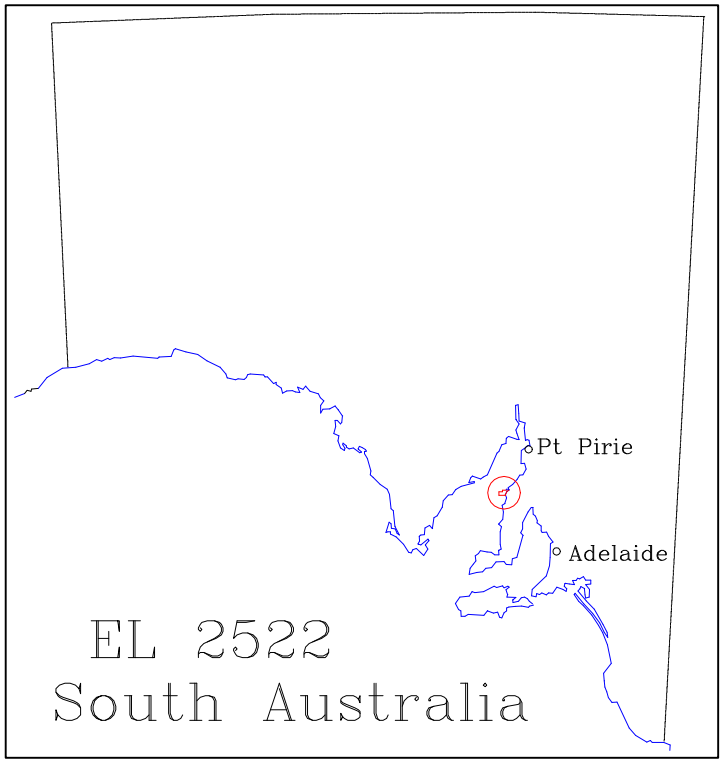
For prospective farminees

Prepared in June 1998 by P S Forwood

EL 2522, Offshore from the Moonta-Wallaroo Copper-Gold field, South Australia

Location

EL 2522 is in South Australia, immediately adjacent to the Moonta Copper Field, and offshore from the port of Wallaroo. It occupies 198 sq km of the shallow water of Spencer Gulf, which was (with other gulfs etc) proclaimed "mineral land" on 3 July 1972. Geographically, it is about 160 km by road north-west of Adelaide (see attached geographic plan, scale 1:100,000)



Geology

The important rocks of the Moonta-Wallaroo mineral field are acid and (lesser) basic volcanics now dated at about 1740 - 1750 Ma. These are associated with dominantly chemical sediments including BIFs, and some (usually fine-grained) terrigenous metasediments, now extensively metasomatised. All are wedged between the intrusive Tickera granite to the north, and Arthurton granite to the south, the granites being dated at about 1590 Ma.

Thin 'outliers' and very shallow basins of Upper Proterozoic (Adelaidean) and Cambrian occur, but 0all are hidden beneath a thin veneer of Quaternary with subsoil kunkar. There is only a thin strip of basement exposure along the sea-front north of Wallaroo (mainly granitic variations) and a rare outcrop of calc-silicate metasomatite at Hill's quarry closely east of Wallaroo.

A great deal of geological effort, by many individuals, has been put into the Moonta-Wallaroo district; the most comprehensive and up-to-date collation of the findings is that by C H H Conor (1994) "An interpretation of the geology of the Maitland and Wallaroo 1:100,000 sheet areas" *Mines and Energy South Australia Envelope DME 588/9*3 (unpublished).

The "wedge" of volcanically and metasomatically active 'Carpentarian' rocks changes going east, broadening and becoming less exciting until the Bute area is reached, where acid volcanics (and copper) reappear. However, going west, the volcanic-rich, metasomatically active, and highly mineralised 'wedge' is cut off by Spencer Gulf.

Spencer Gulf is a shallow generally N-S trending gulf, about 40 km wide and at most 30 metres deep, in this area.

The BMR flew a regional aeromagnetic survey over the whole area in 1974. The resulting contour plan shows an area of 'angry' magnetics over the Moonta-Wallaroo district, and extending out to sea. This is believed to represent a "red rock" province, that is an area containing old volcanic rocks with magnetite and generally enriched in a fine 'dusting' of iron oxides, particularly hematite, which gives the rocks their orange or pink coloration. The extent of this 'angry' magnetic terrain can be seen on the attached coloured TIF images, scale approx 1:500,000, one viewing the magnetics from the NE and the other from the NW.

From this it is clear that the Moonta-Wallaroo geology continues at least as far west out to sea as it does on-shore, ie about 20 km (and possibly 40 km). However, whilst similar age rocks occur on land on the west side of the Gulf 75 km away, the exciting volcanic-rich, highly-metasomatised, copper-rich rocks have gone.

