PRIMARY INDUSTRIES AND RESOURCES SA

**REPORT BOOK 98/00022**

# REVIEW OF OPEN FILE COMPANY EXPLORATION DATA YUNTA, WINNININNIE, ANABAMA, OAKVALE 1:100 000 MAP SHEETS, OLARY 1:250 000 MAP SHEET, FROM EARLY 1980'S TO MID-1997. SOUTH AUSTRALIA

by

WAYNE S. McCALLUM

**JULY 1997** **DME 182/93**

**CONTENTS** **PAGE**



**TABLES**



**SUMMARY OF EXPLORATION DATA** 39

| | |
|---|---|
| Car = Caroona | 6731 |
| Par = Paratoo | 6732 |
| Koo = Koonamore | 6733 |
| Mur = Murkaby | 6831 |
| Yun = **Yunta** | 6832 |
| Win = **Winnininnie** | 6833 |
| Cur = Curnamona | 6834 |
| Lil = Lilydale | 6931 |
| Ana = **Anabama** | 6932 |
| Ola = Olary | 6933 |
| Can = Canopus | 7031 |
| Oak = **Oakvale** | 7032 |
| Min = Mingary | 7033 |

**FIGURES**

**ACKNOWLEDGEMENT**:

Many of the plans in this report have been taken from Open File company reports, with little or no modification. Company logos have been left on the plans to indicate their source. MESA acknowledges the companies (and geologists) who compiled these plans.

**PRIMARY INDUSTRIES AND RESOURCES**
**SOUTH AUSTRALIA**

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# REVIEW OF OPEN FILE COMPANY EXPLORATION DATA YUNTA, WINNININNIE, ANABAMA, OAKVALE 1:100 000 MAP SHEETS, OLARY 1:250 000 MAP SHEET, FROM EARLY 1980'S TO MID-1997. SOUTH AUSTRALIA

WAYNE S. McCALLUM

**ABSTRACT**

**Based on Open File company exploration data released between the early 1980's and mid-1997, covering the area of the Yunta 6832, Winnininnie 6833, Anabama 6932, and Oakvale 7032 1:100 000 map sheets in the west and south of the OLARY 1:250 000 map sheet, significant exploration programs focused on:**

- **stratabound 'Telfer-style' gold in Adelaidean metasediments in the Nackara Arc, using either stratiform or stratabound structurally-controlled genetic models,**
- **structurally controlled gold and base metal mineralisation in Adelaidean metasediments to the north of the Anabama - Redan Fault Zone,**
- **with a lesser emphasis on:**
- **gold mineralisation related to alteration zones associated with the Anabama Granite,**
- **volcanic-hosted base metals in the Adelaidean Boucaut Volcanics to the north of the Anabama - Redan Fault Zone,**
- **syngenetic gold associated with Adelaidean Braemar Ironstone facies to the north of the Anabama - Redan Fault Zone,**
- **heavy mineral accumulations in Pliocene sediments (Parilla Sand and Loxton Sand) along the northern margin of the Tertiary Murray Basin,**
- **and diamonds associated with intrusive lamprophyric kimberlites, especially in the western Nackara Arc.**

**Many explorers noted similarities between the minor gold occurrences in the Nackara Arc, and the gold deposits at Telfer in WA, in particular stratiform and stratabound ferruginous Au-bearing sulphidic quartz veining in anticlinal cores in mildly metamorphosed Late Proterozoic metasediments. Early exploration focused on stratiform gold - especially along-strike extensions from known minor mineralisation. With recognition of significant structural controls at Telfer, later exploration focused on stratabound structurally-controlled gold. No significant discoveries were reported, but interesting to significant potential was indicated or remains untested at:**

- **Cu-Au in veins on local anticlines at Hill Grange/Agross Copper Mines (EL 1416 Bendigo Station, on ORROROO 1:250 000 map sheet)**
- **along strike extensions of Kirkeek's Treasure (EL 584 Mount Victor, EL 939 Mount Victor)**
- **Golden Sophia - Luron, low-grade but pervasive mineralisation (EL 1528 Giles Nob)**

**In many cases, regional gold exploration was accompanied by base metal exploration, and significant anomalism was indicated at:**

- **Cu-Zn at Echelon Grid and Gorge Grid, near Wadnaminga (EL 1102 Copperlinka)**
- **As/Sb/Zn/Cu/Pb at several localities on EL 1376 Hope Bank**
- **Zn-Pb-Ag at Mafeking (EL 1416 Bendigo Station, on ORROROO 1:250 000 map sheet)**

**Significant gold and/or base metal prospects indicated by exploration in Adelaidean metasediments and metavolcanics to the north of the Anabama - Redan Fault Zone, either structurally controlled or associated with alteration around Delamerian granites etc, included:**
**structurally controlled? (or stratabound?) Cu in quartz-limonite veining in schists and amphibolites at Anabama Copper Mine (EL 312, 508, 937 Cronje Dam, then EL 1462 Lilydale),**
**anomalous Cu(-Au) in Boucaut Volcanics at White Rock (EL 1462 Lilydale),**
**disseminated pyrite-chalcopyrite in schist at Two Brothers (EL 312, 508, 937 Cronje Dam),**
**pervasive slightly anomalous Cu-Zn at Division Dam / Anomaly F (EL 312, 508, 937 Cronje Dam),**
**anomalous Cu-Zn-Pb-Au, structurally controlled and related to alteration associated with granitic intrusion, in metasediments at Maldorky - Alderman's (EL 1611 Mutooroo Station).**

# INTRODUCTION

This review of Open File company exploration data covers part of OLARY 1:250 000 map sheet for data released in the period from the early 1980's up to mid 1997. The area comprises the four 1:100 000 map sheets in the south and west of OLARY:

- Yunta 6832,
- Winnininnie 6833,
- Anabama 6932,
- Oakvale 7032.

This area includes Neoproterozoic Adelaidean metasediments of the eastern portion of the Nackara Arc, bounded to the south by the east-northeast trending Anabama - Redan Fault Zone, separating exposed (or under shallow cover) Adelaidean metasediments and some Cambro-Ordovician granitoids to the north, from the Murray Basin to the south with Tertiary (marine) sediments overlying deeper Neoproterozoic and Palaeozoic rocks. Exploration is summarised for gold and base metal exploration in the Adelaidean metasediment of the Nackara Arc and adjacent to the Anabama Redan Fault and Delamerian granites, for diamonds in Mesozoic intrusives, heavy minerals in the Murray Basin sediments, and for industrial minerals.

Open File data includes data on Exploration Licences (ELs) that have been relinquished, surrendered, or allowed to lapse etc, but does not include exploration on ELs that are still current, or on ELs that were replaced for the same company or companies by subsequent ELs that are still current. Neither does it include data from Mineral Leases (MLs).

Company exploration in Palaeoproterozoic units of the Olary Domain in the northeast of OLARY, on the Olary 6833 and Mingary 7033 1:100 000 map sheets, up to 1991-92 was reviewed by Yates (1992), and updated to mid 1997 by McCallum (1997b). This area is dominated by Palaeoproterozoic Willyama Supergroup metasediments and granitoids of the Willyama Block, and exploration has focussed on Broken Hill-style base and precious metal mineralisation.

Because there is no congruity between either the 1:100 000 map sheet boundaries, or the tenement boundaries, or the geological separation between the Palaeoproterozoic Willyama Block and the Neoproterozoic Nackara Arc, this report includes data from exploration programs targeting Adelaidean metasediments on a number of tenements which overlap in part with Olary 6833 and Mingary 7033 1:100 000 map sheets. Specifically, these include:

- EL 530 Yardlowie - Mannahill — Yun, Win, Ana, Ola
- EL 1102 Copperlinka — Ana, Ola
- EL 1164 Mannahill — Ola, Win, Ana, Koo
- EL 1226 Teetulpa Goldfield — Win, Ola
- EL 1346, Mannahill — Win, Ola
- EL 1436 Mannahill — Yun, Win, Ana, Ola
- EL 1479 Copperlinka — Ola, Ana
- EL 1611 Mutooroo Station — Ana, Ola, Oak, Min
- EL 1657 Nilpena Hill — Ola, Min
- EL 1678 Devenborough Downs — Ana, Ola, Min
- EL 1782 Anabama Hill — Ana, Ola

Conversely, a number of tenements reported in McCallum 1997b are in part on Yunta, Winnininnie, or Anabama:

- EL 1233 Outalpa Hill — Win, Ola
- EL 1457 Kings Bluff — Win, Ola
- EL 1634 Outalpa — Win, Ola
- EL 1699 Footes Well — Win, Ola
- EL 1748 Crockers Well — Win, Cur, Ola, Kal
- EL 1750 Jackson Hill — Yun, Win, Ana, Ola
- EL 1926 Plumbago / Bimbowrie — Win, Cur, Ola

There was no data listed as released onto Open File in the *Mineral Industry Quarterly* series or the subsequent *MESA Journal* series for OLARY in 1995, reflecting more extensive exploration on tenements that were held for a longer period. Some data was released over the western portion of OLARY (the Nackara Arc) in 1996.

The following tenements were still Confidential / Current in mid 1997, and hence are not included in this review:

| | | |
|---|---|---|
| EL 1638 Oulnina Park | (due for release?) | Yunta |
| EL 1680 Oulnina Park | (due for release?) | Yunta |
| EL 1740 Oulnina Park | (due for release?) | Yunta |
| EL 1779 Oulnina Park | (due for release?) | Yunta |
| EL 1830 Anabama | (due for release?) | Anabama |
| EL 1979 Mount Victor | Winnininnie | |
| EL 2043 Wadnaminga Goldfield | (due for release?) | Anabama |
| EL 2059 Wadnaminga | (due for release?) | Anabama |
| EL 2084 Mount Victor | Winnininnie | |
| EL 2126 Teetulpa Goldfield | (due for release?) | Winnininnie |
| EL 2134 Morialpa | | Winnininnie |
| EL 2136 Cronje Dam | (due for release?) | Anabama |
| EL 2244 Oak Park | | Oakvale |
| EL 2277 Jubilee Dam | | Oakvale |

Exploration tenements granted on OLARY since 1981 (an arbitrary date; the earliest tenement reported herein is EL 1233, granted in 1984) are summarised in Table 1. EL summary data in this report (Table 1, and 'Summary Of Exploration Data') includes listings of previous and subsequent ELs over the same area; these lists are <u>not</u> comprehensive, as ELs are of varying shapes, and may overlap in whole, in part, or only minimally; even where there is significant overlap in tenement boundaries, the area of prior exploration may not overlap with the later tenement. ELs are listed where there has been significant overlap or significant prior exploration.

Digital data is available from MESA on CD ROM covering the OLARY 1: 250,000 map sheet, though focusing on the Palaeoproterozoic Willyama Supergroup metasediments and granites etc on Olary and Mingary 1:100 000 map sheets to the north of the present area of investigation:

- The OLARY DOMAIN CD ROM: comprises detailed outcrop geology for part of CURNAMONA and OLARY, magnetic, gravity and Landsat images, cultural features, drillholes, geochemistry, preliminary compilation of mineral occurrences, and land access data (cost AUS $1000, 80 Mb size)

- The CURNAMONA PROVINCE CD ROM includes a similar range of data including the Olary Domain, Broken Hill Block, Benagerie Ridge, Mount Painter areas within the Curnamona Province (cost AUS $500, 220 Mb size).

In addition to the data released to MESA by exploration companies as part of their tenement conditions, exploration companies are required to report significant developments to the Australian Stock Exchange (ASX), eg drillhole intersections that would affect share prices. The publicly accessible MINMET database comprises a compilation of company exploration data released to the ASX, and for the OLARY map sheet area excluding Mingary and Olary 1:100 000 map sheets includes data for:

| MINMET No | Prospect name | Tenement No | Company |
|---|---|---|---|
| 5987 | Anabama / Olary Cu prospect | EL 1830 | Placer Pacific Ltd Placer Dome Inc |
| 9659 | Ethiudna Au prospect, | EL 2258 | Equinox Resources NL |
| 69 | Ethiudna wollastonite prospect, company of Adelaide Chemical Co | EL 1593 | Golden Shamrock Mines Ltd, parent |
| 9354 | Lake Katherine wollastonite (Ethiudna) | ML 5780 | Minerals Corporation Ltd |
| 1431 | Oakvale mineral sands prospect Peregrine Resources | EL 1476, | Kerr McGee Australia Ltd EL 1510 |
| 9552 | Olary Au prospect | EL 2293 | Lynas Gold NL, |
| (Wadnaminga, Teetulpa, Waukaringa area)- EL 2299 Mawson Gold NL | | | |
| 8962 | Outalpa Au prospect | EL 2185 | Oxford Resources Ltd, Climax Mining Ltd |
| 5042 | Teetulpa alluvial project | ML 5443, ML 5471 | Cove Mining |
| 8498 | Wadnaminga Au prospect | EL 2059 | Gippsland Resources Australia NL |

These are held under current Exploration Licences (or ML).

Note: *Mannahill* is varyingly referred to in the literature as ‘Manna Hill’ or as ‘Mannahill’. Published maps (MESA geological maps and Department of Environment and Natural Resources topographic base plans etc) consistently refer to ‘Manna Hill’. However, MESA Exploration Licences were granted over ‘Mannahill’ (ELs 530, 1164, 1346, 1436) and ‘Mannahill Goldfield’ (ELs 363, 1161) - with the exception of ‘EL 1961 Yunta - Manna Hill’ - and company reports refer consistently to ‘Mannahill’. This latter terminology is adopted in this report.

## TABLE 1: OLARY 1: 250,000 MAP SHEET, EXPLORATION LICENCES GRANTED SINCE 1981

Key to 1:250 000 map sheets
OLR = OLARY
CRN = CURNAMONA
ORR = ORROROO
CHW = CHOWILLA
BRR = BURRA

Other abbreviations:
GF = Goldfield
HS = Homestead
Y-92 = Yates, 1992
Y&R-94 = Yates & Randell, 1994
M-97A = McCallum, 1997A (CURNAMONA 1:250 000 update)
M-97B = McCallum, 1997B (OLARY 1:250 000 update, Willyama Supergoup on Olary & Mingary 1:100 000 map sheets)
M-97C = McCallum, 1997C (this volume, OLARY 1:250 000, excluding Olary & Mingary 1:100 000 map sheets)

| TENEMENT | 1:250 000 map sheet | AREA sq km (reducing to) | PERIOD | FORMERLY | FOLLOWED BY | REPORTED IN | OPEN FILE ENVELOPE |
|---|---|---|---|---|---|---|---|
| ESSO EXPLORATION & PRODUCTION AUSTRALIA INC | | | | | | | |
| EL 848 Olary | OLR, CRN | 3155 | 20.07.81 - 19.07.83 | EL 263, 416, 450, 457, 767 | EL 1175 | Y-92 | 3447 |
| SELTRUST MINING CORPORATION PTY LTD | | | | | | | |
| EL 864 Peaked Hill | OLR | 501 | 27.07.81 - 26.07.83 | EL 141, 246, 274, 356, 555 | EL 1434 | Y-92 | 4244 |
| ESSO EXPLORATION & PRODUCTION AUSTRALIA INC, and JONES MINING NL | | | | | | | |
| EL 873 Pine Creek | OLR | 566 | 14.09.81 - 13.09.83 | EL 141, 246, 274, 356, 555 | - | Y-92 | 4514 |
| ASWAN PTY LTD | | | | | | | |
| EL 925 Weekeroo Hill | OLR | 363 | 16.11.81 - 08.07.82 | - | - | M-97C | |
| CARPENTARIA EXPLORATION PTY LTD | | | | | | | |
| EL 937 Cronje Dam | OLR | 563 | 30.11.81 - 29.11.84 | SML 282, 555, 556, EL 16, 173, 312, 508 | EL 1285, 1462, 1830, 2136 | M-97C | 3608, 3018 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| BARRIER EXPLORATION NL Name change to HELM CORPORATION LTD | | | | | | | | |
| EL 939 Mount Victor | OLR, ORR | 262 | | 30.11.81 - 29.11.86 | EL 584 | EL 1979, 2084 | M-97C | 4505 |
| UTAH DEVELOPMENT CO | | | | | | | | |
| EL 942 Mount Misery | ORR, OLR | 927 | (377) | 30.11.81 - 29.11.85 | SML 479, 635, EL 530, 584 | EL 1161, 1164, 1322, 1334, 1346, 1376, 1436 | M-97C | 9547, 6127 |
| CRA EXPLORATION PTY LTD | | | | | | | | |
| EL 1036 Oakbank | CHW, OLR | 2085 | | 07.09.82 - 20.06.83 | EL 660 | - | Y-92 | 5022 |
| MINES EXPLORATION PTY LTD, on behalf of Joint Venture with NORANDA AUSTRALIA LTD, NORTH BROKEN HILL LTD, ELECTROLYTIC ZINC CO OF AUSTRALASIA LTD Then NORANDA AUSTRALIA LTD | | | | | | | | |
| EL 1044, Mutooroo Mine | OLR | 24 | | 04.10.82 - 03.10.86 | SML 44, 52, 64, 79, 105, 150, 179, 285, 572, 698 EL 73, 208, 380, 650 | EL 1385, 1596 | Y-92 | 3872 |
| JARMAND MINERALS AND EXPLORATION PTY LTD | | | | | | | | |
| EL 1098 Teetulpa GF | OLR | 287 | | 07.01.83 - 06.01.84 | - | EL 1226, 1322, 1413, 1490, 2126 | M-97C | 5023 |
| UTAH DEVELOPMENT CO LTD | | | | | | | | |
| EL 1102 Copperlinka | OLR | 530 | (165) | 24.01.83 - 23.01.88 | - | EL 1479, 1711, 2185 | M-97C | 5020, 6292 |
| BHP MINERALS | | | | | | | | |
| EL 1137 Ballara | OLR | 87 | | 28.04.83 - 20.10.83 | - | - | Y-92 | 5158 |
| JARMAND MINERALS AND EXPLORATION PTY LTD | | | | | | | | |
| EL 1161 Mannahill | OLR | 174 | | 08.07.83 - 07.07.85 | SML 635, EL 363, 530, 942 | EL 1164, 1322, 1334, 1346, 1376, 1436, 1961, 2191 | M-97C | 5260 |
| , | | | | | | | | |
| UTAH DEVELOPMENT COMPANY LTD | | | | | | | | |
| EL 1163 Giles Knob | OLR | 200 | | 08.07.83 - 07.07.88 | SML 556 EL 16, 173 | EL 1528 | M-97C | 5215, 5644 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| AMAX AUSTRALIA (GOLD) PTY LTD | | | | | | | |
| EL 1164 Olary | OLR | 2365 | 08.07.83 - 27.11.84 | SML 635, EL 363, 530, 942, 1161 | EL 1322, 1334, 1346, 1376, 1961 | M-97C | 5211 |
| ESSO EXPLORATION AND PRODUCTION AUSTRALIA INC | | | | | | | |
| EL 1175 Olary | OLR | 1617 | 16.09.83 - 25.01.84 | EL 263, 450, 457, 848 | - | Y-92 | 3447 |
| AUSTRALIAN ORES AND MINERALS LTD | | | | | | | |
| EL 1189 Luxembourg Well | OLR | 207 | 04.11.83 - 03.11.84 | - | - | Y-92 | 5299 |
| OLARY GOLD PTY LTD | | | | | | | |
| EL 1220 MacDonald Hill | OLR | 131 | 24.02.84 - 23.02.86 | - | EL 1363, 1750, 1849, 1976 | Y-92 | 5586 |
| JARMAND MINERALS AND EXPLORATION PTY LTD Joint Venture with CSR | | | | | | | |
| EL 1226 Teetulpa GF | OLR | 287 | 02.04.84 - 01.04.85 | EL 1098 | EL 1322, 1413, 1490, 2126 | M-97C | 5023 |
| AMAX AUSTRALIA (OPERATIONS) PTY LTD | | | | | | | |
| EL 1229 Boiekevie Hill | OLR, CHW | 291 | 09.04.84 - 10.09.84 | - | - | M-97C | 5594 |
| KAISER ALUMINIUM AND CHEMICAL CORPORATION (AUST) LTD | | | | | | | |
| EL 1233 Outalpa Hill | OLR | 421 | 16.04.84 - 21.08.84 | - | EL 1261, 1388, 1507, 1634, 1748, 1849, 1854, 1926, 2185 | M-97B | |
| UTAH DEVELOPMENT COMPANY LTD | | | | | | | |
| EL 1234 Round Hill | OLR | 835 | 16.04.84 - 15.04.88 | EL 16, 173, 753 | EL 1838 | M-97C | 5644 |
| THE SHELL COMPANY OF AUSTRALIA LTD | | | | | | | |
| EL 1236 Cutana | OLR | 392 | 08.05.84 - 06.03.85 | - | EL 1363, 1752, 1772, 1976 | Y-92 | |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| ABERFOYLE EXPLORATION PTY LTD<br>Joint Venture with POSEIDON MINERALS LTD since October 1987 | | | | | | | | |
| EL 1244 Drew Hill | OLR | 625 | | 02.08.84 - 01.08.89 | - | EL 1616, 2031 | Still Confidential | |
| CRA EXPLORATION PTY LTD | | | | | | | | |
| EL 1249 Cottage Bore | BRR, ORR, CHW, OLR | 860 | | 24.09.84 - 25.06.86 | SML 706 | EL 1797 | M-97C | 5944 |
| UTAH DEVELOPMENT CO LTD | | | | | | | | |
| EL 1250 Nackara | OLR, ORR | 982 | (167) | 24.09.84 - 12.09.86 | - | - | M-97C | 5896, 6411 |
| ADELAIDE AND WALLAROO FERTILIZERS | | | | | | | | |
| EL 1257 Bimbowrie | OLR, CRN | 635 | | 05.11.84 - 04.11.85 | - | EL 1389, 1444, 1700 1748, 1847, 1926 | Y-92; Y&R-94 | 5884 |
| MOUNT ISA MINES LTD | | | | | | | | |
| EL 1258 Mingary | OLR, CRN | 1185 | | 13.11.84 - 12.11.89 | - | EL 1624, 2042, 2153 | Y&R-94 | |
| MICO AUSTRALIA NL | | | | | | | | |
| EL 1261 Outalpa Hill | OLR | 421 | | 16.11.84 - 15.11.86 | EL 1233 | EL 1388, 1507, 1634, 1854, 2185 | Y-92 | 5968 |
| ABERFOYLE EXPLORATION PTY LTD | | | | | | | | |
| EL 1262 Yerka Hill | OLR | 174 | | 03.12.84 - 02.12.85 | - | - | Y-92 | 5986 |
| AUSTRALIAN ANGLO AMERICAN SEARCHES PTY LTD | | | | | | | | |
| EL 1268 Tiverton HS | OLR, ORR | 1332 | | 11.01.85 - 10.01.86 | - | EL 1335 | M-97C | 6029 |
| CSR LTD | | | | | | | | |
| EL 1279 Manunda | OLR, ORR | 925 | | 20.03.85 - 20.06.85 | - | - | M-97C | 6340 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| THE SHELL COMPANY OF AUSTRALIA LTD | | | | | | | |
| EL 1285 Cronje Dam | OLR | 753 | 31.05.85 - Aug 85 | EL 16, 173, 312, 508, 937 | EL 1462, 1830, 1838, 2136 | M-97C | 6192 |
| THE SHELL COMPANY OF AUSTRALIA LTD | | | | | | | |
| EL 1286 Mutooroo | OLR | 775 | 31.05.85 - 21.08.85 | - | EL 1611, 1637, 1783, 2046 | Y-92 | 6307 |
| MINERAL ENGINEERING CONSULTANTS PTY LTD | | | | | | | |
| EL 1288 Olary | OLR | 218 | 18.06.85 - 17.12.85 | EL 848, 1164, 1175 | - | M-97B | |
| AUSTRALIAN ANGLO AMERICAN SEARCHES PTY LTD | | | | | | | |
| EL 1302 Winnininnie | OLR | 932 | 06.09.85 - 28.07.86 | - | - | Y-92 | 6489 |
| CRA EXPLORATION PTY LTD | | | | | | | |
| EL 1311 Levi Range | CHW, OLR | 437 | 02.12.85 - 25.06.86 | - | - | M-97C | 6504 |
| NEWMONT HOLDINGS PTY LTD | | | | | | | |
| EL 1321 Iron Peak | OLR | 734 | 12.03.86 - 11.03.87 | - | - | M-97C | 6556 |
| WESTERN MINING CORPORATION LTD | | | | | | | |
| EL 1322 Teetulpa GF | OLR | 726 | 24.03.86 - 23.03.87 | EL 363, 942, 1098, 1161, 1164, 1226 | EL 1376, 1413, 1436, 1490, 1961, 2126 | M-97C | 6711 |
| WESTERN MINING CORPORATION LTD | | | | | | | |
| EL 1334 Wattle Dam | OLR | 159 | 12.05.86 - 30.03.87 | EL 530, 942, 1161, 1164 | EL 1376, 1436, 1961 | M-97C | 6711 |
| AUSTRALIAN ANGLO AMERICAN SEARCHES PTY LTD | | | | | | | |
| EL 1335 Tiverton | OLR | 1332 | 28.05.86 - 28.07.86 | EL 1268 | - | M-97C | |
| WESTERN MINING CORPORATION LTD | | | | | | | |
| EL 1346 Mannahill GF | OLR | 267 | 29.07.86 - 30.03.87 | SML 635<br>EL 363, 530, 942, 1161, 1164 | EL 1376, 1436, 1961, 2191 | M-97C | 6711 |

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|---|---|---|---|---|---|---|---|
| WAVRIN HOLDINGS PTY LTD | | | | | | | |
| EL 1350 Kings Bluff | OLR | 589 | 20.08.86 - 19.08.87 | - | EL 1457 | Y-92 | 6793 |
| MOUNT ISA MINES LTD, CARPENTARIA GOLD PTY LTD Joint Venture with TARCOOLA GOLD LTD | | | | | | | |
| EL 1363 Cutana | OLR | 769 | 28.10.86 - 27.10.91 | SML 44, 105, 150, 179, 285A, 572, 207, 281, 420, EL 274, 356, 457, 555, 864, 873, 1220, 1236 | EL 1752, 1772, 1976 | M-97B part still Confidential | |
| CRA EXPLORATION PTY LTD | | | | | | | |
| EL 1376 Hope Bank | OLR, ORR | 1303 | 06.01.87 - 06.09.88 | SML 479, 635, EL 363, 584, 942, 1161, 1164, 1322, 1334, 1346 | EL 1436, 1961 | M-97C | 6819 |
| NORANDA AUSTRALIA LTD | | | | | | | |
| EL 1385 Mutooroo Mine | OLR | 23 | 02.03.87 - 01.03.88 | SML 44, 52, 64, 79, 105, 150, 179, 285, 572, 698 EL 73, 208, 380, 650, 1044 | EL 1596 | Y-92 | 6917 |
| MICO AUSTRALIA LTD | | | | | | | |
| EL 1388 Outalpa Hill | OLR | 421 | 02.03.87 - 01.03.88 | EL 1233, 1261 | EL 1507, 1634, 1854, 2185 | Y-92 | 5968 |
| ADELAIDE AND WALLAROO FERTILIZERS | Name change to TOP AUSTRALIA LTD | | | | | | |
| EL 1389 Bimbowrie | OLR, CRN | 635 | 02.03.87 - 01.03.89 | EL 1257 | EL 1444, 1700, 1748, 1847, 1926 | Y-92; Y&R-94 | 5884 |
| WAVRIN HOLDINGS PTY LTD | | | | | | | |
| EL 1395 Nillinghoo | OLR, ORR | 145 | 25.03.87 - 24.09.87 | EL 530, 584 | - | M-97C | 6876 |
| THE SHELL COMPANY OF AUSTRALIA LTD Joint Venture with TRI-ARC ENERGY LTD | | | | | | | |
| EL 1396 Benda Range | OLR, ORR | 1455 | 19.04.87 - 28.04.88 | - | - | M-97C | 6895 |

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|---|---|---|---|---|---|---|---|---|
| THOMDRILL PTY LTD | | | | | | | | |
| EL 1413 Teetulpa GF | OLR | 725 | | 17.07.87 - 16.01.88 | EL 1098, 1226, 1322 | EL 1490, 2126 | M-97C | 6935 |
| FAIRVIEW GOLD PTY LTD Joint Venture with AZTEC MINING CO LTD Bought by CRACOW RESOURCES LTD | | | | | | | | |
| EL 1416 Bendigo | CHW, OLR, ORR, BRR | 2553 | (1331) | 06.06.87 - 05.08.92 | SML 706, EL 517, 1249 | EL 1797 | M-97C | 6931, 8285 |
| BEDROCK MINING PTY LTD | | | | | | | | |
| EL 1430 Olary | OLR | 475 | | 14.09.87 - 13.09.89 | EL 848, 1164, 1175 | - | Y-92 | 6932 |
| BEDROCK MINING PTY LTD | | | | | | | | |
| EL 1434 Peaked Hill | OLR | 1096 | | 16.10.87 - 15.10.88 | EL 873, 1286 | EL 1611, 1637, 1977 | Y-92 | 6956 |
| HALLMARK GOLD NL | | | | | | | | |
| EL 1436 Mannahill | OLR | 1311 | (547) | 16.10.87 - 15.01.90 | SML 479, 635, EL 363, 584, 1161, 1164, 1322, 1334, 1346, 1376 | EL 1961, 2191 | M-97C | 6971 |
| HALLMARK GOLD NL | | | | | | | | |
| EL 1457 Kings Bluff | OLR | 589 | | 07.12.87 - 06.06.88 | EL 1350 | EL 1748, 1849, 1926 | M-97B | |
| CSR LTD, then PLACER EXPLORATION LTD | | | | | | | | |
| EL 1462 Lilydale | OLR, CHW | 1484 | | 05.01.88 - 04.01.93 | SML282, 555, 556 EL 16, 173, 312, 508, 937, 1285 | EL 1830, 1838, 2136 | M-97C | 8011 |
| MOUNT STREET SECURITIES, then YUNTA GOLD PTY LTD | | | | | | | | |
| EL 1470 Yunta | OLR, ORR | 1156 | | 01.03.88 - 31.05.90 | - | - | M-97C | 8049 |
| PEREGRINE RESOURCES (AUSTRALIA) PTY LTD | | | | | | | | |
| EL 1476 Oakvale | OLR, CHW | 1606 | | 28.03.88 - 27.03.89 | - | in part by EL 1612 | M-97C | 8005, 8261, 8059 |

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| BHP MINERALS LTD | | | | | | | | |
| EL 1479 Copperlinka | OLR | 165 | | 05.04.88 - 04.04.89 | EL 1102 | EL 1711, 2185 | M-97C | 5020 |
| COVE MINING NL | | | | | | | | |
| EL 1490 Teetulpa GF | OLR | 46 | | 20.05.88 - 19.11.88 | EL 1098, 1226, 1322, 1413 | EL 2126 | M-97C | |
| AMONA MINING & EXPLORATION PTY LTD, and K.R. FILSELL & SONS | | | | | | | | |
| EL 1507 Outalpa Hill | OLR | 58 | | 15.07.88 - 14.07.93 | - | EL 1634, 1854, 2036 | Still Confidential Due for release? | |
| PEREGRINE RESOURCES (AUST) NL | | | | | | | | |
| EL 1510 Quondong Vale | OLR, CHW | 1502 | | 02.09.88 - 01.03.89 | - | - | M-97C | 8059 |
| BATTLE MOUNTAIN (AUSTRALIA) INC | | | | | | | | |
| EL 1528 Giles Knob | OLR | 200 | | 12.10.88 - 21.12.89 | EL 1163 | - | M-97C | 8060 |
| ADELAIDE CHEMICAL COMPANY | | | | | | | | |
| EL 1593 Ethiudna Hill | OLR | 73 | | 18.07.89 - 17.07.90 | - | EL 2258 | M-97C | 8256 |
| MOONTA MINING NL, and A. MUIR | | | | | | | | |
| EL 1596 Mutooroo Mine | OLR | 23 | | 18.07.89 - 17.04.92 | SML 44, 52, 64, 79, 105, 150, 179, 285, 572, 698<br>EL 73, 208, 380, 650, 1044, 1385 | - | M-97B | |
| HELIX RESOURCES NL | | | | | | | | |
| EL 1606 Mundaerno Hill | CRN, OLR | 476 | | 18.08.89 - Jan 90 | SML 279, 415, 612, 694,<br>EL 121, 189, 457, 848 | EL 1676 | Y-92; Y&R-94 | |
| SOUTHERN VENTURES NL, DOMINION METALS PTY LTD | | | | | | | | |
| EL 1611 Mutooroo Stn | OLR | 1661 | (1127) | 11.09.89 - 06.09.94 | SML 44, 52, 64, 79, 105, 179, 263, 274, 285, 285A, 572, 698,<br>EL 73, 255, 274, 356, 555, 873, 1286, 1434 | EL 1637, 1832, 1977 | M-97C | 8226 |

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| PEREGRINE RESOURCES (AUSTRALIA) NL | | | | | | | | |
| EL 1612 Oakvale | OLR, CHW | 275 | | 11.09.89 - 10.09.90 | EL 1476 | - | M-97C | 8005 |
| ABERFOYLE RESOURCES LTD, and POSEIDON MINERALS LTD; later NORMANDY MINERALS LTD | | | | | | | | |
| EL 1616 Drew Hill | OLR | 625 | (343) | 04.10.89 - 03.10.94 | EL 457, 848, 1244 | EL 2031 | M-97B<br>part Still Confidential | |
| RESOLVE RESOURCES NL | | | | | | | | |
| EL 1619 Dlorah Downs | OLR | 624 | | 30.10.89 - 29.04.90 | - | - | M-97C | |
| MOUNT ISA MINES LTD | | | | | | | | |
| EL 1624 Mingary | OLR, CRN | 1185 | | 13.12.89 - 12.12.94 | SML 279, 415, 612,<br>EL 121, 189, 457, 848, 1258 | EL 2042, 2153 | Y&R-94<br>Still Confidential<br>Due for release? | |
| RESOLVE RESOURCES NL | | | | | | | | |
| EL 1634 Outalpa | OLR | 1094 | | 21.12.89 - 20.06.90 | - | EL 1700, 1854, 2185 | M-97C | |
| BHP MINERALS LTD | | | | | | | | |
| EL 1637 Mutooroo | OLR | 206 | | 05.01.90- 09.12.92 | SML 44, 52, 64, 79, 105, 179, 263, 274, 285, 285A, 572, 698, EL 73, 255, 274, 356, 555, 873, 1286, 1434,1611 | EL 1832, 1977 | M-97B | |
| PASSAIR PTY LTD | | | | | | | | |
| EL 1638 Oulnina Park | OLR | 162 | | 05.01.90 - 04.07.90 | - | EL 1680, 1740, 1779 | Still Confidential<br>Due for release? | |
| ABERFOYLE RESOURCES LTD | | | | | | | | |
| EL 1650 Schwier Dam | OLR, CHW | 1976 | | 28.03.90 - Jan 91 - | | - | Y-92 | 8310 |

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| AZTEC MINING COMPANY LTD | | | | | | | | |
| EL 1657 Nilpena Hill | OLR | 440 | (203) | 17.05.90 - 05.11.91 | - | - | M-97C | 8325 |
| ABERFOYLE RESOURCES LTD | | | | | | | | |
| EL 1664 Tietz Dam | OLR | 148 | | 20.06.90 - 19.06.91 | - | - | Y-92 | 8339 |
| ABERFOYLE RESOURCES LTD Un-relinquished portion still Confidential | | | | | | | | |
| EL 1676 Wompinie | OLR, CRN | 471 | (203) | 10.09.90 - 09.09.95 | SML 279, 415, 612, 694, EL 121, 189, 457, 848, 1606 | EL 2127 | Y&R-94, M-97A, M-97B | |
| SOUTHERN VENTURES LTD | | | | | | | | |
| EL 1678 Devenborough Downs | OLR | 686 | | 10.09.90 - 09.09.91 | - | - | M-97C | 8351 |
| PASSAIR PTY LTD | | | | | | | | |
| EL 1680 Oulnina Park | OLR | 324 | | 24.09.90 - 23.03.91 | EL 1638 | EL 1740, 1779 | Still Confidential Due for release? | |
| NEWCREST MINING LTD, NEWMONT AUSTRALIA LTD | | | | | | | | |
| EL 1685 Anabama Hill | OLR | 574 | | 12.11.90 - 11.11.91 | SML 262, 282, 556, EL 753 | EL 1782, 1830, 2101 | M-97C | 8348 |
| PLACER EXPLORATION LTD | | | | | | | | |
| EL 1699 Footes Well | OLR | 308 | | 14.02.91 - 05.10.93 | - | - | M-97B | |
| BHP MINERALS LTD | | | | | | | | |
| EL 1700 Bimbowrie Ck | OLR | 125 | | 14.02.91 - 12.10.92 | SML 419, EL 102, 450, 848, 1175, 1220, 1262, 1634 | EL 1847, 1849 | M-97B | |
| AZTEC MINING CO. LTD | | | | | | | | |
| EL 1711 Copperlinka | OLR | 493 | (104) | 16.04.91 - 15.04.92 | EL 1102, 1479 | EL 2185 | M-97C part still Confidential | 8698 |

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| AZTEC MINING CO. LTD<br>EL 1734 Arkarula | OLR | 473 | 22.07.91 -<br>21.07.92 | - | EL 1961 | M-97C | 8556 |
| PASSAIR PTY LTD<br>EL 1740 Oulnina Park | OLR | 324 | 06.08.91 -<br>05.02.92 | EL 1638, 1680 | EL 1779 | Still Confidential<br>Due for release? | |
| CRA EXPLORATION PTY LTD<br>EL 1748, Crockers Well | OLR, CRN | 1568 | 21.10.91 -<br>23.08.93 | SML 118,<br>EL 159, 263, 450, 848,<br>970, 1257, 1389, 1444, 1457 | EL 1849, 1926 | Y&R-94; M-97A, M-97B | |
| CRA EXPLORATION PTY LTD<br>EL 1750 Jackson Hill | OLR | 1384 | 11.11.91 -<br>10.08.93 | - | - | M-97B | |
| M.I.M. EXPLORATION PTY LTD<br>EL 1752 Cutana | OLR | 769 | 18.11.91 -<br>17/01/92 | SML 44, 105, 150, 179,<br>207, 281, 285A, 420, 572<br>EL 274, 356, 457, 555, 864,<br>873, 1220, 1236, 1363 | EL 1772, 1976 | M-97B<br>part still Confidential | |
| M.I.M. EXPLORATION PTY LTD<br>EL 1772 Cutana | OLR | 769 | 22.04.92 -<br>21.01.94 | SML 44, 105, 150, 179,<br>207, 281, 285A, 420, 572<br>EL 274, 356, 457, 555, 864,<br>873, 1220, 1236, 1363, 1752 | EL 1976 | M-97B<br>part still Confidential | |
| PASSAIR PTY LTD<br>EL 1779 Oulnina Park | OLR | 162 | 15.06.92 -<br>14.06.93 | EL 1638, 1680,<br>1740 | - | Still Confidential<br>Due for release? | |
| DOMINION METALS PTY LTD<br>EL 1782 Anabama Hill | OLR | 1135 | 27.07.92 -<br>31.08.94 | SML 262, 282, 556,<br>EL 753, 1685 | EL 2101 | M-97C | 8695 |

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| CRA EXPLORATION PTY LTD | | | | | | | |
| EL 1783 Mutooroo | OLR | 23 | 27.07.92 - 26.07.97 | EL 1286, 1611, 1637 | - | Still Confidential | |
| FAIRVIEW GOLD PTY LTD | | | | | | | |
| EL 1797 Bendigo | OLR, CHW, BRR, ORR | 1331 | 09.11.92 - 09.11.95 | SML 706, EL 517, 1249, 1416 | - | M-97C | 6931 |
| CRA EXPLORATION PTY LTD | | | | | | | |
| EL 1799 Melton | OLR, ORR | 1845 | 20.11.92 - 23.08.93 | - | - | M-97C | 8723 |
| MOUNT ISA MINES LTD | | | | | | | |
| EL 1810 Duffields Dam / Dingo Dam OLR | 301 | | 08.12.92 - 07.12.93 | - | EL 2046 | M-97B | |
| PLACER EXPLORATION LTD | | | | | | | |
| EL 1830 Anabama | OLR | 104 | 16.04.93 - 15.04.96 | SML 282, 555, 556<br>EL 16, 312, 508, 937, 1285, 1462 | EL 2136 | Still Confidential<br>Due for release? | |
| MOUNT ISA MINES LTD | | | | | | | |
| EL 1832 Dingo Dam | OLR | 206 | 30.04.93 - 22.10.93 | SML 44, 52, 64, 79, 105, 179, 263, 274, 285, 285A, 572, 698,<br>EL 73, 255, 274, 356, 555, 873, 1611, 1637 | EL 1976, 1977 | M-97B | |
| DOMINION GOLD OPERATIONS PTY LTD | | | | | | | |
| EL 1838 Lilydale | OLR | 487 | 12.07.93 - 11.07.94 | EL 16, 173, 312, 508, 937 1234, 1285, 1462 | EL 2101 | M-97C | |
| PEKO-WALLSEND OPERATIONS LTD, NORTH MINING LTD | | | | | | | |
| EL 1847 Bimbowrie Stn/Antro | OLR | 44 | 12.07.93 - 06.09.96 | EL 1257, 1389, 1700 | - | M-97B | |

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| PEKO-WALLSEND OPERATIONS LTD, NORTH MINING LTD | | | | | | | | |
| EL 1849 MacDonald Hill/Ameroo | OLR | 238 | | 12.07.93 - 11.07.97 | EL 1220, 1233, 1457, 1700, 1748 | - | M-97B | |
| AMONA MINING PTY LTD, and K.R. FILSELL AND SONS | | | | | | | | |
| EL 1854 Outalpa Hill | OLR | 58 | | 09.08.93 - 08.08.94 | EL 1507 | EL 2036 | Still Confidential Due for release? | |
| NORTH MINING LTD | | | | | | | | |
| EL 1926 Plumbago/Bimbowrie | OLR, CRN | 1151 | | 01.06.94 - 24.09.96 | EL 1233, 1257, 1389, 1700, 1748, | - | M-97A , M-97B | |
| ABERFOYLE RESOURCES LTD | | | | | | | | |
| EL 1938 Bulloo Ck | OLR | 174 | | 17.06.94 - 16.06.97 | - | - | Still Confidential | |
| EQUINOX RESOURCES NL | | | | | | | | |
| EL 1961 Yunta-Mannahill | OLR, ORR | 2147 | | 27.07.94 - 26.07.95 | SML 479, 484, 488, 635, EL 363, 584, 1161, 1164, 1322, 1334, 1346, 1376, 1436, 1734 | - | M-97C | 8970 |
| CRA EXPLORATION PTY LTD | | | | | | | | |
| EL 1973 Braemar | OLR, CHW | 660 | (334) | 01.08.94 - 31.07.96 | - | - | M-97C | |
| MOUNT ISA MINES LTD | | | | | | | | |
| EL 1976 Cutana | OLR | 485 | | 01.08.94 - 31.07.97 | SML 44, 105, 150, 179, 285A, 572, 207, 281, 420, EL 274, 356, 457, 555, 864, 873, 1220, 1236, 1363, 1752, 1772, 1832 | - | Still Confidential | |

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| NORTH MINING LTD | | | | | | |
| EL 1977 Mutooroo | OLR | ??? | 01.08.94 - 29.09.96 | SML 44, 52, 64, 79, 105, 150 179, 285, 285a, 572, 698, 263, 274 EL 73, 255, 274, 356, 555, 873, 1286, 1611, 1637, 1832 | - | M-97B |
| M. SELGA | | | | | | |
| EL 1979 Mount Victor | OLR | 189 | 01.08.94 - 31.1.95 | EL 939 | EL 2084 | Still Confidential |
| NORTH MINING LTD | | | | | | |
| EL 1987 Boolcoomata/Pimpena OLR | 282 | | 12.08.94 - 11.08.97 | - | - | M-97B |
| ABERFOYLE RESOURCES LTD, and NORMANDY MINERALS LTD | | | | | | |
| EL 2031 Drew Hill | OLR | 343 | 15.11.94 - 14.11.97 | EL 1244, 1616 | - | Still Confidential |
| EYRE RESOURCES NL | | | | | | |
| Transferred to K.R. FILSELL & SONS, and AMONA MINING & EXPLORATION | | | | | | |
| EL 2036 Walparuta | OLR | 191 | 06.12.94 - 05.12.96 | EL 1854 | - | Still Confidential Due for release? |
| MOUNT ISA MINES LTD | | | | | | |
| EL 2042 Mingary | OLR | 1185 | 30.12.94 - 27.02.96 | SML 279, 415, 612, EL 121, 189, 457, 848, 1258, 1624 | EL 2153 | Still Confidential |
| J. GLADDIS, L. DALLOW, D. LEWIS, G. BROWN | | | | | | |
| EL 2043 Wadnaminga GF | OLR | 43 | 30.12.94 - 29.06.96 | - | - | Still Confidential Due for release? |
| NORTH MINING LTD | | | | | | |
| EL 2046 Mutooroo/Duffields | OLR | 191 | 30.12.94 - 29.12.97 | EL 1286, 1611, 1637, 1810 | - | M-97B |

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| GIPPSLAND RESOURCES AUSTRALIA NL | | | | | | | |
| EL 2059 Wadnaminga | OLR | 770 | | 13.02.95 - 12.08.96 | - | - | Still Confidential Due for release? |
| M. SELGA | | | | | | | |
| EL 2084 Mount Victor | OLR | 189 | | 08.05.95 - 07.05.97 | EL 939, 1979 | - | Still Confidential |
| G.R. TURNER AND J.A. JONES | | | | | | | |
| EL 2101 Anabama Hill | OLR | 82 | | 29.08.95 - 28.08.96 | SML 262, 282, 556, EL 753, 1685, 1782, 1838 | - | M-97C 9107 |
| MINTECH RESOURCES PTY LTD | | | | | | | |
| EL 2126 Teetulpa GF | OLR | 522 | | 24.11.95 - 23.5.96 | EL 1098, 1226, 1322, 1413, 1490 | - | Still Confidential Due for release? |
| ABERFOYLE RESOURCES LTD, and NORMANDY MINERALS LTD | | | | | | | |
| EL 2127 Wompinie | OLR, CRN | 230 | | 24.11.95 - 23.11.97 | EL 1676 | - | Still Confidential |
| ROSSCRAFT MINERALS PTY LTD | | | | | | | |
| EL 2134 Morialpa | OLR | 78 | | 18.12.95 - 17.12.97 | - | - | Still Confidential |
| COPPERFIELD GOLD NL | | | | | | | |
| EL 2136 Cronje Dam | OLR | 448 | (176) | 18.12.95 - 17.12.96 | SML 282, 555, 556 EL 16, 173, 312, 508, 937 1285, 1462, 1830 | - | Still Confidential Due for release? |
| CRA EXPLORATION PTY LTD, and MOUNT ISA MINES LTD | | | | | | | |
| EL 2153 Mingary | OLR, CRN | 1205 | | 27.02.96 - 26.02.98 | SML 279, 415, 612, EL 121, 189, 457, 848, 1258, 1624, 2042 | - | Still Confidential |
| OXFORD RESOURCES PTY LTD | | | | | | | |
| EL 2185 Outalpa | OLR | 104 | | 07.06.96 - 06.06.97 | EL 1102, 1479, 1711 | - | Still Confidential |

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| NORSCOM PTY LTD | | | | | | |
| EL 2191 Mannahill | OLR | 1288 | 30.08.96 - 29.08.97 | EL 1161, 1346, 1436, 1961 | - | Still Confidential |
| BHP MINERALS PTY LTD | | | | | | |
| EL 2244 Oak Park | OLR, ORR | 809 | 10.12.96 - 09.12.97 | - | - | Still Confidential |
| PETROLEUM SECURITIES MINING CO LTD | | | | | | |
| EL 2246 Wiawera | OLR | 909 | 13.12.96 - 12.12.97 | - | - | Still Confidential |
| EQUINOX RESOURCES NL | | | | | | |
| EL 2258 Ethiudna | OLR, CRN | 1718 | 10.01.97 - 09.01.98 | EL 1593 | - | Still Confidential |
| MINOTAUR GOLD NL | | | | | | |
| EL 2264 Mutooroo | OLR | 481 | 16.01.97 - 15.01.98 | EL 1286, 1611, 1637 | - | Still Confidential |
| HAVILAH RESOURCES NL | | | | | | |
| EL 2277 Jubilee Dam | OLR | 985 | 04.03.97 - 03.03.98 | - | - | Still Confidential |

## EXPLORATION FROM THE EARLY 1980'S TO MID-1997

No work was undertaken, or no significant data was reported, for the following tenements:
EL 925 Weekeroo Hill
EL 1335 Tiverton
EL 1479 Copperlinka
EL 1490 Teetulpa Goldfield
EL 1612 Oakvale
EL 1619 Dlorah Downs
EL 1838 Lilydale

## I. NACKARA ARC

Tenements: EL 363 Mannahill Goldfield
EL 530 Yardlowie Mannahill
EL 584 Mount Victor
EL 939 Mount Victor
EL 942 Mount Misery
EL 1098 Teetulpa Goldfield
EL 1102 Copperlinka
EL 1161 Mannahill Goldfield
EL 1163 Giles Nob
EL 1164 Mannahill
EL 1226 Teetulpa Goldfield
EL 1229 Boiekevie Hill
EL 1234 Round Hill
EL 1250 Nackara
EL 1268 Tiverton Homestead
EL 1279 Manunda
EL 1322 Teetulpa Goldfield
EL 1334 Wattle Dam
EL 1346 Mannahill
EL 1376 Hope Bank
EL 1395 Nillinghoo
EL 1396 Benda Range
EL 1416 Bendigo Station
EL 1436 Mannahill
EL 1470 Yunta - Paratoo
EL 1528 Giles Nob
EL 1657 Nilpena Hill
EL 1678 Devenborough Downs
EL 1711 Copperlinka
EL 1961 Yunta - Mannahill

A dominant facet of exploration on OLARY in the period was exploration was for stratiform gold in Neoproterozoic Adelaidean metasediments of the Nackara Arc, an arcuate zone extending east-northeast from the main outcropping area of the Adelaide geosyncline towards the Palaeoproterozoic basement of the Olary Domain, the southern outcropping part of the cratonic Curnamona Province.