Thin selvages of Cambrian occur on the coast immediately south of Wallaroo, and Emeroo quartzite of the Adelaidean (upper Proterozoic) outcrops on Bird Reef. It is possible that a few metres of this material would be encountered in drilling in the Gulf.

The structural features of the area have been studied, and the obvious general direction of stratigraphic continuity confirmed, that is, trending SW-NE. However, the magnetic image of the district shows an equally obvious NW-SE direction (in fact, closer to 122°, which is O'Driscoll's WNW or 2A direction).

The lodes of the area also demonstrate these two structural directions. The Wallaroo lodes near Kadina both strike, and line up, in the WNW-ESE (=2A) direction, while the Moonta lodes strike SW-NE. However, the Moonta lodes tend to "stack" in a NW-SE direction.

The TIF images of the BMR regional aeromagnetics show these structural directions well. In particular, the NE TIF image (viewing from the NE) shows the 2A direction as very strong features. (Use the light table to superimpose the licence outline drafted on the rear of the coloured image.)

The corridors that correspond with the Wallaroo Lodes trend, and with the Moonta Mines "stacking", intersect the important mineralised Alford-Wallaroo corridor offshore, to give the targets described later.

Mineralisation

Copper and gold are the major metals of the Moonta-Wallaroo district. Molybdenum, silver and uranium recur, but in minor amounts. Lead–zinc features east of Kadina, but this is outside the Moonta-Wallaroo field proper, and the host rocks are thought by some to belong to different stratigraphy.

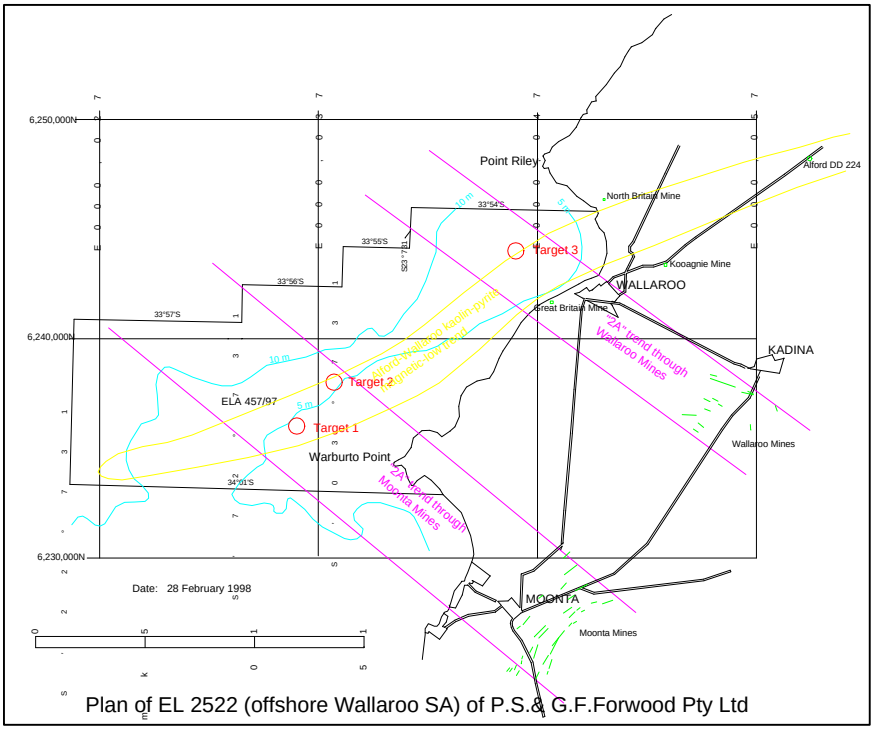
Copper-gold mineralisation is hosted by a variety of rock-types, but the productive mines occurred in either basic schist, or porphyry (= acid volcanics). However, the common feature is that the lodes were structurally controlled — filling fractures or fissures, with wall-rock alteration. The Poona and Wheal Hughes lodes, worked mainly as open cuts between 1987 and 1993, are still accessible (by arrangement), and good descriptions have been recorded by Conor and others.

While more than 20 individual lodes were worked in the district, they were all relatively narrow; Taylor's (Elder's) lode in the porphyry at Moonta varied from 3 to 8 metres in width. Consequently the field has a modest total production of about 400,000 tonnes of copper metal.

The writer has been associated with exploration in the district for most of the last 35 years, and believes that if the Quaternary cover had been absent, and the basement rocks had outcropped (as say at Broken Hill or Mt Isa) there would be a myriad of small prospector-type copper and gold workings, and possibly 3 or 4 additional productive lodes.

However, as far as exploration for major deposits go, there has been a huge amount of work done, and it is very much a case of diminishing returns. That is, *as far as the onshore part of the field goes*.