The main geological concept or model behind this exploration was the recognition of similarities between known (but minor) gold occurrences in the Nackara Arc, and the significant gold deposits at Telfer in Western Australia:

- stratiform and stratabound ferruginous quartz veins (± gold-pyrite-arsenopyrite-chalcopyrite-carbonate mineralisation) in anticlinal cores in mildly metamorphosed Late Proterozoic metasediments (Hallmark Gold NL, 1988).
- especially the presence of Au-bearing sulphidic quartz veining (P.J. Legge & Associates Pty Ltd).

Many companies listed their exploration as for 'Telfer-style', or stratiform, gold; explicitly or implicitly indicated that sedimentary controls were significant, for example Utah Development Co (later BHP) indicated for EL 942 Mount Misery that exploration was targeted at **chemically precipitated stratabound Telfer-style Au** in Tarcowie Siltstone / Cox Sandstone Member in the Waukaringa Syncline and Black Hill Anticline (Circosta, G., 1983). On EL 1321 Iron Peak, Newmont Holdings Pty Ltd proposed a model of syngenetic fine-grained stratabound Au deposited in basins during or soon after periods of basin subsidence and instability (Jones, D.G., 1987).

However, since the late 1970's, 'Telfer-style' has change meaning, now referring to predominantly structurally-controlled saddle reefs. For example, when referring to Telfer-style mineralisation in 1995, Equinox Resources indicate a model of structurally-controlled Au mineralisation, related to intrusion of younger granites, within host rocks comparable to the Nackara Arc (Parker, A.J., 1995). The significance of alteration associated with intrusion of younger granites was also noted by Placer Exploration on EL 1797 Bendigo, where exploration focussed on "Au - Cu mineralisation within structurally prepared hydrothermal sites proximal to oxidised Ordovician granitoids", eg the Bendigo Granite, analogous with "Telfer gold deposit where late Proterozoic granites are interpreted to source gold mineralisation hosted at anticlinal hinges within bedding-slip planes of variably calcareous metasediments" (Anderson, J (John), 1994). A recent reinterpretation of the genesis of Telfer style Au mineralisation, emphasising the role of granitoid heat sources driving fluids which scavenge Au, Cu and S at depth, is Rowins et al (1997; not sighted)

In this text, 'Telfer-style' is used where (and in the same sense as) the exploration companies used it,

and is clarified where necessary by 'stratiform', or 'structurally controlled', or 'saddle reef' etc.

Significant lithologies which have been a focus for exploration in the Nackara Arc include, from younger to older:

- the Tapley Hill Formation and overlying Tarcowie Siltstone Tarcowie Siltstone and Cox Sandstone Member (Farina Subgroup of Umberatana Group), with the prominent but laterally discontinuous Cox Sandstone Member at the contact, are host to mineralisation at Mannahill, Waukaringa, and Teetulpa Goldfields.
- Sturtian tillites and sedimentary iron formations towards the base of the Umberatana Group, including the Appila Tillite and Wilyerpa Formation (siltstone, feldspathic sandstone, minor conglomerate and diamictite), separated by a hiatus from the underlying Yudnamutana Subgroup, including the Benda Siltstone and Braemar Ironstone Facies, and Pualco Tillite. These are referred to informally as the 'lower glacials'.

- Saddleworth Formation (Burra Group), host to mineralisation at Nillinghoo Goldfield
- Mintaro Shale and Saddleworth Formation (Burra Group), host to mineralisation at Wadnaminga Goldfield

Morris and Horn (1990) reviewed the geology and gold mineralisation of the Nackara Arc, concluding that much of the gold is syngenetic, possibly eroded from Palaeoproterozoic Willyama Supergroup outcrop, remobilised into structurally favourable sites. They concluded that "the province hold potential for discovery of Telfer (stratabound, sandstone hosted), Witwatersrand (quartz pebble conglomerate), and Carlin (carbonate replacement) and possibly lamprophyric styles of gold mineralisation".

At **Mannahill Goldfield** (**EL 363 Mannahill Goldfield**), Au is associated with a stratiform zone of conformable veins of quartz ± carbonate ± barite ± pyrite or boxwork after pyrite, with blebs of pyrite disseminated in the host rock shale and siltstone. Detailed chip and channel sampling by Newmont Pty Ltd in 1977-78 indicated best values of 32 g/t Au at Homeward Bound and 20 g/t at Eudunda Hope with average grades of 4.3 g/t at Homeward Bound, 2.3 g/t at Elsie May, and 2.7 g/t at Westward Ho!. 25 percussion holes totalling 717m over the lode horizon indicated an extensive sub-horizontal stratiform lode from 0.5 to 1.5m thick, but with only patchy low grade gold (below open-cut grade). Lower grades in drilling than in surface sampling may reflect supergene enrichment.

In 1979-81, exploration by CRA Exploration Pty Ltd (**EL 530 Yardlowie Mannahill**) over the Winnininnie Dome, Paratoo Anticline, Waukaringa Syncline etc for 'Telfer-style' stratiform / stratabound Au in anticlinal closures - including at and along strike from **Mannahill** and **Wadnaminga Goldfields**, and **Waukaringa Goldfield** (on ORROROO 1:250 000 map sheet) - commenced with rock, soil, and auger sampling and costeaning. 1562 shallow auger holes at Winnininnie, Florina and Waukaringa Grids in early 1980 were followed in mid 1980 by 128 close-spaced bedrock auger holes totalling 402.3m at Florina Prospect, Nectar Mine and No Gammon (Mannahill Goldfield), and North and South Prospect (Wadnaminga Goldfield). In late 1980, 19 rotary percussion holes totalling 437m at Florina Prospect, Nectar Mine, No Gammon, and North and South Prospect intersected only minor anomalous Au.

On **EL 584 Mount Victor**, exploration by CRA Exploration Pty Ltd focussed on the along-strike potential for open-pittable Au at **Kirkeek's Treasure** (**Nillinghoo Goldfield**). 4 diamond holes totalling 373m beneath and along strike from the old workings, and 77 shallow RC percussion holes totalling 760.5m on 3 traverses indicated erratic and low gold values; however potential remains as only 500m of the 2000m strike extent of the potentially mineralised horizon at Kirkeek's Treasure was drilled (Mayer, T.E., December 1980).

From 1981-86, Barrier Exploration NL (later Helm Corporation Ltd) undertook extensive exploration over a broad domal structure around **Nillinghoo Goldfield** (**EL 939 Mount Victor**), noting similarities with Telfer - especially the presence of Au-bearing sulphidic quartz veining (P.J. Legge & Associates Pty Ltd, 1981). Exploration indicated an area of quartz stockwork veining 3.5 km southeast of Kirkeek's Treasure, as well as anomalous As, Cu and Ag along strike from Kirkeek's Treasure. In 1984, 12 angled RC percussion holes totalling 708m indicated anomalous Au along strike to the east from Kirkeek's Treasure (best results were 10m at 5.72 ppm Au, and 16m at 1.12 ppm Au). 43 follow-up RAB holes totalling 448m and 15 angled RC percussion holes totalling 778m indicated only patchy low-grade Au, and significantly downgraded the potential for large tonnage extensions to the mine.

In 1981-85, exploration on **EL 942 Mount Misery** by Utah Development Co (later The Broken Hill Proprietary Co Ltd) for stratabound Au in the Waukaringa Syncline and Black Hill Anticline, in particular along strike from **Waukaringa Goldfield** and **Ajax Mine** (on ORROROO 1:250 000 map sheet) included soil and rock-chip sampling traverses, stream sediment sampling, and auger traverses. 5 angled diamond holes totalling 2096.6m and 7 angled RC percussion holes returned disappointing results, though DDH MP005 intersected a number of exhalative? quartz-rich horizons in Tarcowie Siltstone on the northern limb of the Waukaringa Syncline. Having commenced with a sedimentary model for gold mineralisation, BHP concluded that Au was associated with discordant to concordant ferruginous quartz veining, especially in the anticlinal core, assumed to derive from Delamerian hydrothermal fluids.

From 1983-88, Utah / BHP targeted stratiform Au, initially along strike from historic workings, on EL 1102 Copperlinka, EL 1163 Giles Nob and EL 1234 Round Hill, (adjacent ELs extending from Wadnaminga south to Netley Hill and Anabama Hill), and on EL 1250 Nackara.

On **EL 1102 Copperlinka**, exploration along strike from **Wadnaminga Goldfield** and **Copperlinka Mine** included 3217 shallow RAB holes and 218 auger holes, followed by 5 diamond holes totalling 910.2m close to old workings. Mapping indicated a stratigraphic unit (informally named the 'Honeycomb Unit') containing a distinctive quartz stockwork in thin quartz-albite-dolomite interbeds in phyllitic siltstone. Gold results were disappointing, but low level Zn anomalism was noted at a number of locations, and the focus of exploration moved to base metals. Mapping and soil and rock sampling at Echelon Grid and Gorge Grid indicated minor anomalous base metals with best values of 930 ppm Cu, 1.48% Pb, 4000 ppm Zn at Echelon, and variable but low Au and base metals in the Lower Glacials at Gorge Grid. BHP - Utah noted the potential for large-scale placer Au deposits in the Lower Glacials, but undertook minimal follow-up.

On **EL 1163 Giles Nob**, mapping, sampling, and 517 shallow RAB holes and 683 auger holes were followed by 16 diamond holes totalling 731.2m near **Wadnaminga Goldfield** (**Thunder Queen**, **Victoria Tower**, **Oulnina Tower**) and **Taltabooka Goldfield** (**Cordierite Mine**, **Esmonde**, **Faugh-a-Ballagh**). Best results were 0.8m at 1.13 ppm Au, 1m at 2.31 ppm Au, and 3m at 0.5 ppm Au, in sulphidic veining at Taltabooka. The area was not upgraded by a follow-up traverse of 192 shallow RAB holes.

On **EL 1234 Round Hill**, including the southern part of Wadnaminga Goldfield and the northern limb of a regional syncline north of the Anabama - Redan Fault Zone, sampling at the old **Golden Stream Prospect** was followed by 1124 shallow RAB holes on 10 traverses, returning anomalous Au new the **Welsh Prince Mine**, and from zones of cross-cutting iron-rich veins near the Saddleworth Formation - Cradock Quartzite contact. Sampling and mapping of the Lower Glacials returned minor anomalous Au and base metals.

On **EL 1250 Nackara**, limited chip and stream sediment sampling over the Nackara Anticline - Paratoo Anticline area indicated only several areas of moderately anomalous Au.

In 1983-4, Jarmand Minerals and Exploration Pty Ltd, and Aminco and Associates Pty Ltd targeted stratabound and structurally controlled Au around **Teetulpa Goldfield** (**EL 1098 Teetulpa Goldfield**). Mapping, sampling and IP delineated steeply dipping conductors usually coincident with (gossanous and Cu-bearing) quartz-sulphide outcrop. Aeromagnetic interpretation indicated structurally controlled fracturing over a dome with moderate to high magnetic signature (Tindelpina Shale Member) to the north of Teetulpa, but cleavage controlled to radial quartz veining in the area was not auriferous.

At **Mannahill Goldfield**, mapping and sampling in 1983-85 by Jarmand Minerals & Exploration Pty Ltd, Aminco, and CSR Ltd (**EL 1161 Mannahill Goldfield**) was followed by re-assessment of Newmont's 1978 drilling and preparation of a resource estimate for **Westward Ho!**, **Elsie May**, and **Eudunda Hope / Jackson's**. Exploration did not delineate structural or stratigraphic extensions or repeats of mineralisation, but indicated a model for mineralisation (Curtis, J.L., 1986):

- a precursor stromatolitic dolomite bed in Enorama Shale
- with structurally-induced permeability developed during Delamerian folding
- magmatic? fluids emanating from the Teetulpa Fracture Zone to the west
- which migrated up the plunge axis of the regional D5 folding
- with initial silicification of the unit
- and subsequent introduction of gold in quartz-siderite-sulphide veining, with concurrent recrystallisation of the earlier replacive quartz.

On **EL 1226 Teetulpa Goldfield**, exploration by Jarmand Minerals and CSR over the 'Four Brothers Anticline' (informal name) north of Teetulpa was based on a similar stratigraphic - structural model (Curtis, J.L., 1985):

- the doming of a pyritic sedimentary succession
- differential competence causing fracturing and bedding plane slippage, resulting in lateral stratabound permeability
- and development of cross-cutting fractures in brittle units
- with introduction of Au by thermal convection of brines along regionally penetrative fracture systems

Exploration included mapping and sampling, reprocessing of aeromagnetics, ground magnetics, followed by 2 rotary holes totalling 251m with disappointing Au and base metal values.

On **EL 1164 Mannahill**, chip, soil and stream sampling by Amax Australia (Gold) Pty Ltd (later Austamax Gold Pty Ltd) for Telfer -style stratiform / stratabound Au extensions to Mannahill Goldfield, Mount Grainger and Ajax (on ORROROO 1:250 000 map sheet) etc indicated only minor anomalous Au and/or Pb-Ag-Zn associated with quartz veining; follow-up soil sampling downgraded the few prospective areas. Further south on **EL 1229 Boiekevie Hill**, soil and stream sediment sampling returned only disappointing Au and base metal values.

On **EL 1268 Tiverton Homestead**, exploration by Australian Anglo American Searches Pty Ltd for stratabound Au and base metals included structural interpretation of LANDSAT imagery and stream sediment sampling; the EL was relinquished following a change in strategic direction.

On **EL 1279 Manunda**, BLEG stream sediment sampling and rock-chip sampling by CSR Ltd indicated only minor Au anomalism.

On the adjacent **EL 1322 Teetulpa Goldfield**, **EL 1334 Wattle Dam**, and **EL 1346 Mannahill**, most exploration by Western Mining Corporation Ltd was concentrated on EL 1322. Exploration for 'Telfer-style stratabound Au' commenced with rock-chip, soil, and stream sediment sampling, and IP, resistivity and SIROTEM, focussing on extensions to known workings. 16 angled RC percussion holes totalling 979m at **Teetulpa** intersected black slates and micaceous schist with minor graphite and fine pyrite-coated fractures. With the exception of 1m at 2.27 ppm Au under the Blue Star - Jubilee line-of-lode, Au values were low.

In 1987-88, CRA Exploration Pty Ltd tested areas of low outcrop in the eastern and western closures of the Waukaringa Syncline, and the anticline to the south on **EL 1376 Hope Bank**; soil, overbank silt, and rock-chip sampling indicated some low-level anomalism:

- Au associated with Elatina Subgroup,
- As/Sb associated with a north-northeast joint set
- Zn/Au associated with Farina Subgroup
- Cu/Pb/Zn associated with anticlinal closures in Appila Tillite.

In 1987, mapping and sampling by Wavrin Holdings Pty Ltd on **EL 1395 Nillinghoo**, targeting Au associated with east-west faulting in anticlinal cores, returned only disappointing results.

In 1987-88, an orientation geochemical survey by The Shell Company of Australia Ltd and Tri-Arc Energy Ltd on **EL 1396 Benda Range** concluded that As, Cu and Ag were unreliable pathfinder elements for Au.

From 1987-92, rock-chip, stream and soil sampling by Fairview Gold Pty Ltd and Aztec Mining Co Ltd (later Cracow Resources Ltd, Placer Exploration Ltd) on **EL 1416 Bendigo Station** indicated 3 anomalous Cu-Au linear zones on local anticlines in Umberatana Group at Levi Range, and at Wheal Bassett and Hill Grange (on ORROROO 1:250 000 map sheet). At **Hill Grange**, formerly known as Agross Copper Mines, Cu-Au in multi-directional quartz, quartz-siderite and quartz-pyrite-chalcopyrite veining was associated with the Bulyaninnie Fault on the northwestern margin of the Bulyaninnie Diapir. 12 RC holes totalling 1080m indicated best Au was associated with supergene enrichment, with a maximum of 0.63 ppm Au.

At the **Mafeking Zn anomaly** in a synform on the flank of the Bulyaninnie Anticline (on ORROROO 1:250 000 map sheet), geological mapping and surface sampling indicated that pyritic limestone within sandstone (Tarcowie Siltstone? or Ulupa Formation?) contained from 0.1 to 1.5% stratabound Zn (as sphalerite with minor galena) over a 3 km strike length and 40m width. 14 RC holes totalling 1272m confirmed Zn - Pb - Ag anomalism in black pyritic shale and calcareous sediments, with increasing Zn grade with depth; best results were 245 ppm Pb and 0.62% Zn.

Follow-up drilling (5 RC and 2 RC-diamond holes, totalling 2319.7m) intersected pyritic laminated sandstone and sandy siltstone beneath pyritic carbonaceous siltstone; higher Zn is usually associated with the sandstone, with from 0.3 % to 0.5% Zn over 40 to 60m intervals as disseminations or veinlets of sphalerite, with minor galena.

In 1987-90, on **EL 1436 Mannahill**, rock-chip sampling by Hallmark Gold NL at **Mannahill Goldfield** was followed by 16 RAB holes totalling 440m, indicating stratabound ferruginous, sideritic and sulphidic quartz veining in saddle-reefs at Spanish American and Nectar, and complex (sulphidic) quartz veining at Birthday and Aurora Australis. With the exception of 620 ppb Au near the surface at Nectar Prospect, Au results were low.

Detailed mapping and sampling in 1988-90 on **EL 1470 Yunta - Paratoo** by Mount Street Securities (later Yunta Gold Pty Ltd and Fairview Gold Pty Ltd) downgraded the potential of the Paratoo area (on ORROROO 1:250 000 map sheet) for commercial copper oxide mineralisation, but indicated potential for Au in the axial zone of the Paratoo dome.

In 1988-89, exploration over **EL 1528 Giles Nob** over the southeastern portion of **Wadnaminga Goldfield** by Battle Mountain (Australia) Inc included ground magnetics, IP, soil sampling, and 2 drilling programs totalling 36 angled RC holes totalling 1540m at the **Golden Sophia - Luron** prospect. Drilling outlined a large pervasively mineralised system related to a 300 by 700m magnetic high, but did not intersect significant Au mineralisation; petrology indicated that 'mineralisation is related to the intrusion of a felsic, magnetite series granitoid, inferred to be comparable to Carlin-style mineralisation' (Field, T.W., 1989).

In 1990-91, exploration by Aztec Mining Co Ltd in the Wilyerpa Formation on the southern flank of Ulupa Syncline in the Benda Ranges, in **EL 1657 Nilpena Hill**, included detailed mapping and stream and rock-chip sampling, indicating supergene Cu-Au-Ag enrichment near the old **Maldorky** workings, associated with tensional fracturing in the axial zone of a southerly plunging anticline.

In 1990-91, based on processing of airborne magnetics and radiometrics and assessment of prior exploration on **EL 1678 Devenborough Downs**, Southern Ventures Ltd concluded that potential for large scale base metal or Wadnaminga Goldfield-style Au mineralisation was low in the **Wadnaminga** area.

Exploration in 1991-93 by Aztec Mining Co Ltd and Climax Mining Ltd (later Oxford Resources Pty Ltd) on the relinquished portions of **EL 1711 Copperlinka** included mapping and sampling, in particular of the old workings along the **Kings Bluff line-of-lode**.

In 1994-95, on **EL 1961 Yunta - Mannahill**, Equinox Resources Ltd targeted structurally-controlled Telfer-style Au. Structural interpretation identified regional low-angle thrust faults, listric thrust ramps, steep reverse faults and strike-slip faults in the Nackara Arc; however a review of known mines and mineralisation followed by rock-chip and stream sediment sampling and a review of aeromagnetics concluded that known sites had limited potential, and "offer no encouragement or pointers for locating large scale buried / blind deposits" (Tomich, C.S., 1995).

Some of the above ELs also targeted base metal, or base metal anomalism was encountered in exploration (detailed above), in particular:

- EL 1102 Copperlinka, low level Zn anomalism at several locations, especially Echelon and Gorge Grids with best values of 930 ppm Cu, 1.48% Pb, 4000 ppm Zn at Echelon.
- EL 1164 Mannahill, minor Au and/or Pb-Ag-Zn associated with quartz veining.
- EL 1268 Tiverton Homestead, targeted stratabound Au and base metals.
- 1321 Iron Peak, targeted Au and base metals.
- EL 1376 Hope Bank; low-level As/Sb, Zn/Au, or Cu/Pb/Zn anomalism.
- EL 1416 Bendigo Station, the Mafeking Zn anomaly (on ORROROO), with 0.1 to 1.5% Zn over 3 km by 40m.

## II. PLACER GOLD DEPOSITS

Tenements: EL 734 Arkarula
EL 1413 Teetulpa Goldfield

In 1987-88 on **EL 1413 Teetulpa Goldfield**, Thomdrill Pty Ltd investigated the possibility of auriferous Pliocene placer deposits beneath the younger alluvial sediments at Salt Creek, north of the main alluvial workings at Brady's Gully at Teetulpa. Such Pliocene leads may have been protected from later erosion by a calcrete capping. Exploration included shallow seismic refraction,

and 27 RC and RAB holes totalling 272.9m on 3 traverses, but BLEG assays of drill cuttings were disappointing; best result was 8.0 ppb Au. However, at Teetulpa most exploration focussed on extensions to the gold vein deposits within Adelaidean metasediments of the Nackara Arc (ELs 1098, 1226, 1322, 1490) which are source to, and partially underlie, the extensive (but worked-out) alluvial Au deposit.

In 1991, exploration by Aztec Mining Co Ltd on **EL 734 Arkarula** for alluvial Au north of Teetulpa focussed on the 'Four Brothers Fan' (informal name), an extensive east-west alluvial fan derived from Willyama Supergroup granitoids further to the north. Exploration included a Thematic Mapper study, soil and stream sediment sampling, ground magnetics, and reconnaissance geological mapping, but did not reveal significant potential.

# III. ANABAMA GRANITE, ANABAMA - REDAN FAULT ZONE, BOUCAUT VOLCANICS AND BRAEMAR IRON FACIES

Tenements: EL 312, 508, 937 Cronje Dam
EL 753 Anabama Hill
EL 1234 Round Hill
EL 1285 Cronje Dam
EL 1321 Iron Peak
EL 1462 Lilydale
EL 1611 Mutooroo Station
EL 1685 Anabama
EL 1782 Anabama Hill
EL 1797 Bendigo
EL 2101 Anabama Hill

Several significant exploration programs for gold and/or base metals were targeted at the zone of outcropping (or under shallow cover) Neoproterozoic Adelaidean metasediments and Delamerian intrusives (eg the Anabama Granite) adjacent to the north of the east-northeast trending 30 km wide Anabama - Redan Fault Zone (merging into the Darling River Lineament to the east), which separates Adelaidean to the north from the deeper Neoproterozoic to Palaeozoic (meta)sediments to the south beneath the Tertiary Murray Basin.

Significant target units within the Adelaidean to the north of the Anabama - Redan Fault included the acid to intermediate Boucaut Volcanics - a target for volcanic-hosted base metal sulphides, and Braemar Iron facies - a target for Trough Tank and Starra-style stratiform syngenetic gold and copper mineralisation (associated with intrusive granites and contact metamorphism).

CSR Ltd targeted 'porphyry molybdenum mineralisation of the Climax (Colorado) type' within greisenised zones in the Anabama Granite at Anabama Hill.

Following detailed interpretation of aeromagnetics and satellite imagery, and results of drilling programs, the focus of exploration shifted to structurally controlled mineralisation related to the Anabama - Redan Fault and to alteration zones associated with the Delamerian granites.

## III.A DOMINANTLY METASEDIMENTARY & VOLCANIC TARGETS

From 1977 to 1984, **Carpentaria Exploration Co Pty Ltd** held consecutive tenements (**EL 312, 508, 937 Cronje Dam**) east-northeast of Lilydale Homestead on the northern margin of the Murray Basin. A comprehensive exploration program included stream sediment sampling over drainages from areas of Adelaidean outcrop, systematic soil and calcrete sampling, rock-chip sampling near historic workings, ground magnetics, SIROTEM, airborne magnetics and radiometrics.

However, much of the area is obscured by shallow cover, and systematic shallow RAB drilling was the main exploration technique. All holes were assayed for Cu, Pb, Zn, and some for Ag, Au, As, Ba, Cd, Co, K, Mn, Sn, Ti, and U. A total of 2140 RAB holes were completed for 22,761m, focussed in particular on the White Rock - Eastern Grids between the old Anabama Cu Mine and White Rock Dam, and Two Brothers Grid (around the old Two Brothers prospect) near Cronje Dam - Sisters Dam. 18 RC percussion holes totalling 2810m were completed at White Rock, Two Brothers, Division Dam / Anomaly F, and the Anabama Cu Mine area.

At **White Rock**, anomalous Cu was intersected in Boucaut Volcanics with minor secondary enrichment over an anomalous area of 1500m by 700m.

At **Two Brothers**, disseminated pyrite with minor chalcopyrite in quartz-biotite-feldspar schist returned peak values of 950 and 1900 ppm Cu.

At **Division Dam / Anomaly F**, drilling indicated persistent low grade Cu (best values of 76m at 1100 ppm Cu) and weakly anomalous Zn.

Low grade Cu was intersected beneath old workings at **Anabama Cu Mine**, and drilling along strike intersected limonitic (after sulphides) quartz veining or disseminated low-grade pyrite-chalcopyrite in schists with amphibolite layers - interpreted as metamorphic segregation of copper sulphides from pyritic black shales with significant secondary enrichment (Simpson, P.G., 1982).

From 1988 to 1993, **CSR Ltd** (later **Placer Exploration Ltd**) targeted Trough Tank and Starra-style gold in the Braemar Ironstone facies, and sedimentary and volcanic-hosted (Boucaut Volcanics) base metals (as well as heavy minerals in Tertiary sands) on **EL 1462 Lilydale**, covering Carpentaria Exploration's former ELs 312, 508, 937 Cronje Dam. At Trough Tank and Starra in Queensland, gold and copper are concentrated in stratiform syngenetic iron formations; the Starra deposit is also associated with intrusive granites and contact metamorphism (Circosta, G., 1989).

Reconnaissance sampling near the old **Eldorado Gold Mine** indicated minor Au anomalism in a complex magnetic zone associated with the contact with the Anabama Granite 4 km to the northeast. Detailed aeromagnetics and radiometrics were completed over the EL.

In 1988, regional rock-chip sampling and IP at Eldorado was followed by 10 RC percussion holes totalling 1031m, yielding disappointing results at **Anabama Mine Grid**, **Great Eastern Grid**, and **Homestead**, with minor Cu-Pb anomalism at **Eldorado Grid**. Placer concluded that potential for Starra-type mineralisation in Braemar Ironstone Facies was poor, but that potential remained for volcanic-hosted base metals (Cu-Au) in Boucaut Volcanics. Ongoing sampling downgraded the potential for skarn-type mineralisation associated with the Anabama Granite, and stratiform base metals in Benda Siltstone - Pualco Tillite.

Placer completed ground magnetics, and 248 RAB holes totalling 2742m in the **Anabama Mine** area, followed by 9 angled RC percussion holes totalling 1052m in 1989; an 87m diamond hole was abandoned in broken ground before target depth. Results were encouraging with "extensive low-grade copper mineralisation" (Circosta, 1990) in a major north-east trending shear zone and patchy gold in the footwall section. Best intersections were 8m at 0.83 g/t Au, 10m at 0.9 g/t Au, and 4m at 0.87g/t Au.

In 1990, an extensive BLEG soil sampling program defined further anomalous Cu and Cu-Au zones on Anabama Grid, and low-grade anomalous Cu-Au on **White Rock Grid** and **Two Brothers Grid**.

In 1990-91, 14 RC percussion holes totalling 1363m at **White Rock** intersected meta-volcanics; best results were 10.5% Cu in the top 14m, and 0.63 g/t Au, but mineralisation was of limited extent and confined to near-surface.

In 1990-91, 24 RC percussion holes totalling 3079m at **Anabama Mine** indicated complex along-strike facies changes as significant controls on Cu mineralisation. In 1992, a further 10 RC holes totalling 1090m closed off the mineralisation to the south, and a 'rough resource' was calculated at 4 Mt at 0.6% Cu with a cut-off of 0.1% Cu (Campbell, 1992, p1044).

In January 1993, Placer relinquished most of the EL, retaining only a smaller tenement over Anabama Mine.

Exploration in 1984-88 on **EL 1234 Round Hill** by **Utah / BHP** for stratiform Au and base metals extended down into the northern limb of a regional syncline north of the Anabama - Redan Fault Zone (see section on Nackara Arc).

In 1985, on **EL 1285 Cronje Dam** over the northern margin of the Anabama - Redan Fault Zone, exploration by **The Shell Company of Australia Ltd** targeting Boucaut Volcanics and intercalated (syngenetic?) pyritic schists, with discordant quartz ±pyrite-chalcopyrite-malachite veins within the former ELs 312, 508, 937 Cronje Dam was confined to some rock-chip sampling and re-interpretation of Carpentaria Exploration's data.

On **EL 1321 Iron Peak**, BLEG soil? sampling and rock-chip sampling over siliceous units of the Braemar Iron Formation north of the Anabama - Redan Fault Zone by **Newmont Holdings Pty Ltd** in 1986-87 returned negligible Au and base metal values.

In 1990-91, **Newmont Australia Ltd** (later **Newcrest Mining Ltd**) targeted gold in metasediments near the Anabama Granite on **EL 1685 Anabama**. Low-level Au-base metal and Cu-Pb-Zn anomalism indicated in initial soil, rock-chip, and stream sediment sampling was downgraded by follow-up sampling.

In 1989-94, on **EL 1611 Mutooroo Station** between Anabama Hill and the NSW border, following an initial program of exploration for

heavy minerals, **Southern Ventures NL** (later **Dominion Metals Pty Ltd**) targeted base metals within Adelaidean under shallow cover. Image processing and aeromagnetic interpretation identified 7 anomalies in the southern half of the tenement, on or just north of the Anabama - Redan Fault Zone: **Border, Perseverance, Jubilee, Sunrise, Alderman's, Maldorky, Cockrum's**. (The northern portion of the area of EL 1611 includes Willyama Supergroup metasediments northwest of the MacDonald Hill Fault, and was covered by ELs EL 1810 Duffields Dam for M.I.M. Exploration Pty Ltd and 2046 Mutooroo / Duffields for North Mining Ltd etc, as detailed in McCallum, 1997b).

Ground magnetics and 3 unsuccessful RAB holes were followed in 1991 by 46 aircore holes totalling 4056m. At **Maldorky**, anomalous Cu-Zn-Au in albite-actinolite-epidote-magnetite Adelaidean metasediments was interpreted as epigenetic replacement of favourable sediments adjacent to the Anabama Granite (Tonkin, 1991). A further 42 aircore holes totalling 4112m at Maldorky outlined 2 anomalous Cu-Zn-Pb zones, the larger being 2000+m long and 200-400m wide, sub-parallel to the enclosing metasediments.

In 1992, Dominion completed 25 aircore holes and 2 angled diamond holes at Maldorky, intersecting chalcopyrite, sphalerite and galena in veins in fractured schist. The geological interpretation shifted from "stratiform syngenetic or stratabound skarn-style mineralisation" to "a disseminated-transgressive epigenetic style of mineralisation related to granitic intrusive activity during Delamerian regional metamorphism" (Tonkin, D.G., Johnson, R.D., and Wills, K.J.A., 1993).

A follow-up regional aircore drilling program intersected the previously unknown 'Cornwall granitoid' (informal name), a possible source for the greisen-style hydrothermal alteration at Maldorky, and indicated a regional scale north-northeast trending zone of base metal anomalism. Reprocessing of aeromagnetic data confirmed the structural controls of mineralisation related to the Anabama - Redan Fault Zone.

A final program of 28 RAB holes totalling 868m targeted circular and linear aeromagnetic anomalies between **Maldorky** and **Alderman's**, intersecting greisenised (altered / hydrofractured) metasediments with anomalous Zn-Pb at the margins of a sericitic alteration zone, and anomalous Cu associated with quartz-sericite+tremolite/talc alteration.

In 1992-94, reprocessing of aeromagnetic data on **EL 1782 Anabama Hill** by **Dominion Metals Pty Ltd**, in conjunction with adjacent EL 1611 Mutooroo Station, indicated igneous and structural control of mineralisation, eg of Au and Au-Cu at Wadnaminga along northeast striking structures. 58 RAB/Hammer holes totalling 1847m targeted magnetic lows - structurally related or in Anabama Granite:

- Minor Cu-Zn anomalism associated with sericite and phlogopite alteration in biotite schists and pegmatite, aplite, and tonalite dykes at Old Granite Dam.
- Cu anomalism associated with phlogopite/chlorite/albite alteration in micaceous metasediments, aplite and tonalite between Turkeys Nest Bore and Anabama Hill.
- anomalous Cu-Zn associated with epidote/phlogopite alteration, or with haematite /manganese oxide veinlets, or with amphibolite and aplite dykes, within metasediments in a fault bounded magnetic low between 2 granite bodies between Horse Waterhole Dam - Dark Hill Dam.
- rock-chip sampling northeast of Anabama Hill indicated Cu anomalism near the margins of local granitoids

On **EL 1797 Bendigo**, exploration by **Fairview Gold Pty Ltd** and **Placer Exploration Ltd** in 1992-95 focussed on "Au - Cu mineralisation within structurally prepared hydrothermal sites proximal to oxidised Ordovician granitoids", eg the Bendigo Granite, analogous with Telfer in WA (Anderson, J.(John), 1994).

Reprocessing of aeromagnetics, rock-chip/petrology and stream sediment sampling, ground magnetics and IP indicated weak to moderate base metal anomalism at several zones near Mafeking - Bendigo: Lock Winnoch, NW Winnoch, Manunda Creek (on ORROROO 1:250 000 map sheet) , and at Nacua Prospect, Mafeking East, Wheal Motley, etc.

In 1993, 19 RC percussion holes totalling 1520m at **Mafeking East - Wheal Motley** intersected weak/minor base metal anomalism and weak Au anomalism in meta-siltstone, calc-silicates and limestone, and meta-basalt/meta-dolerite.

In 1994 - 95, 17 RC percussion holes totalling 1884m at 9 magnetic and geochemical targets failed to reveal significant base metals or Au in the Bendigo - Mafeking area.

In 1995, as part of the South Australian Exploration Initiative (SAEI), **MESA** completed ground magnetics and 24 reverse circulation holes (ANA1-24) totalling 1744.5m on 6 traverses east of Anabama Hill and south to east of Goode Hill (Hill *et al*, 1996, in prep.), over the interpreted granite - (Adelaidean) metasediment, and metasediment - Boucaut Volcanics boundaries. Drilling aimed to sample unexposed granite and adjacent Adelaidean metasediments and volcanics, and to measure the extent of greisenisation (host for low grade Cu-Mo). Drilling intersected 'I-type' leuco-monzogranite and hornblende-biotite-quartz monzonite, Adelaidean pelitic and/or arkosic metasediments and calc-silicates, and metabasalts.

3 holes (YUN1-3) totalling 96.5m targeted a magnetic dipole anomaly 12 km east-southeast of Yunta, interpreted from aeromagnetics as a possible obscured kimberlite or lamprophyre within Wilpena Group sediments on the northern limb of a regional syncline. Drilling intersected Adelaidean siltstone.

Geochemical results were disappointing, with best intersections of:

- 20 ppb Au in pelitic calcareous metasediment from 72-78m in ANA7
- 13 ppb Au in hornblende-biotite-quartz monzonite from 24-34m in ANA 13
- 12 ppb Au in calcareous siltstone from 16-24m in YUN3
- 500 ppm Cu in metasiltstone from 144-155.5m in ANA6
- 340 ppm Zn in calcareous siltstone from 26-36m in YUN1

### III.B DOMINANTLY IGNEOUS TARGETS

In 1980-82, **CSR Ltd** targeted 'porphyry molybdenum mineralisation of the Climax (Colorado) type' within the Anabama Granite at Anabama Hill, on **EL 753 Anabama Hill**. Structural interpretation of LANDSAT imagery delineated the Anabama-Redan Fault (Darling River Lineament Zone) adjacent to the south. A steeply-dipping 796m diamond hole collared in the centre of a Mo-Cu anomaly, intersected hydrothermally altered acid and intermediate intrusives, with persistent low grade Mo-Cu anomalism; some Mo-Cu was introduced prior to the latest phase of magmatism, with introduction of significant molybdenite in a final phase (Tonkin, D.G., and Wilson, P.D., 1981). Best intersections were 24m at 0.06% Mo, 27m at 0.19% Cu, and 29m at 3 g/t Ag; no samples recorded Au above detection limit, and Pb and Zn were uniformly low. Petrology concluded that "intensity of hydrothermal alteration, quartz vein development, and crack brecciation of the rocks is much below that generally associated with economic porphyry deposits" (Hellman, P.L., and Fountaine, R.J., 1982), and CSR concluded that there was little chance for deeper economic mineralisation.

In 1995-96, aeromagnetic re-interpretation and geological reconnaissance by **G.R. Turner and J.A. Jones** on **EL 2101 Anabama Hill** targeted structural features in the Anabama Granite and Adelaidean metasediments, and confirmed a strong sodic and potassic alteration zone extending out from the Anabama Granite, in particular along crush or fault zones.

## IV. DIAMONDS IN MESOZOIC KIMBERLITIC LAMPROPHYRES

Tenements: EL 942 Mount Misery
EL 1249 Cottage Bore
EL 1250 Nackara
EL 1311 Levi Range
EL 1797 Bendigo
EL 1799 Melton
EL 1973 Braemar

Exploration for diamonds focussed on an area extending from northeast of Burra towards Yunta, on the BURRA, CHOWILLA, ORROROO, and OLARY 1:250 000 map sheets, targeting Mesozoic kimberlitic lamprophyre dykes and plugs intruding Neoproterozoic Adelaidean metasediments, in particular in the region where the Nackara Arc diverges from the main body of the Adelaide Geosyncline.

Most exploration was by CRA Exploration Pty Ltd, on **EL 1249 Cottage Bore**, **EL 1311 Levi Range**, **EL 1799 Melton**, and **EL 1973 Braemar**.

On EL 1249, follow-up gravel sampling in 1985 (based on earlier work by Stockdale, SML 706) indicated a kimberlite rich in picroilmenites and chromites, with minor pyrope garnet.

Aerial magnetics and radiometrics were completed over EL 1311 and eastern EL 1249. Aeromagnetic and photogeological anomalies were ground checked, revealing a suite of metasomatically altered basic to ultrabasic rocks, with minor indicator minerals, and a microdiamond from the **Macky's Dam** area in EL 1249. In late 1985, 21 RC percussion holes totalling 392.5m failed to intersect kimberlitic rocks, and no microdiamonds were detected.

In early 1986, 4 RC holes totalling 165m on EL 1311 revealed lamprophyric dykes in 2 holes, but with no conclusive indicator minerals.

In 1992-3, CRA completed a regional helicopter gravel sampling program over EL 1799, northwest of Yunta, but none of the indicator minerals appeared to be of kimberlitic origin.

In 1994-6, ground magnetics and gravel or loam sampling over dipolar aeromagnetic anomalies 80 km northeast of Burra returned possible kimberlitic indicator minerals at 2 sites in EL 1973.

On **EL 1250 Nackara** (immediately south of CRA's EL 1249 Cottage Bore), Utah Development Co Ltd (later BHP Minerals Ltd) completed heavy mineral stream sediment and loam sampling for indicator minerals in 1984-6, but without success, and on **EL 942 Mount Misery**, heavy mineral and loam sampling failed to reveal kimberlitic indicator minerals.

In 1995, on **EL 1797 Bendigo**, Placer Exploration noted the potential for diamond-bearing kimberlites / lamprophyres, but no follow-up work was undertaken.

## V. HEAVY MINERALS IN TERTIARY MURRAY BASIN SEDIMENTS

Tenements: EL 1462 Lilydale
EL 1476 Oakvale
EL 1510 Quondong Vale
EL 1611 Mutooroo Station

In addition to exploration for base metals in Neoproterozoic Adelaidean basement on **EL 1462 Lilydale**, CSR Ltd (later Placer Exploration Ltd) undertook minor exploration for heavy minerals along the north to northwestern margin of the Tertiary Murray Basin. Ground magnetics at Staker Dam south of Anabama were followed in 1989 by 4 rotary holes totalling 92m at **Staker Dam** and 17 RAB holes totalling 572m at **Amateur Dam**. Drilling indicated a maximum of 1% heavy minerals, dominantly iron oxides with minor leucoxene, ilmenite, and zircon. In early 1991, a further 69 aircore holes totalling 2061m were completed on 6 traverse lines, but failed to intersect Pliocene Parilla Sand and Loxton Sand; heavy minerals were generally in excess of 3.5%, but were dominated by iron oxides

Further to the east, Peregrine Resources (Australia) Ltd completed airborne magnetics and radiometrics over **EL 1510 Quondong Vale** and adjacent **EL 1476 Oakvale**. In 1988, 29 aircore holes totalling 1319m on EL 1476 intersected Parilla Sand in every hole, with minor low-grade heavy minerals. In 1989, 66 aircore holes totalling 2385m (?) at Brooks Dam Grid (EL 1476) indicated up to 1% heavy minerals, and 4 reconnaissance holes totalling 171m on EL 1510 failed to intersect Parilla Sand. Follow-up work was limited to spectrometer traverses on EL 1612 (replacing EL 1476).

In 1989-94, Southern Ventures NL (later Dominion Metals Pty Ltd) targeted heavy minerals near Jubilee and Mulga Dams along the northern margin of the Murray Basin (**EL 1611 Mutooroo Station**), in addition to base metals in Neoproterozoic Adelaidean metasediments. 28 aircore holes totalling 744m intersected immature micaceous fluvial? Sands; anomalous TiO2 and ZrO2 (best results were 1.12% TiO2, and 600 ppm ZrO2) were too fine grained for economic recovery.

In 1991, 46 aircore holes targeting base metals in the Adelaidean intersected high titanium levels in the Cainozoic intersections, with a weighted average of 0.66% Ti over 25m at an average depth of 19.5m.

## VI. OTHER / INDUSTRIAL MINERALS

The only data released for industrial minerals (apart from heavy minerals) was by limited metallurgical and marketing work on the Ethiudna wollastonite by Adelaide Chemical Co Ltd (**EL 1593 Ethiudna Hill**) in 1989-90.

In addition to the Open File information held by MESA and reviewed herein, companies have reporting requirements to the Australian stock exchange (ASX). Publicly released information is available through the MINMET Australia Pty Ltd database. The only significant data release for exploration in pre-Adelaidean terrain was a resource estimate, based on prior drilling, at the **Ethiudna wollastonite** deposits (also known as the **Lake Katherine wollastonite**).

Based on prior work by Adelaide Chemical Company (EL 1593, see this volume), Minerals Corporation Ltd, who acquired ML 5780, reported an *indicated resource* of 600,000 tonnes at 35% wollastonite, containing 210,000 tonnes of

wollastonite (company prospectus, cited in MINMET). The wollastonite occurs in 3 folded lenses, interpreted to comprise a single folded horizon, in lenses between 10 and 20m thick, suitable for open cut mining.

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# SUMMARY OF EXPLORATION DATA

TENEMENT: ELs 312, 508, 937 Cronje Dam

COMPANY: CARPENTARIA EXPLORATION COMPANY PTY LTD

These consecutive tenements are summarised together, as they were all held by Carpentaria Exploration Co. Pty Ltd over an identical area, and exploration was continuous.