The best signs of wide, extensive mineralisation are at Alford/North Kadina. The results of DDH's 129 & 224 were mentioned in an earlier note (hole no 129 intersected 25m @ 0.17% Mo and separately 33.5m @ 0.21% Mo, while hole no 224 intersected 244 m @ 0.126% Cu with scattered Mo values in a more-or-less unfinished section). Equally important is the huge belt of kaolin ± pyrite alteration in which this mineralisation occurs. The belt fizzles out to the east, but is seen continuing strongly west on the beach north of Wallaroo. Notice the old copper shows of North Britain, Great Britain, and Kooagnie clustered near the coast in this vicinity.



Plan of EL 2522 (offshore Wallaroo SA) of P.S.& G.F.Forwood Pty Ltd

Targets

Very definitely, the area immediately west of the Moonta-Wallaroo coastline would have been exhaustively explored before today regardless of targets,

but for the water.

The water of the Gulf places a challenge of enterprise and technology on the exploration phase (which one progressive company has already shown can be overcome). But it also places a substantial minimum on the target body — the economic size and grade of which will depend on the distance offshore, and the depth of water.

Three targets for very major copper-gold deposits have been interpreted. These targets are essentially intersections of major structures with the Alford-Wallaroo kaolin ± pyrite alteration belt. Interestingly, these intersection loci are the sites of strong magnetic disturbances. Even more interesting is the particular magnetic disturbance at AMG 729000E 6236000N. Here a magnetic low about 3 km in diameter is virtually surrounded by a magnetic high ring. A drill hole to test this feature (target 1) would be 4½ km from land, and in less than 5 metres of water.

The other two targets are magnetic highs located at 730700E 6238000N (target 2), and at 739000E 6244000N (target 3). These are approximate AMG co-ordinates, all in Zone 53.

Together with the onshore lodes and important geological features, the targets are shown on the attached 1:200,000 geographic plan entitled "Plan of EL 2522 (offshore Wallaroo SA) of P.S.& G.F.Forwood Pty Ltd". Also, by placing the separate coloured aeromagnetic 1:100,000 scale contour plan on a light table, the targets drafted on the rear side will show through.

Practicalities

EL 2522 of 198 sq km was applied for on 16 July 1997, and was granted to P.S.& G.F.Forwood Pty Ltd on 16 June 1998, initially for a period of 6 months. All land within the licence is "mineral land" under the Mining Act (by proclamation which came into force on 3/7/72); the chief difference between this and an on-shore licence is the requirement of the Minister to be indemnified from any actions resulting from placing a structure on the sea-bed or the escape of deleterious substances into the sea.

Whereas the licence extends 16 km offshore, into water 13 metres deep, the 3 proposed targets are within 7 km of shore and in less than 7 metres of water.

Offshore drilling has recently been successfully carried out in the same region, 60 km or so to the north-east, aimed at a Roxby Downs target. Those holes were drilled at sites of similar distance from the shore, but some in deeper water (max 11m) and to much greater hole depth (up to 465m). The article on page 24 of MESA JOURNAL Volume 5, April 1997, describes that operation (copy attached).

The port of Wallaroo lies within the area, being 18 km from the furthest target.

In this part of South Australia, there is neither Native Title nor Native title claim over any of the area.

Budget Proposal

A straight-forward program of detailed low-level aeromagnetics, interpretation, and offshore drilling is proposed. The major cost is provision of the platform for drilling.

The inclusion of detailed low-level aeromagnetics is debatable, considering that the prime target is very large. However, it would allow the operator to better "come to grips" with the project, it insures against any serious positioning defects with the 1974 BMR results, and — as often happens when interesting or ambiguous drill results are obtained — more detail is subsequently called for. Detailed low-level aeromagnetics is expected to reveal the smaller target at 739000E 6244000N (in Wallaroo Bay) as a much more complicated feature.

Five holes are budgeted for three targets. This represents a conservative approach, and allows the operator to immediately follow up an interesting but inconclusive hole.

Detailed low-level aeromagnetics over 300 sq km	$20,000
Five 100m vertical diamond drill holes bored from a movable offshore platform, @ all-inclusive $55,000 each	$275,000
Admin, geology & interpretation, assays, onshore logistics, insurance	$20,000
Total	$315,000

Attachments:
(1) TIF image of 1974 BMR aeromagnetics (contours), viewed from NE, scale approx 1:500,000
(2) TIF image of 1974 BMR aeromagnetics (contours), viewed from NW, scale approx 1:500,000
(3) Fig W3: Surfer contours of 1974 BMR aeromagnetics over the general area of EL 2522, flown at 150m MTC, with irregular flight lines as shown, scale 100,000.
(4) MESA JOURNAL Volume 5, April 1997; refer to article on offshore drilling in SA on page 24 (photo reproduced below)

Items (1) – (3) are derived from digital data purchased from MESA

Jack-up platform on location in Spencer Gulf. (Photo 44504)