Formerly:

| | |
|---|---|
| SML 282, | MINES ADMINISTRATION P/L |
| SML 555 Brady's Dam, and SML 556 Wadnaminga, | MINES ADMINISTRATION P/L |
| joint venture partners | LONGREACH METALS NL |
| EL 16 Anabama, | SOUTH AUSTRALIAN DEPARTMENT OF MINES (SADM) |
| EL 173 Anabama Hill, | SOUTH AUSTRALIAN DEPARTMENT OF MINES (SADM) |

Followed by:

| | |
|---|---|
| EL 1285 Cronje Dam, | THE SHELL CO OF AUSTRALIA LTD |
| EL 1462 Lilydale, | CSR LTD, |
| sold in July 1988 to | PLACER EXPLORATION LTD |
| EL 1830 Anabama, | PLACER EXPLORATION LTD |
| Joint Venture with | COPPERFIELD GOLD NL |
| EL 1838 Lilydale | DOMINION GOLD OPERATIONS LTD |
| EL 2136 Cronje Dam, | COPPERFIELD GOLD NL |

EL 312

| | |
|---|---|
| COMMENCEMENT DATE: | 20.04.77 |
| EXPIRY DATE: | 19.04.79 |

EL 508

| | |
|---|---|
| COMMENCEMENT DATE: | 21.08.79 |
| EXPIRY DATE: | 20.08.81 |

EL 937

| | |
|---|---|
| COMMENCEMENT DATE: | 30.11.81 |
| EXPIRY DATE: | 29.11.84 |

| | |
|---|---|
| AREA: | 563 sq km |
| ENVELOPE: | Envelope 3608 Open File<br>Envelope 3018 Open File |
| DATA PLACED ON OPEN FILE: | December 1984 |
| REFERENCES: | Morris, B.J., 1977. Exploration Licence 173 - Final Report. An Investigation of Copper and Molybdenum Mineralisation at Anabama Hill and the Cronje Dam Copper Prospect, OLARY 1:250 000. *South Australia Department of Mines and Energy. Report Book* 77/51. |
| LOCATION: | West of Cronje Dam, 80 km southeast of Yunta on northern margin of the Murray Basin |
| 1:250 000 SHEET: | OLARY |
| 1:100 000 SHEET: | Yunta 6832, Anabama 6932 |
| TARGETS: | Volcanogenic base metal sulphides, Cu, Au, diamonds |
| AGE/ROCK UNITS: | Neoproterozoic Adelaidean Boucaut Volcanics & metasediments along northern margin of Tertiary Murray Basin |

EXPLORATION SUMMARY:

Exploration included stream sediment sampling (196 samples) in 1977-79 in drainages within the Adelaidean outcrop in the north of the EL; no anomalous Pb or Cu was recorded, and peak Zn was 160 ppm against a background of 40-60 ppm.

Systematic soil sampling (nearly 900 samples) was conducted in 1978-79 across all low rises (interpreted shallow basement) in the flatter southern portions of EL 508. 250 soil samples were collected from the top of the calcrete horizon in the Division Dam and White Rock areas in the east of EL 508 to determine the viability of mercury soil sampling as an indicator for Cu mineralisation.

Rock-chip sampling at Anabama Copper Mine (19 samples) and an old prospecting shaft at Two Brothers (7 samples) indicated low Au, with a peak of 1.5 ppm Au. At Anabama Copper Mine, 100 soil samples were collected on 5 grid lines along strike from the mine to determine extent of mineralisation east of the mine (soil cover to the west is transported), but revealed only low levels of base metals.

Geological mapping at Two Brothers revealed scattered quartz veining and boxwork after chalcopyrite?, with up to 4000 ppm Cu, 640 ppm Pb, 260 ppm Zn, 440 ppm Co, 15 ppm Ag, and 1.07% Mn in rock samples.

In 1977, ground magnetics were completed over a 25 km by 6 km strip oriented $060^0$, with traverses oriented at $330^{0.}$

Much of the area of exploration is obscured by shallow cover, and RAB drilling was the main exploration technique. All RAB holes were assayed for Cu, Pb and Zn, and some for Ag, Au, As, Ba, Cd, Co, K, Mn, Sn, Ti, and U.

In December 1977 (under EL 312), 105 RAB drillholes (423673 - 423732) totalling 996m delineated the stratigraphy at Two Brothers (in the west of EL 312) and White Rock, followed in June 1978 by a further 119 RAB holes (425682 - 425800) totalling 893m.

Also in June 1978, two angled percussion holes (WR-1, 80m, and WR-2, 82m) were drilled at White Rock, to test the 2000 ppm Cu anomaly found in the first RAB program.

In 1979 (now under EL 508), ground magnetics (10.4 line km) at the White Rock prospect was followed by SIROTEM (7.4 line km) and IP (6.2 line km) over a 1600 by 1000m grid, revealing a weak conductor partly coincident with the geochemical trend.

In August 1979, 273 RAB drillholes (W425601 - W425873) in the White Rock area totalling 2965m, at 80m spacing on traverses approximately across strike, revealed more extensive anomalous base metal dispersion in weathered Adelaidean, with Cu up to 1800 ppm and 3500 ppm, and Zn up to 620 ppm.

In September - October 1979, 645 RAB holes (540851 - 541468), totalling 6095m, at the Two Brothers Grid and Eastern Grid (an extended grid including White Rock prospect and Division Dam, bounded by Anabama Copper Mine, Boucaut's West Dam, White Rock Dam, Boucaut's East Dam), indicated Cu at several hundred ppm with peaks of 3400 ppm, and minimal Zn, Pb, As.

In May 1981, 218 RAB drillholes (552251 - 552468) totalling 1970m were completed on 15 traverses across strike at Two Brothers Grid, and 294 RAB holes (554251 - 554295 and 554770 - 555000) totalling 4358m on the Eastern Grid, plus an additional 486 RAB holes (718501 - 718931) in September 1981 (now under EL 937) on these 2 grids, totalling 5484m. Drilling intersected metasediments (meta-pelite, phyllite, schist, meta-quartzite, meta-psammite), calc-silicates, intrusives (micrograbbro) and meta-volcanics (meta-basalt, meta-dacite, meta-rhyolite).

28.1 line km of SIROTEM at Two Brothers, surrounding Anabama Copper Mine - Division Dam, and west of White Rock Dam, did not indicate major conductive bodies. In March 1982, 15 angled rotary percussion holes (CRD1-15), totalling 2438m, were drilled at 4 geochemical targets, defined by prior RAB drilling and SIROTEM, at White Rock prospect (CRD-11 to 15), Two Brothers prospect (CRD-1 & 2), Division Dam/Anomaly F (CRD-4 & 5), and Anabama Mine (CRD-3, & 6-10). Petrology included 82 samples from outcrop, prospecting pits or float, 84 samples from RAB drilling, and 83 samples from the percussion drilling.

At the Two Brothers prospect, percussion drilling intersected disseminated pyrite and minor chalcopyrite in quartz-biotite-feldspar schist, with from 20 to 790 ppm Cu, and peak values of 1900 and 950 ppm from the base of CRD-2.

At Division Dam/Anomaly F, persistent low-grade anomalous Cu was intersected in CRD-4, with 76m at 1100 ppm Cu, associated with weakly anomalous Zn.

At White Rock, anomalous Cu mineralisation was intersected in greenschist facies dolerite/basalt and silicified dacite of the Boucaut Volcanics; primary grades are from 0.1% to 0.3% Cu with minor secondary enrichment, and a best intersection of 76m at 0.32% Cu in CRD-11. RAB drilling outlined an anomalous 700m by 1500m zone, and mineralisation intersected in percussion drilling is open along strike.

At Anabama Copper Mine, only low grade anomalous Cu was intersected in CRD-3 and 4 under the mine. The strike extension to the west of the mine is obscured by creek outwash, but phyllites 1.5 km to the west-southwest include limonitic (after sulphides) quartz veining. Disseminated low-grade pyrite-chalcopyrite was intersected in 4 holes, 1 km northeast along strike from the mine in graphitic quartz-phlogopite schists with amphibolite layers; mineralisation is interpreted as metamorphic segregation of copper sulphides from pyritic black shales; quartz veining is commonly cupriferous, with up to 4.3% Cu (CRD-10, 96-98m). Secondary enrichment is significant, and primary mineralisation may be only a few thousand ppm. The mineralisation has an apparent strike width of 200+m, is open along strike and at depth, with a best intersection (secondary enrichment) of 130m (44-174m) at 0.6% Cu in CRD-10, including 12m (86-98m) at 1.51% Cu (*Simpson, P.G., August 1982. Exploration Licence No 937 - 'Cronje Dam'. Progress Report to July 1982. Carpentaria Exploration Co. Pty Ltd, Technical Report No 1140. In Envelope 3608*).

In mid 1983, SIROTEM (14.4 line km) were conducted to test, unsuccessfully, for conductive massive sulphides, and 7 resistivity soundings were inconclusive as to depth of oxidation near Anabama Mine. In late October, an airborne magnetic / radiometric survey was flown (1200 line km), and followed in early 1984 by ground magnetics (3.2 line km) over 3 aeromagnetic anomalies (interpreted as possibly discrete kimberlites)

The area around Anabama Mine and the hills to the north was mapped in detail, and in August 1984, 3 rotary percussion drillholes (CRD-16 to 18) totalling 210m on the magnetic anomalies intersected intermediate igneous rocks and weathered metasediments / calc-silicates (*Binks, P.J., November 1984. Exploration Licence No 937 - 'Cronje Dam'. Progress Report and Final Report to November 29, 1984. Carpentaria Exploration Co. Pty Ltd, Technical Report No 1312. In Envelope 3608*).

MINERALISATION / PROSPECTS:
White Rock prospect
Anabama Copper Mine (see Envelope 3608 p0074 and Figs 3608(v)-16 & 17 for geological map): 85 tons of cupriferous quartz vein was produced in 1909, for 1 ton of copper metal. Malachite, cuprite and chalcocite is in 3 ferruginous quartz veins sub-parallel to the enclosing phyllites.
Two Brothers prospect (a 6m deep shaft on malachite-stained quartz-chlorite schist)

NAMED GRIDS etc:
Two Brothers Grid
Eastern Grid
White Rock Grid

Division Dam / Anomaly F
Boucaut's West
Flat Paddock

PREVIOUS DRILLING:
1972-74: SADM drilled 5 vertical rotary percussion holes totalling 397m at Two Brothers area, intersecting weakly mineralised schists, with a best intersection of 14m at 0.12% Cu (Morris, 1977)

DRILLING BY CARPENTARIA:
December 1977:
White Rock and Two Brothers:

- 105 RAB holes (423673 - 423732), totalling 996m

June 1978:

- White Rock and Two Brothers: 119 RAB holes (425682 - 425800) totalling 893m.
- White Rock: two angled percussion holes (WR-1, 80m, and WR-2, 82m).

August 1979:
White Rock area:

- 273 RAB drillholes (W425601 - W425873) totalling 2965m.

September - October 1979:
Two Brothers Grid and Eastern Grid:

- 645 RAB holes (540851 - 541468), totalling 6095m.

May 1981:

- Two Brothers Grid: 218 RAB drillholes (552251 - 552468) totalling 1970m.
- Eastern Grid: 294 RAB holes (554251 - 554295 and 554770 - 555000) totalling 4358m.

September 1981:
Two Brothers Grid and Eastern Grid (now under EL 937):

- 486 RAB holes (718501 - 718931), totalling 5484m.

March 1982:
White Rock, Two Brothers, Division Dam/Anomaly F, and Anabama Mine:

- 15 angled rotary percussion holes (CRD1-15), totalling 2438m.

August 1984: Anabama Mine area:

- 3 rotary percussion drillholes (CRD-16 to 18) totalling 210m

Total: 2140 RAB holes (22761m)
20 rotary percussion holes (2810m)

| | |
|---|---|
| TENEMENT: | EL 363 Mannahill Goldfield |
| COMPANY: | NEWMONT PTY LTD |
| Formerly: | |
| SML 479 Mannahill, | ELVIRE P/L |
| SML 635 Mannahill, | ELVIRE P/L |
| Followed by: | |
| EL 530 Yardlowie - Mannahill, | CRA EXPLORATION P/L |
| EL 1161 Mannahill Goldfield, | JARMAND MINERALS & EXPLORATION P/L |
| EL 1164 Mannahill, | AMAX AUSTRALIA (GOLD) P/L |
| EL 1322 Teetulpa, | WESTERN MINING CORPORATION LTD |
| EL 1334 Wattle Dam, | WESTERN MINING CORPORATION LTD |
| EL 1346 Mannahill, | WESTERN MINING CORPORATION LTD |
| AREA: | 209 sq km |
| COMMENCEMENT DATE: | 17.10.77 |
| EXPIRY DATE: | 28.5.78 (surrendered) |
| ENVELOPE: | 3224 Open File |
| DATA PLACED ON OPEN FILE: | 1978 ? |
| REFERENCES: | - |
| LOCATION: | Mannahill Goldfield |
| 1:250 000 SHEET: | OLARY |
| 1:100 000 SHEET: | Winnininnie 6833 |
| TARGETS: | Au |
| AGE/ROCK UNITS: | Sturtian Enorama Shale (Umberatana Group) |

EXPLORATION SUMMARY:
Initial exploration at Mannahill Goldfield comprised detailed chip and channel sampling of surface and underground workings at Homeward Bound, Eudunda Hope, Elsie May, Westward Ho!, Jackson's (Sockson's ?) Nectar, No Gammon, and Trojan. Au is contained within a stratiform zone of conformable veins of quartz + carbonate + barite + pyrite or boxwork after pyrite, with blebs of pyrite disseminated in the host rock shale and siltstone. Best values were up to 32 g/t at Homeward Bound and 20 g/t at Eudunda Hope, with average grades of 4.3 g/t at Homeward Bound, 2.3 g/t at Elsie May, and 2.7 g/t at Westward Ho!. On 3-15 March 1978, 25 percussion holes (M1-25) totalling 717m were completed over the lode horizon between Westward Ho! and Jackson's line of diggings, indicating an extensive sub-horizontal stratiform lode horizon from 0.5 to 1.5m width, but containing only low and patchy gold mineralisation, less than open-cuttable ore grade. Higher results in surface sampling may result from supergene surficial enrichment (*Verwoerd, P.J., May 1972. Final Report, Exploration Licence 363 (Mannahill), for the Period October 17 1977 - May 31 1978. Newmont Pty Ltd. In Envelope 3224*)

MINERALISATION / PROSPECTS (*Envelope 3224, maps 3224-3 to -7*):

| | |
|---|---|
| Mannahill Goldfield: | Homeward Bound |
| | Westward Ho! |
| | Elsie May Mine |
| | Sockson's & No Gammon prospects |
| | Eudunda Hope Mine |

DRILLING:
March 1978: 25 percussion drillholes (M1-15) totalling 717m.

| | |
|---|---|
| TENEMENT: | EL 530 Yardlowie - Mannahill |
| COMPANY: | CRA EXPLORATION PTY LTD |
| Formerly | |
| SML 214, 214A, 331, 351, 351A, 517, 590 (Waukaringa, Ajax, Teetulpa), | R.M.C. MINERALS |
| SML 479 Mannahill | ELVIRE P/L |
| SML 635 Manna Hill | ELVIRE P/L |
| EL 16 Anabama, | SADM |
| EL 173 Anabama Hill, | SADM |
| EL 196, Wadnaminga Goldfield, | STOCKHOLM MINING EXPLORATION NL |
| EL 363, Mannahill, | NEWMONT P/L |
| Followed by: | |
| EL 584 Mount Victor, | CRA EXPLORATION P/L |
| AREA: | 2437 sq km, reducing to 2 blocks totalling 904 sq km on 08.01.81 |
| COMMENCEMENT DATE: | 12.09.79 |
| EXPIRY DATE: | 14.05.81 |
| ENVELOPE: | 3686 Open File |
| DATA PLACED ON OPEN FILE: | 1981 ? |
| REFERENCES: | |
| | Morris, B.J., 1974. EL 16, Progress Report for the Six Month Period Ending October 25 1974, Final Report. *South Australia Department of Mines. Report Book* 75/39 |
| LOCATION: | NE of Peterborough, including portions of Mannahill Goldfield |
| 1:250 000 SHEET: | OLARY, ORROROO |
| 1:100 000 SHEET: | Yunta 6832, Winnininnie 6833, Anabama 6932, Olary 6933 |
| TARGETS: | Telfer-style Au in vein setting, in anticlinal hinges |
| AGE/ROCK UNITS: | Neoproterozoic Adelaidean Burra Group and Yudnamutana Subgroup |

EXPLORATION SUMMARY:
Exploration for Telfer-style Au in stratiform / stratabound ferruginous quartz veins in anticlinal hinges in Adelaidean metasediments (siltstones and sandstones in particular) focussed on prospective regional structures:

- Winnininnie Grid (over the Winnininnie Dome on the Paratoo Anticline)
- Florina Grid (east of Mannahill Goldfield)
- Waukaringa Grid (over the northeast closure of the Waukaringa Syncline).

Orientation sampling included detailed geochemical analysis of mineralised rock samples (24 samples) to determine diagnostic trace elements (As is related to Au; Cu, Pb, Zn not necessarily so), and soil auger sampling (42 samples) which indicated some secondary low-level dispersion of Au in the soil horizon, such that sampling at 30m spacing should detect any mineralised veins. Mapping downgraded the potential for further mineralisation near Homeward Bound (Mannahill Goldfield).
Sampling of 23 costeans on the Waukaringa line of lode (on ORROROO 1:250 000 map sheet), at an average spacing along strike of 200m, intersected thin stratabound, south-dipping quartz-limonite veins in most costeans, and returned generally low Au, but with 4 samples (out of 75) better than 0.04 ppm Au and a peak of 0.48 ppm Au over 1m associated with quartz veining; 25 samples returned 0.05 ppm Ag or better, with a peak of 1.34 ppm Ag (*Mayer, T.E., August 1980. Third Quarterly Report on Mannahill EL 530, South Australia, for Period Ending June 11 1980. CRA Exploration Pty Ltd. In Envelope 3686*).

In early 1980, shallow auger sampling (at 30m spacing on traverses across strike at 3 km spacing, with an average depth to bedrock of 1.46m) comprised:

- 541 holes at Winnininnie
- 424 holes at Florina

- 597 holes at Waukaringa (on ORROROO 1:250 000 map sheet)

These were analysed for Au, As, Pb, and Cu, but gold assays were low, such that for follow-up work, samples above detection limit (10 ppb) were considered anomalous. Low level anomalous Au was detected near the northeastern closure of the Winnininnie Dome, and near a synclinal closure on Waukaringa Grid (*Mayer, T.E., April 1980. Second Quarterly Report on Mannahill EL 530, for Period Ending March 11 1980. CRA Exploration Pty Ltd. In Envelope 3686*).

Follow-up detailed soil horizon augering of anomalous Au-As-Pb-Cu-Zn at Florina Prospect (on Florina Grid) returned values up to 3.33 ppm Au; patchy Au was interpreted as representing thin cleavage-related quartz-iron veining.

In June 1980, close spaced bedrock auger drilling (128 holes totalling 402.3m) at Florina Prospect (26 auger holes), Nectar Mine (21 holes at 15m spacing along a north-south traverse), No Gammon (14 holes), and North and South Prospect at Wadnaminga Goldfield (67 holes) produced only minor anomalous Au. This was followed by 3 rotary percussion holes (80FP1-3) totalling 100m at Florina Prospect, which revealed no significant mineralisation. 9 shallow percussion drillholes (80NP1-9) at Nectar and 2 holes (80NGP1 & 2) at No Gammon also failed to reveal significant mineralisation, with a maximum of 3.5 ppm Au at Nectar. Of the 5 percussion drillholes (80NSP1-5) at North and South Prospect, 4 failed to penetrate unsuspected thick (in excess of 35m) Tertiary cover (a possible locus for alluvial Au), and 80NSP5 could not penetrate the dolomitic siltstone (*Mayer, T.E., April 1981. Final Report on Mannahill EL 530, South Australia, Including Sixth Quarterly Report for the Period Ending 11 March 1981. CRA Exploration Pty Ltd. In Envelope 3686*).

MINERALISATION / PROSPECTS:

Mannahill Goldfield

Nectar
No Gammon
Homeward Bound

Royal Charlie Au Mine
Teetulpa Goldfield
Wadnaminga Goldfield

North and South Mine

Waukaringa Goldfield (on ORROROO 1:250 000 map sheet)
Ajax line of workings (on ORROROO 1:250 000 map sheet)
Boomerang Au Mine (2 shafts and several costeans on a 1m thick quartz-arsenopyrite-pyrite-goethite vein, striking $176^0$ and dipping $70^0$ east; workings extend for 200m along the vein, which can be traced a further 100m north; enclosing Waukaringa Siltstone strike $063^0$ dipping ~$18^0$ northwards; a strong axial plane cleavage strikes $063^0$ dipping ~$81^0$ southwards; selected sample of oxidised ferruginous quartz breccia contained 18.72 ppm Au; a selected sample of unoxidised quartz-arsenopyrite-pyrite vein contained 3.07 ppm Au, and a sample of host rock spotted siltstone contained 0.11 ppm Au)

DRILLING:

Early 1980: 1562 shallow auger holes:

- 541 at Winnininnie
- 424 at Florina
- 597 at Waukaringa (on ORROROO 1:250 000 map sheet)

June 1980: 128 close-spaced bedrock auger drillholes totalling 402.3m:

- Florina Prospect, 26 holes
- Nectar Mine (Mannahill Goldfield), 21 holes
- No Gammon (Mannahill Goldfield), 14 holes
- North and South Prospect (Wadnaminga Goldfield), 67 holes

Late 1980: 19 rotary percussion drilling totalling 437m:

- Florina Prospect, 3 holes (80FP1-3, totalling 100m)
- Nectar Mine, 9 shallow percussion drillholes (80NP1-9, totalling 159m)

- No Gammon, 2 holes (80NGP1 & 2, totalling 52m)
- North and South Prospect, 5 holes (80NSP1-5, totalling 126m)

| | |
|---|---|
| TENEMENT: | EL 584 Mount Victor |
| COMPANY: | CRA EXPLORATION PTY LTD |
| Formerly:<br>EL 530 Yardlowie - Mannahill, | <br>CRA EXPLORATION P/L |
| Followed by:<br>EL 939 Mount Victor,<br><br>EL 1395 Nillinghoo, | <br>BARRIER EXPLORATION NL,<br>and HELM CORPORATION LTD<br>WAVRIN HOLDINGS P/L |
| AREA: | 262 sq km |
| COMMENCEMENT DATE: | 14.02.80 |
| EXPIRY DATE: | 13.02.81 |
| ENVELOPE: | 3847 Open File |
| DATA PLACED ON OPEN FILE: | 1981 ? |
| REFERENCES: | - |
| LOCATION:<br>1:250 000 SHEET:<br>1:100 000 SHEET: | Nillinghoo Goldfield, 55 km north of Yunta<br>OLARY, ORROROO<br>Winnininnie 6833, Koonamore 6733 |
| TARGETS: | Au, base metals |
| AGE/ROCK UNITS: | Burra Group and Yudnamutana Subgroup |

EXPLORATION SUMMARY:
Gold in the vicinity of Kirkeek's Treasure Au Mine is patchy and is "concentrated within transgressive tensional quartz-limonite-haematite-pyrite-(gold) veins within a feldspathic quartzite unit enclosed by (dolomitic) siltstones. Exploration in the first half of 1980 included geological mapping (including surface and underground mapping), rock-chip sampling, 5 ground magnetic traverses, and 330 soil samples. This was followed in February-March 1980, by 4 diamond drillholes (79/80KTD1, 80KTD2, 80KTD3, 80KTD4), totalling 373m - though on Mineral Leases excluded from EL 584 (CRA held MLs 4824, 4825, 4826, with options over MLs 4106, 4209, 4244, 4529, 4824, 4825, 4826, 4842); gold assays were low, and the prospect was downgraded. Best intersection was 16m (19-35m) in 80KTD2 averaging 1 ppm Au including 1m at 4.45 ppm Au

In October 1980, 77 shallow percussion drillholes (80KTP1-77) totalling 760.5m at 5m spacing on 3 traverses at 50m spacing were completed on EL 584 (4 holes: 80MVP1-4, totalling 35m), ML 4209 (55 holes: 80KTP1-13, 24-46, 56-73) and ML 4529 (18 holes: 80KTP14-23, 47-55) to test the potential for a low grade open-pittable resource. Gold assays were erratic and low, and failed to outline economic mineralisation - though only 500m of the 2000m strike extent of the potentially mineralised horizon at Kirkeek's Treasure was drilled (*Mayer, T.E., December 1980. Final (Relinquishment) Report on Mount Victor EL 584, South Australia, Including Fourth Quarterly Report for Period Ending February 13th, 1981. CRA Exploration Pty Ltd. In Envelope 3847*).

MINERALISATION / PROSPECTS:

| | |
|---|---|
| Nillinghoo Goldfield: | Kirkeek's Treasure Au Mine |

DRILLING:
February-March 1980: 4 diamond drillholes (79/80KTD1, 80KTD2, 80KTD3, 80KTD4), totalling 373m (on Mineral Leases excluded from EL 584)

October 1980: 77 shallow percussion drillholes totalling 760.5m, of which 4 (80MVP1-4) totalling 35m were within EL 584

| | | |
|---|---|---|
| TENEMENT: | | EL 753 Anabama Hill |
| COMPANY: | | CSR LTD |
| Formerly: | | |
| SML 262, | | ASARCO (AUST.) P/L<br>The area of Anabama Hill and Netley Hill were held by SADM as special reserves from relinquishment of SML 262 until 1972 |
| SML 282, | | MINES ADMINISTRATION LTD |
| SML 556 Wadnaminga, | | LONGREACH METALS NL, |
| | and | MINES ADMINISTRATION LTD |
| EL 16 Anabama, | | SADM |
| EL 173 Anabama, | | SADM |
| Followed by: | | |
| EL 1234 Round Hill, | | UTAH DEVELOPMENT Co |
| EL 1685 Anabama Hill, | | NEWCREST MINING LTD, |
| | and | NEWMONT AUSTRALIA LTD |
| EL 1782 Anabama, | | DOMINION METALS P/L |
| AREA: | | 708 sq km |
| COMMENCEMENT DATE: | | 07.11.80 |
| EXPIRY DATE: | | 06.11.82 |
| ENVELOPE: | | 4029 Open File |
| DATA PLACED ON OPEN FILE: | | 1982 ? |
| REFERENCES: | | - |
| LOCATION: | | Anabama Hill |
| 1:250 000 SHEET: | | OLARY |
| 1:100 000 SHEET: | | Anabama 6932 |
| TARGETS: | | Porphyry A and Mo of the Climax (Colorado) type |
| AGE/ROCK UNITS: | | Delamerian Anabama Granite |

EXPLORATION SUMMARY:
Following evaluation of prior drilling (DDH 4,5,6, by SADM) at Anabama Hill, it was concluded that the Anabama Hill prospect held potential for porphyry molybdenum mineralisation of the Climax (Colorado) type. In May-June 1981, a cored diamond hole (DDH AN7), collared in the centre of a Mo-Cu anomaly, was completed to 796m depth, angled steeply to the north. The hole intersected hydrothermally altered acid and intermediate intrusives, with persistent low grade Mn-Cu anomalism. The interpreted sequence of intrusion and alteration was:

- intrusion of granodiorite
- k-metasomatism
- intrusion of microgranite
- quartz/pyrite/K-feldspar veining, muscovite/quartz/K-feldspar alteration, and introduction of some molybdenite and chalcopyrite
- intrusion of porphyritic microdiorite
- intrusion of adamellite, sericitic alteration of porphyritic microdiorite
- late quartz/pyrite/muscovite veining, with development of muscovite/quartz greisens, and introduction of significant molybdenite.

(*Tonkin, D.G., and Wilson, P.D., August 1981. Third Quarterly Report on Exploration Licence 753 Anabama Hill Area, South Australia, for Period Ending 6th July 1981. CSR Ltd - Minerals Division, Report EMR 103/81. In Envelope 4029*).

Core was analysed for Mo, Cu, Pb, Zn, Ag, Sn, and W. Best intersections were:

| | |
|---|---|
| Mo: | 24m (281-305m) at 0.06% Mo, including 302-305m at 0.19% Mo |
| Cu: | 27m (548-575m) at 0.19% Cu, including 563-566m at 0.67% Cu |
| Ag: | 29m (764-785m) at 3 g/t Ag, including 773-776m at 6 g/t Ag. |

No samples recorded Au above detection limit, and Pb and Zn were uniformly low
(*Tonkin, D.G., December 1981. Fourth Quarterly Report on Exploration Licence 753 Anabama Hill Area, South Australia, for Period Ending 6th November 1981. CSR Ltd - Minerals Division, Report EMR 158/81. In Envelope 4029*).

Follow-up work included structural interpretation of LANDSAT imagery to delineate the Anabama-Redan Fault (Darling River Lineament Zone) adjacent to the south, fluid inclusion studies (which were of limited value in interpreting mineralising events), and petrology on 120 thin sections from the drill core, concluding that "the intensity of hydrothermal alteration, quartz vein development, and crack brecciation of the rocks is much below that generally associated with economic porphyry deposits" (*Hellman, P.L., and Fountaine, R.J., July 1982. Petrological Examination of Thin Sections from EL 753 - Anabama Hill, South Australia. CSR Ltd - Minerals Division, Report EMR 110/82. In Envelope 4029*).

In summary, CSR concluded that the massive greisen that forms the cap of Anabama Hill decreases with depth, and that the molybdenum mineralisation is derived from the biotite adamellite intersected at depth in the drillhole. Thus there is little chance for deeper economic mineralisation (*Stokoe, G.C., December 1982. Eighth and Final Quarterly Report on Exploration Licence 753 Anabama Hill Area, South Australia, for Period Ending 6th November 1982. CSR Ltd - Minerals Division, Report EMR 187/82. In Envelope 4029*).

MINERALISATION / PROSPECTS: Minor Mo-Cu within the Anabama Granite

DRILLING:
May-June 1981: diamond hole (DDH AN7) cored to 796m depth, angled steeply to the north.

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|---|---|
| TENEMENT: | EL 925 Weekeroo Hill |
| COMPANY: | ASWAN PTY LTD |
| Formerly: | - |
| Followed by: | - |
| AREA: | 363 sq km |
| COMMENCEMENT DATE: | 16.11.81 |
| EXPIRY DATE: | 08.07.82 |
| ENVELOPE: | No Envelope |
| DATA PLACED ON OPEN FILE: | No data supplied |
| REFERENCES: | - |
| LOCATION: | Weekeroo Hill - Teetulpa Goldfield |
| 1:250 000 SHEET: | OLARY |
| 1:100 000 SHEET: | Winninnie 6833 |
| TARGETS: | - |
| AGE/ROCK UNITS: | - |
| EXPLORATION SUMMARY: | No work reported |
| MINERALISATION / PROSPECTS: | Teetulpa Goldfield |
| DRILLING: | Nil |

| | |
|---|---|
| TENEMENT: | EL 939 Mount Victor |
| COMPANY:<br>Name change to | BARRIER EXPLORATION NL<br>HELM CORPORATION LTD |
| Formerly:<br>EL 584 Mount Victor, | <br>CRA EXPLORATION P/L |
| Followed by:<br>EL 1979 Mount Victor,<br>EL 2084 Mount Victor, | <br>M. SELGA<br>M. SELGA |
| AREA: | 262 sq km<br>Surrounding but not including MLs 4824-6 (CRAE), 4106, 4209, 4244, 4529, 4842 covering Nillinghoo Goldfield |
| COMMENCEMENT DATE: | 30.11.81 |
| EXPIRY DATE: | 29.11.86 |
| ENVELOPE: | 4505 Open File |
| DATA PLACED ON OPEN FILE: | January 1987 |
| REFERENCES: | - |
| LOCATION: | Mount Victor, 60 km north of Yunta |
| 1:250 000 SHEET: | OLARY, ORROROO |
| 1:100 000 SHEET: | Winnininnie 6833, Koonamore 6733 |
| TARGETS: | Telfer-style stratabound / stratiform Au |
| AGE/ROCK UNITS: | Neoproterozoic Adelaidean metasediments, Burra Group and basal Umberatana Group |

EXPLORATION SUMMARY:
Similarities between gold in Burra Group in the vicinity of the old Kirkeek's Treasure Au Mine (Nillinghoo Goldfield) and gold at Telfer in Western Australia (especially the presence of Au-bearing sulphidic quartz veining) indicate the potential for this area; previous exploration by CRA Exploration Pty Ltd was restricted to discordant quartz veining adjacent to the mine, and had ignored the area east of Kirkeek's Treasure and the potential for stratabound mineralisation. Geophysics and arsenic geochemistry should reveal concealed stratabound oxidised sulphidic ore (*P.J. Legge & Associates Pty Ltd, November 1981. Proposal for Gold exploration, Mt Victor EL 939, South Australia (NE Orroroo- NW Olary Sheets), for Barrier Exploration NL. In Envelope 4505*)

EL 939 covers an east-west domal structure, including 60 km strike length prospective for stratabound mineralisation. Exploration included interpretation of prior aeromagnetics and LANDSAT data, and photo-geological interpretation (by Hunting Geology and Geophysics); field checking indicated the importance of small-scale folding on localising veining / mineralisation. Analysis of 43 rock samples in late 1982 indicated anomalous Cu, Pb, Zn, Ag, As in a quartz vein in quartzite, anomalous Cu, Zn, Ag in gossanous quartz veins, and anomalous Au (8.8 ppm) at Kirkeek's Treasure (*Clavarino, J.G., and Pyper, R.C., January 1983. EL 939 Mt Victor, SA, Report on Gold Mineralisation and Exploration Potential. Barrier Exploration NL. In Envelope 4505*).

Follow-up geological mapping indicated a 400m by 300m area of quartz stockwork veining 3.5 km southeast of Kirkeek's Treasure; rock samples (18) indicated anomalous As, Cu, Ag along strike from Kirkeek's Treasure, and orientation stream sediment sampling indicated that panning was an effective exploration technique (*Clavarino, J.G., February 1984. EL 939 Mt Victor, SA, Report for Quarter ended 29th February 1984. Barrier Exploration NL. In Envelope 4505*).

In August-September 1984, 12 angled RC percussion drillholes (MV84/1-12) totalling 708m were completed.
Holes MV84/1-4 along strike to the west from Kirkeek's Treasure intersected steeply dipping generally barren quartzites and shales; best results were 0.68 ppm Au.

Holes MV84/5-9 along strike to the east from Kirkeek's Treasure intersected quartzites and shales, with anomalous Au in all holes; best results were from hole 16 with 10m (34-44m) at 5.72 ppm Au and 16m (44-60m) at 1.12 ppm Au.
Holes MV84/10-12, across the area of quartz stockwork veining, intersected steeply dipping quartz veins in shale and siltstone, with only minor anomalous Au up to 0.46 ppm.

In February - April 1985, follow-up drilling to delineate the prospective quartzite horizon to the east of Kirkeek's Treasure comprised 43 RAB drillholes totalling 448m and 15 angled RC percussion drillholes (MV85/1-15) totalling 778m. RAB drilling delineated the mine sequence quartzite for 300m to the east, but RC percussion drilling to the east and west of the mine indicated only patchy low-grade Au mineralisation. Best result was hole MV85/7 adjacent to the east of the mine with 38m at 1.79 ppm Au including 6m at 7.17 ppm Au. Drilling significantly downgraded the potential for large tonnage extensions to the mine (*Dawney, R.L.., June 1985. EL 939 Mt Victor, SA, Report for Quarter Ended 30th May 1985. Barrier Exploration NL. In Envelope 4505*).

MINERALISATION / PROSPECTS:
Nillinghoo Goldfield: Kirkeek's Treasure Gold Mine
In 8-9 April 1974, North Broken Hill signed options with the lease and claim holders at Kirkeek's Treasure, and undertook exploration over the mine area:
J. Michaelevs: MC 283, MC 284, ML 4106
R.D. Mildenhall: MC 250, ML 4244
H.W. Rademaker: MC 246, MC 247, ML 4209
(*Mayer, T.E., January 1975?. Investigation of the Kirkeek's Treasure Mine, Koonamore Station, near Yunta SA. North Broken Hill Ltd, EL 939 Mt Victor. In Envelope 4505*).

DRILLING:
Previous drilling by North Broken Hill at Kirkeek's Treasure:
diamond drillhole to 106.68m depth, angled $45^{0,}$ intersected pyritic dolomitic siltstone averaging 0.4 ppm Au from 69.8 to 73.2m.
Previous drilling by CRAE at Kirkeek's Treasure:
4 diamond drillholes (KTD1-4) totalling 372.35m; KTD2 intersected 9m (26-35m) at 3.51 ppm Au
October 1980: 77 percussion drillholes at Kirkeek's Treasure, totalling 760.5m at 5m spacing on 3 lines 50m apart; 3 holes averaged better than 1 ppm Au

Drilling by Barrier Exploration NL:
August-September 1984:
12 angled RC percussion drillholes (MV84/1-12), totalling 708m
In February - April 1985:
43 RAB drillholes totalling 448m
15 angled RC percussion drillholes (MV85/1-15) totalling 778m

| | |
|---|---|
| TENEMENT: | EL 942 Mount Misery |
| COMPANY: | UTAH DEVELOPMENT COMPANY |
| taken over in April 1984 by | THE BROKEN HILL PROPRIETARY CO. LTD |

Formerly:

| | |
|---|---|
| SML 479 Mannahill, | ELVIRE P/L |
| SML 635 Mannahill, | ELVIRE P/L |
| EL 530 Yardlowie - Mannahill, | CRA EXPLORATION P/L |
| EL 584 Mount Victor, | CRA EXPLORATION P/L |

Followed by:

| | |
|---|---|
| EL 1161 Mannahill Goldfield, | JARMAND MINERALS & EXPLORATION P/L |
| EL 1164 Mannahill, | AMAX AUSTRALIA (GOLD) P/L |
| EL 1322 Teetulpa, | WESTERN MINING CORPORATION LTD |
| EL 1334 Wattle Dam, | WESTERN MINING CORPORATION LTD |
| EL 1346 Mannahill, | WESTERN MINING CORPORATION LTD |
| EL 1376 Hope Bank, | CRA EXPLORATION P/L |
| EL 1436 Mannahill, | HALLMARK GOLD NL |

| | |
|---|---|
| AREA: | 927 sq km, reducing to 377 sq km in June 1985 |
| COMMENCEMENT DATE: | 30.11.81 |
| EXPIRY DATE: | 29.11.85 |
| ENVELOPE: | Envelope 4547 Open File<br>Envelope 6127 Open File |
| DATA PLACED ON OPEN FILE: | June 1985 |
| REFERENCES: | - |
| LOCATION: | south of Olary |
| 1:250 000 SHEET: | OLARY, ORROROO |
| 1:100 000 SHEET: | Winnininnie 6833, Koonamore 6733, Paratoo 6732 |
| TARGETS: | stratiform / stratabound Au (chemically precipitated Telfer-style) |
| AGE/ROCK UNITS: | Neoproterozoic Adelaidean Umberatana Group, especially Cox Sandstone Member |

EXPLORATION SUMMARY:

Exploration targeted chemically precipitated stratabound Telfer-style Au in Tarcowie Siltstone / Cox Sandstone Member in the Waukaringa Syncline and Black Hill Anticline. Known Au mineralisation is focussed at the contact between the Tapley Hill Formation and overlying Tarcowie Siltstone, with the prominent but laterally discontinuous Cox Sandstone Member at the contact.

Exploration included regional geological mapping, and mapping of sampling traverses. A total of 456 soil and rock-chip samples were collected on 10 traverses MM001 to MM010 across Cox Sandstone Member, along strike from Waukaringa Goldfield and Ajax Mine (on ORROROO 1:250 000 map sheet), and were analysed for Ba, As, Cu, Pb, Zn, Bi, Mn, Ag, and Au. Best Au was 0.16 ppm from a ferruginous siltstone with wavy lamination. Assays on a further 660 soil and rock-chip samples on 19 follow-up traverses (MM011 - MM029) across the contact between Tapley Hill Formation and overlying Tarcowie Siltstone Member indicated weak Au anomalism in several zones.

97 stream sediment samples returned a maximum of 0.024 ppm Au (*Jarvis, D.M., and P. Wright, June 1985. Exploration Licence 942, Mt Misery, South Australia: Partial Surrender Report, June 1985. Utah Development Co. In Envelope 6127*). Orientation stream and soil sediment sampling near and downstream from known Au workings indicated only low-level Au anomalism, but that both sampling techniques were useful exploration tools (*Wright, P., November 1983. Quarterly Report on Exploration, EL 942 - Mt Misery, for the Period Ending 29.11.83. Utah Development Co. In Envelope 4547*).

In October 1982, angled diamond drillhole MD001 was completed to 440m depth (relevant quarterly report is missing / not submitted).

In early 1983, 2 auger traverses (MT030, MT031) were completed across strike, but Au (and As and Ba - pathfinder elements for Au) values were low (*Circosta, G., August 1983. Quarterly Report on Exploration, EL 942 - Mt Misery, for the Period Ending 28.8.83. Utah Development Co. In Envelope 4547*).

In mid-late 1983, 3 angled diamond drillholes (MD002 to 004, totalling 1256.6m) and 7 angled percussion drillholes (MP001 to 007, totalling 1548m) were targeted at Tarcowie Siltstone (overlain by Waukaringa Siltstone, and underlain by Tapley Hill Formation), along strike from Waukaringa Goldfield and Ajax Mine. Samples were assayed for Au, Cu, Pb, Zn, Ag, Ba, As, Mn; geochemical results were low, with the exception of anomalous Cu, As, Mn from 20 to 80m in MP005 (Cu and As are known pathfinder elements for Au at Waukaringa and Ajax) (*Wright, P., November 1983*).

In early 1984, angled diamond drillhole MD005 was completed to 400m along strike from MP005 in Tarcowie Siltstone on the northern limb of the Waukaringa Syncline; the hole intersected 7 possible exhalative quartz-rich horizons between 125 and 310m.

A regional stream sediment sampling (97 samples, assayed for Au, Cu, Pb, Zn, Co, Ag, As, Ba, Ti) tested Au in the tillites in Umberatana Group (Appila Tillite and Pepuarta Tillite); 12 rock-chip samples were collected over the Black Hill Anticline (*Jarvis, D.M., May 1984. Quarterly Report on Exploration, EL 942 - Mt Misery, for the Period 1.3.1984 - 29.5.84. Utah Development Co. In Envelope 4547*).

The last phase of exploration included detailed geological mapping and rock-chip sampling on 17 traverses across strike, sampling of Tertiary gravels for Au
infill and follow-up stream sediment sampling. BHP concluded that Au was associated with discordant to concordant ferruginous quartz veining, especially in the anticlinal core, assumed to derive from Delamerian hydrothermal fluids. In addition, 33 heavy mineral samples and 17 loam samples failed to reveal kimberlitic indicator minerals (*Mann, S.T., January 1986. Exploration Licence 942, Mt Misery - South Australia, Final Report, January 1986. The BHP Co Ltd, Report No CR 4870. In Envelope 4547*).

MINERALISATION / PROSPECTS:
Waukaringa Goldfield and Ajax Mine (adjacent to EL 942, on ORROROO 1:250 000 map sheet)

DRILLING:

| | |
|---|---|
| October 1982: | angled diamond hole MD001 to 440m |
| early 1983: | 2 auger traverses (MT030, MT031) across strike |
| mid-late 1983: | 3 angled diamond holes (MD002 to 004), totalling 1256.6m |
| | 7 angled percussion holes (MP001 to 007), totalling 1548m |
| early 1984: | angled diamond hole MD005 to 400m (along strike from MP005) |

| | |
|---|---|
| TENEMENT: | EL 1098 Teetulpa Goldfield |
| COMPANY: | JARMAND MINERALS & EXPLORATION PTY LTD |
| Joint Venture with | AMINCO & ASSOCIATES PTY LTD |
| Formerly: | - |
| Followed by: | |
| EL 1226 Teetulpa Goldfield, | JARMAND MINERALS & EXPLORATION P/L |
| EL 1322 Teetulpa Goldfield, | WESTERN MINING CORPORATION LTD |
| EL 1413 Teetulpa Goldfield, | THOMDRILL P/L |
| EL 1490 Teetulpa Goldfield, | COVE MINING NL |
| EL 2126 Teetulpa Goldfield, | MINTECH RESOURCES P/L |
| AREA: | 287 sq km |
| COMMENCEMENT DATE: | 07.01.83 |
| EXPIRY DATE: | 06.01.84 |
| ENVELOPE: | 5023 Open File |
| DATA PLACED ON OPEN FILE: | 1985 |
| REFERENCES: | - |
| LOCATION: | 35 km northeast of Yunta |
| 1:250 000 SHEET: | OLARY |
| 1:100 000 SHEET: | Winnininnie 6833 |
| TARGETS: | Au |
| AGE/ROCK UNITS: | Neoproterozoic Adelaidean, especially Wilyerpa Formation and Tindelpina Shale / Tapley Hill Formation. |

EXPLORATION SUMMARY:
East-west striking auriferous quartz veins at Teetulpa have not been successfully exploited historically. Exploration, targeting both stratabound and structurally controlled Au, included geological mapping and 29 chip or channel rock samples. Rapid Reconnaissance Magnetic Induced Polarisation (RRMIP) surveys (four 1.2 km arrays, and one 800m array) were completed in December 1982, and delineated steeply dipping conductors usually coincident with (gossanous, and Cu- and Au-bearing) quartz-sulphide outcrop.

Photo-geological interpretation, and reinterpretation of 1980 Geoex Pty Ltd aeromagnetics indicated a northwest-southeast magnetically-disturbed zone immediately north of Teetulpa Goldfield, cutting across the Waukaringa Syncline; the magnetic pattern is reminiscent of Willyama Complex Palaeoproterozoic basement. In addition, the aeromagnetics indicate a large (20 km) dome of moderate to high magnetics (Tindelpina Shale Member?) further to the north, cut by the auriferous Teetulpa Fracture Zone; this was interpreted as having possible Telfer-style affinities, perhaps indicating a larger stratabound Au deposit beneath the dome (*Seymour, D.L., November 1983. Exploration Licence 1098, Quarterly Report for the Period Ended 30th September 1983. Jarmand Minerals and Exploration Pty Ltd. In Envelope 5023*).

Over the dome, cleavage-controlled east-northeast to slightly radial? quartz veining is not auriferous. Two Petrex K-V Fingerprint sampling traverses (a hydrocarbon detection technique which has also given anomalous results over known Au mineralisation) were trialed across the dome, but no results were reported.

Further work is reported under EL 1226 Teetulpa.

MINERALISATION / PROSPECTS: Teetulpa Goldfield

DRILLING: Nil

| | |
|---|---|
| TENEMENT: | EL 1102 Copperlinka |
| COMPANY:<br>taken over in April 1984 by | UTAH DEVELOPMENT COMPANY<br>THE BROKEN HILL PROPRIETARY CO LTD |
| Formerly: | - |
| Followed by:<br>EL 1479 Copperlinka,<br>EL 1711 Copperlinka,<br>EL 2185 Outalpa, | <br>BHP MINERALS LTD<br>AZTEC MINING CO LTD<br>OXFORD RESOURCES P/L |
| AREA: | 530 sq km, reducing to 165 sq km on 03.01.85 |
| COMMENCEMENT DATE: | 24.01.83 |
| EXPIRY DATE: | 23.01.88 |
| ENVELOPE: | Envelope 5020 Open File<br>Envelope 6292 Open File (partial relinquishment) |
| DATA PLACED ON OPEN FILE: | November 1985 |
| REFERENCES: | - |
| LOCATION: | 10 km south of Olary |
| 1:250 000 SHEET: | OLARY |
| 1:100 000 SHEET: | Anabama 6932, Olary 6933 |
| TARGETS: | Stratabound Au, base metals (Cu, Pb, Zn) |
| AGE/ROCK UNITS: | Neoproterozoic Adelaidean Umberatana Group and Burra Group |

EXPLORATION SUMMARY:

Exploration was conducted in conjunction with adjacent EL 1163 Giles Nob, and EL 1234 Round Hill.

Grab samples (12) from old Au workings and detailed geological mapping at 1:25000 and 1:10000 scale was followed by 3217 shallow RAB drillholes (averaging 2.5m deep) at 5m centres on 11 traverses 1000m to 5000m long (for a total of 3207 samples), and 218 Gemco auger holes averaging 3.5m deep (201 samples). Samples were analysed for Au, Ag, Cu, Pb, Zn, As, and some for Mn, Co, Sb, Ba. Few returned positive Au values. Low level Zn anomalism, from 180 to 450 ppm Zn, was recorded at 9 locations

A traverse of 70 rock-chip samples, and 36 grab samples mostly from dumps at Wadnaminga, indicated that As and Pb were good pathfinder elements for Au, and Cu and Zn were weak pathfinders (*Pointon, T., October 1983. Quarterly Report on Exploration EL 1102 - Copperlinka, Period Ended 23.10.83. Utah Development Co. In Envelope 5020*).

In May - June 1984, 4 diamond drillholes were completed totalling 751.6m, from which 769 samples were analysed:
CD001, at Copperlinka Mine, dipping $60^0$, 179.5m depth
CD002, at Great Eastern, vertical, 118.7m depth
CD003, at North and South Mine, dipping $65^0$, 151.8m depth
CD004, at New Milo, vertical, 301.6m depth.

In August 1984, diamond drillhole CD005 (dipping $60^0$, 158.6m depth) was completed at Two Mile Dam, on the northern limb of a regional syncline, targeting a stacked arenite sequence with rare Cu stained quartz scree near the top of Tarcowie Siltstone / Cox Sandstone Member; the hole intersected rare quartz stringers and pyrite cubes in fine grained quartzitic sandstone to sandy siltstone; due to the absence of significant veining etc, samples were not assayed (*Mann, S.T., October 1984. Quarterly Report for EL 1102 - Copperlinka, for the Period 24.7.84 - 23.10.84. Utah Development Co. In Envelope 5020*).

A high resolution aeromagnetic survey (990 sq km, 3980 line km) was flown in 1984 by Aerodata Pty Ltd (but not discussed) over part EL 1102 and parts of adjacent ELs 1163, 1234. In 1984, 509 samples were collected on traverses at 200m spacing at Echelon Grid (107 rock-chip, 208 soil, 13 stream sediment) and Gorge Grid (54 rock-chip, 120 soil, 7 stream sediment), and analysed for Cu, Pb, Zn, Ag, Au, As; results were generally low, but a few were anomalous with a best sample containing 930 ppm Cu, 1.48% Pb, and 4000 ppm Zn.. Ongoing mapping at Gorge Grid indicated variable Au and base-metal mineralisation in the Lower Glacials / Warcowie Dolomite Member equivalent, Benda Siltstone, and Pualco Tillite, and the potential for large-scale placer Au mineralisation

Follow-up work included ongoing geological mapping at 1:10,000 scale, and in early 1985, a further 3 stream sediment samples and 10 rock-chip samples were collected from Wadnaminga Goldfield and from the Lower Glacial sequence indicated only minor Au anomalism.

A unit containing a distinctive quartz stockwork was informally named the *Honeycomb Unit*, comprising up to 10 thin quartz-albite-dolomite layers within phyllitic siltstone over a 400m (or less) stratigraphic interval (well developed near New Milo), and containing low-level Au anomalism (42 rock-chip samples analysed for Cu, Pb, Zn, Ag, Au), in particular where cut by quartz veining. A ground magnetics traverse was completed across New Milo workings. In August 1986 a short orientation radiometric survey was completed on EL 1102, EL 1163 Giles Nob, and EL 1234 Round Hill.

Auger sampling (71 samples to a maximum of 2.8m depth) of tailings at New Milo and Virginia (Wadnaminga Goldfield) in 1987 indicated grade and tonnages were low (*Lindeman, T, April 1989. Exploration Licence 1479 Copperlinka, South Australia, Final Report. BHP - Utah Minerals International, Report No CR 6420. In Envelope 5020*).

MINERALISATION / PROSPECTS:
includes part of Wadnaminga Goldfield: New Milo
Great Eastern
Virginia
North and South Mine
Copperlinka Mine
Echelon Prospect

NAMED GRIDS etc:
Gorge Grid

DRILLING:
mid 1983:
3217 shallow RAB holes (averaging 2.5m deep) at 5m centres on 11 traverses 1000m to 5000m long
218 Gemco auger holes averaging 3.5m deep
May - June 1984: 4 diamond holes:
DDH CD001, at Copperlinka Mine, dipping $60^0$, 179.5m depth
DDH CD002, at Great Eastern, vertical, 118.7m depth
DDH CD003, at North and South Mine, dipping $65^0$, 151.8m depth
DDH CD004, at New Milo, vertical, 301.6m depth.
August 1984:
diamond hole DDH CD005 at Two Mile Dam, dipping $60^0$, to 158.6m.

1987:
auger sampling (71 holes, maximum 2.8m depth) of tailings at New Milo, Virginia.

| | |
|---|---|
| TENEMENT: | EL 1161 Mannahill Goldfield |
| COMPANY: | JARMAND MINERALS & EXPLORATION PTY LTD<br>CSR LTD, joint venture partners from 07.02.84 |

Formerly:

| | |
|---|---|
| SML 635 Mannahill, | ELVIRE P/L |
| EL 363, Mannahill Goldfield, | NEWMONT P/L |
| EL 530 Yardlowie - Mannahill, | CRA EXPLORATION P/L |
| EL 942 Mount Misery, | UTAH DEVELOPMENT CO |

Followed by:

| | |
|---|---|
| EL 1164 Mannahill, | AMAX AUSTRALIA (GOLD) P/L |
| EL 1322 Teetulpa, | WESTERN MINING CORPORATION LTD |
| EL 1334 Wattle Dam, | WESTERN MINING CORPORATION LTD |
| EL 1346 Mannahill, | WESTERN MINING CORPORATION LTD |
| EL 1376 Hope Bank, | CRA EXPLORATION P/L |
| EL 1436 Mannahill, | HALLMARK GOLD NL |
| EL 1961 Yunta - Mannahill, | EQUINOX RESOURCES NL |
| EL 2191 Mannahill, | NORSCOM P/L |

| | |
|---|---|
| AREA: | 174 sq km |
| COMMENCEMENT DATE: | 08.07.83 |
| EXPIRY DATE: | 07.07.85 |
| ENVELOPE: | 5260 Open File |
| DATA PLACED ON OPEN FILE: | July 1985 |
| REFERENCES: | - |
| LOCATION: | Mannahill Goldfield (adjacent to EL 1164, 1226) |
| 1:250 000 SHEET: | OLARY |
| 1:100 000 SHEET: | Winnininnie 6833 |
| TARGETS: | Au |
| AGE/ROCK UNITS: | Neoproterozoic / Adelaidean Sturtian Umberatana Group, especially Enorama Shale |

EXPLORATION SUMMARY:

Field mapping and photo-geology, initially by Aminco & Associates Pty Ltd on behalf of Jarmand, comprised geological description and assessment at 14 mines or prospects at Mannahill Goldfield (*Seymour, D.L., March 1984, Mannahill Goldfield Joint Venture, Progress Report., Aminco & Associates Pty Ltd. In Envelope 5260*), within Enorama Shale, along the northern limb of the Winnininnie Syncline, a major regional fold structure. Sampling included BLEG stream sediment (21 samples), soil sampling along traverses (13 samples on a traverse at Westward Ho! & 13 samples on a traverse at Homeward Bound), and analysis of magnetic concentrates from stream sediment samples for As and Sb (as indicators of epigenetic Au); 15 samples were submitted for petrographic description. Stream sediment sampling detected only the known Au mineralisation, and soil sampling at Westward Ho! detected a wide dispersion of Au and trace elements around the mineralised horizon for up to 150m (perhaps indicating windborne contamination from mine dumps), with minimal dispersion at Homeward Bound. Based on prior drilling by Newmont (EL 363, reported in this volume), resources were estimated at:

| | strike | dip | thickness | tonnage |
|---|---|---|---|---|
| Westward Ho! | 1100m | 100m | 1m | 0.3 Mt |
| Elsie May syncline | 900m | 400m | 1m | 1.0 Mt |
| Eudunda Hope / Jackson's | 1600m | 100m | 1m | 0.4 Mt |

Assuming an average grade of 2.5 g/t, this contains ' total recoverable gold just in excess of 4 tonnes" (*Seymour, D.L., April 1984, Letter to CSR, Mannahill Ore Potential, Aminco & Associates Pty Ltd. In Envelope 5260*).

Mapping and sampling were unsuccessful in delineating structural or stratigraphic extensions or repeats of Au mineralisation at Mannahill. Mapping indicated a model for mineralisation: a precursor stromatolitic dolomite bed within Enorama Shale in which structurally induced permeability was developed during Delamerian folding; fluids emanating from the Teetulpa Fracture Zone 4 km to the west (probably derived from a magmatic source) and migrating up the plunge axis of the regional D5 folding, initially silicified the unit and subsequently introduced the gold mineralisation (in quartz-siderite-sulphide veining) with concurrent recrystallisation of the earlier replacive quartz (*Curtis, J.L., December 1986. Exploration Licence 1161, Relinquishment Report, Mannahill area, South Australia. CSR Ltd. In Envelope 5260*)

MINERALISATION / PROSPECTS:

| | |
|---|---|
| Mannahill Goldfield: | Westward Ho! |
| | Elsie May |
| | Eudunda Hope |
| | Jackson's Pile |
| | Jackson's |
| | Euro |
| | Odd Trick |
| | Homeward Bound |
| | Trojan |
| | Birthday |
| | Aurora Australis |
| | Starlight Dam |
| | Nectar |
| | No Gammon |

DRILLING: Nil

| | |
|---|---|
| TENEMENT: | EL 1163 Giles Nob |
| COMPANY: | UTAH DEVELOPMENT COMPANY |
| taken over in April 1984 by | THE BROKEN HILL PROPRIETARY CO. LTD |
| Formerly: | |
| SML 556 Wadnaminga, | MINES ADMINISTRATION P/L |
| | joint venture partners LONGREACH METALS NL |
| EL 16 Anabama, | SADM |
| EL 173 Anabama Hill, | SADM |
| Followed by: | |
| EL 1528 Giles Knob, | BATTLE MOUNTAIN (AUSTRALIA) INC |
| AREA: | 200 sq km |
| COMMENCEMENT DATE: | 08.07.83 |
| EXPIRY DATE: | 07.07.88 |
| ENVELOPE: | Envelope 5215 Open File Volume IV (Volumes I-III not in file) |
| | Envelope 5644 Open File (EL 1234 Round Hill) |
| DATA PLACED ON OPEN FILE: | 1988? |
| REFERENCES: | - |
| LOCATION: | 25 km south of Olary |
| 1:250 000 SHEET: | OLARY |
| 1:100 000 SHEET: | Anabama 6932 |
| TARGETS: | Au |
| AGE/ROCK UNITS: | Burra Group metasediments, intruded by greisenized Cambro-Ordovician granitoids |
| Note: | See EL 1102 for Locality Plan |

EXPLORATION SUMMARY:
Exploration was conducted in conjunction with adjacent EL 1102 Copperlinka and EL 1234 Round Hill.

Exploration commenced with detailed geological mapping and rock-chip and grab sampling (113 samples) in the Taltabooka - Goode Hill area and Thunder Queen - Wadnaminga Goldfield area, followed by 571 RAB drillholes totalling 1775.7m on 2 traverses with holes at 5m centres along strike from known workings, 683 auger drillholes totalling 1664.85m on 5 traverses. Samples were assayed for Cu, Pb, Zn, Mn, As, Ag, Au and recorded many values in excess of 1 ppm Au, with a peak value of 45 ppm Au (*Circosta, G., October 1983. Quarterly Report on Exploration in Giles Nob - EL 1163, for Period 8.7.83 - 7.10.83. Utah Development Co. In Envelope 5215*). In October 1983, 2 diamond drillholes, totalling 145m were completed near Thunder Queen Mine (GD001), and near Cordierite Mine near Goode Hill (GD002):
GD001 to test the down dip extension of the quartz lode at the mine intersected thin cross-cutting quartz-sulphide veins in sandy dolomitic pyritic and pyrrhotitic siltstone; Au was mostly low, but with one value of 3.7 ppm Au.
GD002 intersected schistose dolomitic siltstone and minor mafic igneous rocks; low level anomalous Au (up to 0.47 ppm) was associated with weakly anomalous Cu, Pb, Zn, Mn, As (*Circosta, G., February 1984. Quarterly Report on Exploration, Giles Nob - EL 1163, for Period 08.10.83 - 07.01.84. Utah Development Co. In Envelope 5215*).

In June-August 1984, a further 14 diamond drillholes (GD003 - 016) totalling 586.2m tested down dip extension of known mineralised zones at Wadnaminga and Taltabooka:
GD003 (251.3m), 350m south of Victoria Tower Mine, intersected quartz-sulphide (pyrite - pyrrhotite with rare galena and chalcopyrite) veins up to 3.9m wide in dolomitic (and pyritic) siltstones.
GD004 (121.2m), 1.3 km west of GD003 , and intersecting the same stratabound lode.
GD005 (109.7m, angled $60^0$), 100m west of Oulnina Tower Mine (Wadnaminga Goldfields) and intersecting the same stratabound lode as GD002, GD003

GD006 (104.0m), Taltabooka Goldfield, intersected a 2m zone of brecciated limonitic quartz at 65m.
GD007 (138.3m),
GD008 (111.6m, angled $60^0$),
GD009 (129.7m, angled $60^0$),
GD010 (118.4m, angled $60^0$),
GD011 (105.0m, angled $60^0$),
GD012 (105.4m),
GD013 (117.4m, angled $60^0$),
GD014 (27.1m, angled $60^0$), abandoned in caving ground
GD015 (112.0m, angled $60^0$),
GD016 (122.0m),
(*Mann, S., August 1984. Quarterly Report on Exploration, Giles Nob - EL 1163, for Period 8.4.84 - 7.7.84. Utah Development Co. In Envelope 5215*, and *Mann, S., October 1984. Quarterly Report on Exploration, Giles Nob - EL 1163, for Period 8.7.84 - 7.10.84. BHP Minerals Ltd. In Envelope 5215*).
Significant Au results were:
GD006, 0.8m (at 64.9m) at 1.13 ppm Au
GD008, 1m (at 55.4m) at 2.31 ppm Au
GD010, 3m (at 21m) at 0.5 ppm Au

In 1984, a high resolution aeromagnetic survey (990 sq km, 3980 line km) was completed by Aerodata Pty Ltd over EL 1163 and parts of adjacent ELs 1102, 1234, and was followed in early 1985 by a RAB drilling program (in conjunction with drilling on EL 1234 Round Hill adjacent to the south) of 192 holes totalling 1167.4m on traverse RT001 (*Mann, S.T., July 1985. Exploration Licence 1234, Round Hill - South Australia, report for the Quarter Ended 15th July 1985. BHP Minerals. In Envelope 5644*). In August 1986 a short orientation radiometric survey was completed on EL 1163, EL 1102 Copperlinka, and EL 1234 Round Hill.

MINERALISATION / PROSPECTS:
Wadnaminga Goldfield
- Victoria Towers
- Oulnina Tower Mine
- Thunder Queen Mine

Taltabooka - Goode Hill
- Esmonde / Faugh-a-Ballagh
- Cordierite Mine

Commodore /Prince Albert Mine

DRILLING:
October 1983, 2 diamond drillholes:
- GD001 (91m) near Thunder Queen Mine
- GD002 (54m) near Cordierite Mine

June -August 1984, 14 diamond drillholes totalling 586.2m at Wadnaminga and Taltabooka
- GD003 (251.3m) south of Victoria Tower Mine
- GD004 (121.2m) west of Victoria Tower Mine
- GD005 (109.7m) west of Oulnina Tower Mine
- GD006 (104.0m) Taltabooka Goldfield
- GD007 (138.3m)
- GD008 (111.6m, angled $60^0$)
- GD009 (129.7m, angled $60^0$)
- GD010 (118.4m, angled $60^0$)
- GD011 (105.0m, angled $60^0$)
- GD012 (105.4m)
- GD013 (117.4m, angled $60^0$)
- GD014 (27.1m, angled $60^0$)
- GD015 (112.0m, angled $60^0$)
- GD016 (122.0m)

early 1985:192 RAB drillholes totalling 1167.4m.

| | |
|---|---|
| TENEMENT: | EL 1164 Mannahill |
| COMPANY: | AMAX AUSTRALIA (GOLD) PTY LTD<br>name change to AUSTAMAX GOLD PTY LTD |

Formerly:

| | |
|---|---|
| SML 635 Mannahill, | ELVIRE P/L |
| EL 363, Mannahill Goldfield, | NEWMONT P/L |
| EL 530 Yardlowie - Mannahill, | CRA EXPLORATION P/L |
| EL 942 Mount Misery, | UTAH DEVELOPMENT CO |
| EL 1161 Mannahill Goldfield, | JARMAND MINERALS & EXPLORATION P/L |

Followed by:

| | |
|---|---|
| EL 1322 Teetulpa, | WESTERN MINING CORPORATION LTD |
| EL 1334 Wattle Dam, | WESTERN MINING CORPORATION LTD |
| EL 1346 Mannahill, | WESTERN MINING CORPORATION LTD |
| EL 1376 Hope Bank, | CRA EXPLORATION P/L |
| EL 1436 Mannahill, | HALLMARK GOLD NL |
| EL 1961 Yunta - Mannahill, | EQUINOX RESOURCES NL |

| | |
|---|---|
| AREA: | 2365 sq km, reducing to 1219 sq km on 08.08.84 |
| COMMENCEMENT DATE: | 08.07.83 |
| EXPIRY DATE: | 27.11.84 (surrendered) |
| ENVELOPE: | 5211 Open File |
| DATA PLACED ON OPEN FILE: | November 1984 |
| REFERENCES: | - |
| LOCATION: | Surrounding the Mannahill - Teetulpa Goldfields - Mount Victor area, from Olary - Mannahill townships west to Koonamore |
| 1:250 000 SHEET: | OLARY, ORROROO |
| 1:100 000 SHEET: | Olary 6933, Winnininnie 6833, Anabama 6932; Koonamore 6733 |
| TARGETS: | Telfer-style stratabound / stratiform Au |
| AGE/ROCK UNITS: | Neoproterozoic / Adelaidean Sturtian metasediments |

EXPLORATION SUMMARY:

Exploration on EL 1229 was carried out in conjunction with nearby EL 1227 Baratta (on ORROROO 1:250 000 map sheet) and EL 1229 Boikevie Hill (reported in this volume).

Exploration commenced with an orientation survey comprising rock-chip sampling (33 samples) at Kings Bluff (2 samples) and at similar mines / prospects outside the EL (Mannahill; and Mount Grainger , Ajax, Waukaringa on ORROROO 1:250 000 map sheet), and underground sampling at Mount Grainger and Waukaringa (16 samples), stream sediment sampling (16 samples), and reinterpretation of aeromagnetics - based on the known magnetic character of the mineralised zone at Waukaringa, based on its pyrrhotite content (*Bull, P.F., October 1983. Quarterly Report on Exploration Licence 1164 Mannahill for the Period Ended 8th October 1983. Amax Australia (Gold) Pty Ltd. In Envelope 5221*).

Based on the orientation geochemistry, Amax concluded that 0.3 ppm Au comprised a threshold value for anomalous Au in stream sediment sampling for further exploration. A comprehensive review of previous exploration (especially CRA, ELs 530, 584) and Telfer-style exploration concepts was completed.

Chip and soil sampling at a number of small un-named prospects, mostly on quartz veins, yielded anomalous Au, and/or Pb-Ag-Zn, and bulk soil samples (32) were collected on an east-northeast trending 4000 m by 600m grid (Anomaly 62) with lines at 400m spacing and samples bulked over 200m, in the vicinity of 2 prospects 10 km southeast of Mount Victor, in an area of Tarcowie Siltstone? (Farina Subgroup). Assay values for Zn, Au, and Ag were low and unrelated to known mineralisation, and Austamax concluded that surficial deposits were obscuring

bed-rock. Exploration failed to reveal any possibilities for economic Telfer-style Au mineralisation (*Wyatt, D.H., October 1984. Final Report EL 1164 Mannahill, South Australia. Austamax Gold Pty Ltd. In Envelope 5221*).

MINERALISATION / PROSPECTS:
Within EL 1164:
Kings Bluff Goldfield
Boomerang Gold Mine (16 km NE of Mannahill)
Outalpa Mine

Adjacent to EL 1164:
Mannahill Goldfield: Homeward Bound
Eudunda Hope
Elsie May
Westward Ho!
Teetulpa Goldfield
Nillinghoo Goldfield: Kirkeek's Treasure Mine
Waukaringa Goldfield (on ORROROO 1:250 000 map sheet)
Ajax Au Mine (on ORROROO 1:250 000 map sheet)
Mount Grainger (on ORROROO 1:250 000 map sheet)

DRILLING: Nil

| | |
|---|---|
| TENEMENT: | EL 1226 Teetulpa Goldfield |
| COMPANY: | JARMAND MINERALS & EXPLORATION PTY LTD |
| Joint Venture with | CSR LTD |
| Formerly: | |
| EL 1098 Teetulpa Goldfield, | JARMAND MINERALS & EXPLORATION P/L |
| Followed by: | |
| EL 1322 Teetulpa Goldfield, | WESTERN MINING CORPORATION LTD |
| EL 1413 Teetulpa Goldfield, | THOMDRILL P/L |
| EL 1490 Teetulpa Goldfield, | COVE MINING NL |
| EL 2126 Teetulpa Goldfield, | MINTECH RESOURCES P/L |
| AREA: | 287 sq km |
| COMMENCEMENT DATE: | 02.04.84 |
| EXPIRY DATE: | 01.04.85 |
| ENVELOPE: | 5023 Open File |
| DATA PLACED ON OPEN FILE: | 1985? |
| REFERENCES: | - |
| LOCATION: | Mount Victor - Four Brothers Homestead area, Teetulpa Goldfield, 35 km northeast of Yunta |
| 1:250 000 SHEET: | OLARY |
| 1:100 000 SHEET: | Winnininnie 6833 |
| TARGETS: | Telfer-style stratabound / stratiform Au |
| AGE/ROCK UNITS: | Neoproterozoic Adelaidean, especially Appila Tillite - Wilyerpa Formation, Tindelpina Shale - Tapley Hill Formation |

EXPLORATION SUMMARY:
The exploration model over the structural dome (informally named the Four Brothers Anticline) north of Teetulpa Goldfield (as indicated by aeromagnetic reinterpretation, under EL 1098) “envisaged the doming of a pyritic sedimentary succession. Differential competence between adjacent units caused fracturing and bedding plane slippage, resulting in lateral strata-bound permeability. Brittle units developed cross-cutting fractures. Subsequent thermal convection of brines, along regionally penetrative fracture systems, introduced gold bearing solutions into the dome”. Exploration focussed on Wilyerpa Formation overlain by Tindelpina Shale (a pyritic cap unit) , an inferred structural locus for stratabound gold-sulphide mineralisation.

Exploration included reconnaissance geological mapping, photo-geological interpretation, and BLEG stream sediment sampling; only one sample contained weakly anomalous Au, Ag, Cu. Rock-chip sampling over the old Bumbumbie Hills prospect indicated Au up to 4.10 ppm, and regional rock sampling of Wilyerpa Formation and Tindelpina Shale indicated minor Cu enrichment on the northern limb of Black Hill Anticline.

Reprocessing of aeromagnetic data, based on the observation that Tindelpina Shale to the east has a characteristic magnetic signature, was followed by 4 ground magnetics to confirm the Wilyerpa Formation - Tindelpina Shale contact.

In late 1984, 2 rotary drillholes (Teetulpa 1 & 2, southeast and southwest of Four Brothers Homestead), totalling 251m, intersected laminated calcareous shales, but failed to intersect the targeted Tindelpina Shale / Wilyerpa Formation contact. Base metal values were low, with only minor supergene enrichment; only composite full-hole samples were submitted for assay, but Au was low (*Curtis, J.L., November 1985. Relinquishment Report on Exploration Licence 1226 Teetulpa Area, SA. CSR Ltd, Minerals Exploration and Development Group. In Envelope 5023*).

MINERALISATION / PROSPECTS:
Teetulpa Goldfield
Bumbumbie Hills prospect

DRILLING:
late 1984: 2 rotary drillholes (Teetulpa 1 & 2) totalling 251m.

| | |
|---|---|
| TENEMENT: | EL 1229 Boiekevie Hill |
| COMPANY: | AMAX AUSTRALIA (GOLD) PTY LTD<br>Name change to AUSTAMAX GOLD PTY LTD |
| Formerly: | - |
| Followed by: | - |
| AREA: | 291 sq km |
| COMMENCEMENT DATE: | 09.04.84 |
| EXPIRY DATE: | 10.09.84 (surrendered) |
| ENVELOPE: | 5594 Open File |
| DATA PLACED ON OPEN FILE: | September 1984 |
| REFERENCES: | - |
| LOCATION: | Pualco Range and Levi Hills, 35 to 65 km south of Yunta |
| 1:250 000 SHEET: | OLARY, CHOWILLA |
| 1:100 000 SHEET: | Yunta 6832, Murkaby 6831 |
| TARGETS: | Low grade, stratabound Au |
| AGE/ROCK UNITS: | Neoproterozoic Adelaidean, Umberatana Group |

EXPLORATION SUMMARY:
Exploration on EL 1229 was carried out in conjunction with nearby EL 1164 Mannahill (reported in this volume) and EL 1227 Baratta (on ORROROO 1:250 000 map sheet).

Exploration included stream sediment and soil sampling (33 samples) across the EL for Au, and 10 samples for Au (or An?; the report is conflicting), Ag, As, Cu, Pb, An. Results were disappointing, with only 3 sample recording better than 0.3 ppb Au, and a maximum of 540 ppm Cum 65 ppm Pb and 40 ppm As (*Wyatt, D.H., July 1984. Final and Quarterly Report on Exploration Licence 1229, Boiekevie Hill, South Australia, for the Three Month Period Ended 8 July 1984. Austamax Gold Pty Ltd. In Envelope 5594*).

MINERALISATION / PROSPECTS: Nil

DRILLING: Nil

| | |
|---|---|
| TENEMENT: | EL 1234 Round Hill |
| COMPANY:<br>taken over in April 1984 by | UTAH DEVELOPMENT COMPANY<br>THE BROKEN HILL PROPRIETARY CO. LTD |
| Formerly:<br>EL 16 Anabama,<br>EL 173 Anabama Hill,<br>EL 753 | <br>SADM<br>SADM<br>Anabama Hill, CSR Ltd |
| Followed by:<br>EL 1838 Lilydale, | <br>DOMINION GOLD OPERATIONS P/L |
| AREA: | 835 sq km |
| COMMENCEMENT DATE: | 16.04.84 |
| EXPIRY DATE: | 15.04.88 |
| ENVELOPE: | 5644 Open File |
| DATA PLACED ON OPEN FILE: | December 1988 |
| REFERENCES: | - |
| LOCATION: | 40 km south of Olary; Anabama Hill - Netley Hill - Round Hill |
| 1:250 000 SHEET: | OLARY |
| 1:100 000 SHEET: | Anabama 6932 |
| TARGETS: | Stratabound / syn-depositional Au (and base metals) |
| AGE/ROCK UNITS: | Neoproterozoic Adelaidean Umberatana Group |
| Note: | See EL 1102 for Locality Plan |

EXPLORATION SUMMARY:
EL 1234 was worked in conjunction with EL 1102 Copperlinka and EL 1163 Giles Nob. EL 1234 includes Wadnaminga Anticline and the northern limb of a major regional syncline, north of the Anabama-Redan Fault Zone.

Rock-chip sampling (2) at Golden Stream prospect indicated up to 6.2 ppm Au and 14 ppm Ag; 5 follow-up grab samples from old prospects and a rock-chip traverse (16 samples) in mid-1984 reported only weakly anomalous Cu, Pb, Zn, Ag, As. A high resolution aeromagnetic survey (990 sq km, 3980 line km) was flown in 1984 by Aerodata Pty Ltd over part EL 1234 and parts of adjacent ELs 1102, 1163.

In early 1985, RAB drilling (in conjunction with RAB drilling on EL 1163 Giles Nob) on 10 traverses targeted cross-cutting aeromagnetic anomalies - ie haematite-magnetite-goethite veins (traverses RT004 - 7), arenite siltstone in the core of the Wadnaminga Anticline (traverses RT002, 3, 8, 10, 11), and a crush breccia in the core of the anticline (traverse RT009). 1124 shallow (averaging 1.41m deep) holes were completed at 10m centres, for a total of 1124 samples and 1817.3m. Traverse RT008, near Welsh Prince Au Mine returned a number of anomalous Au values up to 0.10 ppm Au, and traverse RT002 returned 0.08 ppm Au from near the Saddleworth Formation - Craddock Quartzite interface. Ground magnetics along the traverses delineated the cross-cutting haematite-magnetite-goethite veins.

In conjunction with geological mapping, 14 rock-chip samples and 24 stream sediment samples were collected in the lower Sturtian tillites of the Benda Ranges; Au was generally low with a maximum of 0.08 ppm for the stream samples, and up to 0.38 ppm Au from chip samples in Wilyerpa Formation. Minor Zn, and less commonly Pb and Cu, were reported on 2 traverses (*Mann, S.T., July 1985. EL 1234, Round Hill - South Australia, Report for the Quarter Ended 15th July 1985. Utah Development Co, Report No CR 4688. In Envelope 5644*).

In August 1986 a short orientation radiometric survey was completed on EL 1234, EL 1102 Copperlinka and EL 1163 Giles Nob (*Wright, P., & Turner, R., October 1986. EL 1234, Round Hill - South Australia, Report for the Quarter Ended 15th October 1986. BHP Minerals, Report No CR5175. In Envelope 5644*).

MINERALISATION / PROSPECTS:
Golden Stream Au Mine/prospect
Welsh Prince Au Mine
part of Wadnaminga Goldfield

DRILLING:
early 1985: 1124 shallow RAB drillholes (average 1.41m depth, total 1817.3m) on 10 traverses (RT002 -11).

| | |
|---|---|
| TENEMENT: | EL 1249 Cottage Bore |
| COMPANY: | CRA EXPLORATION PTY LTD |
| Formerly: | |
| SML 706, | STOCKDALE P/L |
| Followed by: | |
| EL 1797 Bendigo, | FAIRVIEW GOLD P/L |
| AREA: | 860 sq km |
| COMMENCEMENT DATE: | 24.09.84 |
| EXPIRY DATE: | 25.06.86 |
| ENVELOPE: | 5944 Open File |
| DATA PLACED ON OPEN FILE: | July 1996 |
| REFERENCES: | - |
| LOCATION: | |
| 1:250 000 SHEET: | BURRA, ORROROO, CHOWILLA, OLARY |
| 1:100 000 SHEET: | Caroona 6731, Paratoo 6732, Murkaby 6831, Yunta 6832 |
| TARGETS: | diamonds |
| AGE/ROCK UNITS: | Mesozoic kimberlitic lamprophyres?, intruding Neoproterozoic Adelaidean metasediments |

EXPLORATION SUMMARY:
Follow-up gravel sampling over several unexplained indicator and microdiamond occurrences from exploration by Stockdale (SML 706) indicated a source near Macky's Dam for the picroilmenites (a kimberlite rich in picroilmenites, chromites, and minor pyrope garnet) but did not explain the microdiamond.

An aerial magnetics and radiometrics survey was flown over the eastern portion of EL 1249 in conjunction with EL 1311 Levi Range; 16 aeromagnetic and 13 photo-geological anomalies were ground-checked, together with ground magnetic traverses and heavy mineral sampling, revealing a suite of metasomatically altered basic to ultrabasic rocks and confirmed the presence of indicator minerals (chrome diopside, pyrope garnet, chromite, picro-ilmenite) at Double Dam and a microdiamond from Macky's Dam (*Howard, J.P., October 1985. Fourth Quarterly Report on Cottage Bore EL 1249, South Australia, for the Period Ending 24th September 1985. CRA Exploration Pty Ltd. In Envelope 5944*).

In 1985, 21 RC percussion holes (85CBRC1, 2A, 2B, 3, 5-18, 21, 22) totalling 392.5m were completed over 9 magnetic anomalies, 4 photo-geological anomalies, and a palaeochannel, intersecting 0.2 to 21m of ?Recent and Tertiary sediments over ?Adelaidean metasediments (siltstone, claystone, dolomite). No kimberlites were intersected, though one hole (85CBRC16) intersected dolerite; no microdiamonds were detected (*Howard, J.P., January 1986. Fifth Quarterly Report on Cottage Bore EL 1249, South Australia, for the Period Ending 24th December 1985. CRA Exploration Pty Ltd. In Envelope 5944*).

Follow-up ground magnetics (14 north-south traverses) at Macky's Dam did not indicate responses compatible with a significant kimberlite dyke or pipe; the magnetic signature is complicated by laterite (*Le Messurier, L.A., June 1986. Seventh Quarterly & Relinquishment Report on Cottage Bore EL 1249, South Australia, for Period Ending 23th June 1986. CRA Exploration Pty Ltd. In Envelope 5944*).

ANOMALIES / PROSPECTS:
Double Dam, Macky's Dam

| | |
|---|---|
| DRILLING: | late 1985: 21 RC percussion holes (85CBRC1, 2A, 2B, 3, 5-18, 21, 22) totalling 392.5m, over 14 anomalies. |

| | |
|---|---|
| TENEMENT: | EL 1250 Nackara |
| COMPANY:<br>taken over by | UTAH DEVELOPMENT COMPANY LTD<br>BHP MINERALS LTD |
| Formerly:<br>Followed by: | -<br>- |
| AREA: | 982 sq km, reducing to 167 sq km from 24.09.85 |
| COMMENCEMENT DATE: | 24.09.84 |
| EXPIRY DATE: | 12.09.86 |
| ENVELOPE: | Envelope 5869 Open File<br>Envelope 6411 Open File (partial relinquishment) |
| DATA PLACED ON OPEN FILE: | October 1986 |
| REFERENCES: | - |
| LOCATION: | west and southwest of Yunta |
| 1:250 000 SHEET: | OLARY, ORROROO |
| 1:100 000 SHEET: | Yunta 6832, Murkaby 6831 |
| TARGETS: | Telfer-style stratabound Au, placer Au, diamonds |
| AGE/ROCK UNITS: | Neoproterozoic Adelaidean, especially Tapley Hill Formation, Tarcowie Siltstone, Appila Tillite - Wilyerpa Formation, and Mesozoic kimberlitic lamprophyres? |

EXPLORATION SUMMARY:
EL 1250 lies between the Paratoo Anticline to the north, and Nackara Anticline to the south, both being doubly-plunging and northeast trending.

Exploration for Au included geological mapping in the Paratoo Anticline, and rock-chip (28) and stream sediment (94) sampling over the Paratoo Anticline and from dumps etc at known workings; 5 zones of slightly to moderately anomalous Au were indicated: follow-up of a zone with a speck of free gold in the original sample was disappointing.

Exploration for diamond-bearing kimberlites included regional heavy mineral stream sediment (29) and loam (8) sampling; 6 were also submitted for geochemical analysis; no kimberlitic indicator minerals were reported (*Wright, P., August 1986. Exploration Licence 1250 Nackara - South Australia, Final Report, August 1986. In Envelope 5869*)

MINERALISATION / PROSPECTS:
Robertson's Au Mine (brief description)
East Nob Mine, and West Nob Mine (brief description)
Whydown Au prospect/mine (brief description)
Nackara Au Reward (brief description)
Wheal Bassett Cu Mine (brief description, on ORROROO 1:250 000 map sheet)
Paratoo Cu Mine (brief description, on ORROROO 1:250 000 map sheet)

DRILLING: Nil

| | |
|---|---|
| TENEMENT: | EL 1268 Tiverton Homestead |
| COMPANY: | AUSTRALIAN ANGLO AMERICAN SEARCHES PTY LTD |
| Formerly: | - |
| Followed by: | |
| EL 1335 Tiverton, | AUSTRALIAN ANGLO AMERICAN SEARCHES P/L |
| AREA: | 1332 sq km |
| COMMENCEMENT DATE: | 11.01.85 |
| EXPIRY DATE: | 10.01.86 |
| ENVELOPE: | 6029 Open File |
| DATA PLACED ON OPEN FILE: | January 1986 |
| REFERENCES: | - |
| LOCATION: | 20 km south of Paratoo - Yunta - Mannahill |
| 1:250 000 SHEET: | OLARY, ORROROO |
| 1:100 000 SHEET: | Paratoo 6732, Yunta 6832, Anabama 6932 |
| TARGETS: | Stratabound Au, base metals |
| AGE/ROCK UNITS: | Neoproterozoic Adelaidean Umberatana Group, especially Tarcowie Siltstone Member |

EXPLORATION SUMMARY:
Exploration included processing of LANDSAT imagery which indicated a prominent northwest trending lineation superimposed on the dominant northeast stratigraphic lineation. Stream sediment samples (999) representing a sample density of one per 1.33 sq km, were analysed for As, Bi, Pb, and Se.

Follow-up included reconnaissance soil sample traverses over 2 areas indicated from the stream sediment sampling, and reconnaissance geological mapping, and rock-chip traverses over Tarcowie Siltstone including an area of auriferous quartz veining south of Gum Dam. The EL was relinquish following a change of strategic direction (*McBride, B., March 1986. Report to the Department of Mines and Energy for the Twelve Months Ending 10 January 1986, Final Report, EL 1268 - Benda Range. Australian Anglo American Searches Pty Ltd. In Envelope 6029*).

MINERALISATION / PROSPECTS: Nil

DRILLING: Nil

| | |
|---|---|
| TENEMENT: | EL 1279 Manunda |
| COMPANY: | CSR LTD |
| Formerly: | - |
| Followed by: | - |
| AREA: | 925 sq km |
| COMMENCEMENT DATE: | 20.03.85 |
| EXPIRY DATE: | 20.06.85 |
| ENVELOPE: | 6340 Open File |
| DATA PLACED ON OPEN FILE: | 1986 ? |
| REFERENCES: | - |
| LOCATION: | 30 km south of Yunta |
| 1:250 000 SHEET: | OLARY, ORROROO |
| 1:100 000 SHEET: | Paratoo 6732, Yunta 6832, Anabama 6932 |
| TARGETS: | stratiform / stratabound Au |
| AGE/ROCK UNITS: | Neoproterozoic Adelaidean Burra Group and Umberatana Group |

EXPLORATION SUMMARY:
Stream sediment BLEG samples (130) were analysed for Au, Cu, Ag, and stream sediment magnetic concentrates (90) were analysed for Cu, Pb, Zn, Ni, Co, and Fe. BLEG sampling indicated weakly anomalous Au in 3 samples from the same area, but re-sampling failed to replicate the results. Rock-chip sampling (19) across brecciated and silicified Burra Group near Bulyaninnie Homestead, Oak Park Homestead, and Spring Dam Homestead did not indicate significant anomalism; minor Au anomalism was associated with Mn and Fe staining (*Brunt, D.A., October 1985. Exploration Licence 1279 Manunda, South Australia, Final Report. CSR Ltd Minerals Exploration and Development Group, Report No EMR 109/85. In Envelope 6340*).

MINERALISATION / PROSPECTS: Nil

DRILLING: Nil

| | |
|---|---|
| TENEMENT: | EL 1285 Cronje Dam |
| COMPANY: | THE SHELL COMPANY OF AUSTRALIA LTD |

Formerly:

| | |
|---|---|
| SML 555 Brady's Dam, | and SML 556 Wadnaminga, |
| | MINES ADMINISTRATION P/L |
| | joint venture partners LONGREACH METALS NL |
| EL 16 Anabama, | SADM |
| EL 173 Anabama Hill | SADM |
| ELs 312, 508, 937 Cronje Dam, | CARPENTARIA EXPLORATION CO LTD |

Followed by:

| | |
|---|---|
| EL 1462 Lilydale, | CSR LTD, |
| | PLACER EXPLORATION LTD |
| EL 1830 Anabama, | PLACER EXPLORATION LTD |
| EL 1838 Lilydale, | DOMINION GOLD OPERATIONS P/L |
| EL 2136 Cronje Dam, | COPPERFIELD GOLD NL |

| | |
|---|---|
| AREA: | 753 sq km |
| COMMENCEMENT DATE: | 31.05.85 |
| EXPIRY DATE: | August 1985 (surrendered) |
| ENVELOPE: | 6192 Open File |
| DATA PLACED ON OPEN FILE: | September 1985 |

REFERENCES:

Gerdes, R.A, 1973. Anabama Fault Project. Regional Geophysical Interpretation of the Southern Half of the OLARY and Northern Half of CHOWILLA 1:250 000 Sheet Areas. *South Australia Department of Mines and Energy. Report Book* 73/75.

Gerdes, R.A., 1975. Induced Polarisation and Magnetic Surveys of the Anabama Copper Mine and the Cronje Dam Prospect (EL 16), OLARY 1:250 000 Sheet. *South Australia Department of Mines and Energy. Report Book* 75/60.

| | |
|---|---|
| LOCATION: | Lilydale - Cronje Dam, 50 km south of Mannahill |
| 1:250 000 SHEET: | OLARY |
| 1:100 000 SHEET: | Yunta 6832, Anabama 6932 |
| TARGETS: | Au-Cu |
| AGE/ROCK UNITS: | Neoproterozoic Boucaut Volcanics |

EXPLORATION SUMMARY:

EL 1285 covers the northern margin of the 30 km wide Anabama - Redan Fault Zone. The acid to intermediate Boucaut Volcanics and intercalated sedimentary rock units strike east-northeast and dip steeply; metamorphism ranges from greenschist to lower amphibolite facies. Intercalated schists are pyritic (syngenetic?), and cross-cutting quartz veins carry pyrite, chalcopyrite and malachite

Exploration included re-analysis of selected intervals from prior RAB and percussion drilling undertaken by Carpentaria Exploration Co Ltd, but no significant Au was indicated. Field checking and rock-chip sampling at Anabama Copper Mine, Cronje Copper Prospect, and Division Dam returned a best result of 2.1% Cu and 0.9 ppm Au over a 0.8m wide quartz vein at Anabama Mine; the area was considered sub-economic for Au mineralisation, and the EL was surrendered (*Dashlooty, S.A., August 1985. First Quarterly and Relinquishment Report of Cronje Dam EL 1285, Olary Region, SA. Billiton Australia / The Metals Division of the Shell Co of Australia Ltd. In Envelope 6192*).

MINERALISATION / PROSPECTS:
White Rock
Two Brothers
Anabama Copper Mine (brief description in Envelope 6192)
Anomaly F
Cronje Copper Prospect
Division Dam.

| | |
|---|---|
| TENEMENT: | EL 1311 Levi Range |
| COMPANY: | CRA EXPLORATION PTY LTD |
| Formerly: | - |
| Followed by: | - |
| AREA: | 437 sq km |
| COMMENCEMENT DATE: | 02.12.85 |
| EXPIRY DATE: | 25.06.86 |
| ENVELOPE: | 6504 Open File |
| DATA PLACED ON OPEN FILE: | July 1986 |
| REFERENCES: | - |
| LOCATION: | 30 km southeast of Paratoo |
| 1:250 000 SHEET: | CHOWILLA, OLARY |
| 1:100 000 SHEET: | Murkaby 6831, Yunta 6832 |
| TARGETS: | diamonds |
| AGE/ROCK UNITS: | Mesozoic kimberlitic lamprophyres in Neoproterozoic Adelaidean metasediments |

EXPLORATION SUMMARY:
An aerial magnetics and radiometrics survey was flown over EL 1311 in conjunction with EL 1249 Cottage Bore; 5 anomalies were recovered with follow-up ground magnetics. In early 1986, 4 RC percussion drillholes totalling 165m intersected ?Adelaidean metasediments in 2 prospects (drillholes 85CBRC19, 20), with lamprophyric dykes, basalt, brecciated sediment and metasomatic alteration were intersected at 2 other prospects (drillholes 85CBRC23, 24) (*Howard, J.P., February 1986. First Quarterly Report on Levi Range EL 1311, South Australia, for the Period Ending 2nd March 1986. CRA Exploration Pty Ltd. In Envelope 6504*).

Indicator minerals and a single microdiamond were recovered in a gravel sample near one of these prospects, but the indicator minerals in the gravel implied that the adjacent porphyritic lamprophyre was not the source of the diamond; it was inferred that the diamond and indicator minerals were derived from widespread surficial sediments etc (*Le Messurier, L.A., and Jenke, G.P., June 1986. Second Quarterly and Final Relinquishment Report on Levi Range EL 1311, South Australia, for the Period Ending 2nd June 1986. CRA Exploration Pty Ltd. In Envelope 6504*).

MINERALISATION / PROSPECTS: Nil

DRILLING:
early 1986: 4 RC percussion drillholes (85CBRC19, 20, 23, 24) totalling 165m.

| | |
|---|---|
| TENEMENT: | EL 1321 Iron Peak |
| COMPANY: | NEWMONT HOLDINGS PTY LTD |
| Formerly: | - |
| Followed by: | - |
| AREA: | 734 sq km |
| COMMENCEMENT DATE: | 12.03.86 |
| EXPIRY DATE: | 11.03.87 |
| ENVELOPE: | 6556 Open File |
| DATA PLACED ON OPEN FILE: | March 1987 |
| REFERENCES: | - |
| LOCATION: | near Lilydale - Old Manunda, 45 km southeast of Yunta |
| 1:250 000 SHEET: | OLARY |
| 1:100 000 SHEET: | Yunta 6832, Anabama 6932 |
| TARGETS: | Telfer-style? stratabound Au and base metals |
| AGE/ROCK UNITS: | Neoproterozoic Adelaidean metasediments, especially Pualco Tillite, Benda Siltstone, Braemar Iron Formation |

EXPLORATION SUMMARY:
The Iron Peak tenement was in Adelaidean metasedimenst and volcanics to the north of the Anabama - Redan Fault Zone, adjacent to the southwest of the Anabama Granite. The exploration model postulated syngenetic fine-grained stratabound Au, deposited in basins during or soon after periods of basin subsidence and instability. Initial exploration comprised 194 BLEG soil? samples, tested for Au, Cu, Ag, for a sample density of one per 3.78 sq km; planned sample density was one per 2 sq km or better.

Rock-chip sampling concentrated on siliceous zones and units in Braemar Iron Formation, but best values were less than 0.1 ppm Au. A chip-channel sample across the 'lode-horizon' at Eldorado Mine returned negligible base and precious metals (*Jones, D.G., March 1987. Iron Peak EL 1321, OLARY 1:250 000 Sheet, South Australia, Final Report and Fourth Quarterly Report to 12 March 1987. Newmont Australia Ltd. In Envelope 6556*).

MINERALISATION / PROSPECTS:
Eldorado Au Mine

DRILLING: Nil

| | |
|---|---|
| TENEMENT: | EL 1322 Teetulpa Goldfield |
| COMPANY: | WESTERN MINING CORPORATION LTD (WMC) |
| Formerly: | |
| EL 530 Yardlowie - Mannahill, | CRA EXPLORATION P/L |
| EL 942 Mount Misery, | UTAH DEVELOPMENT CO |
| EL 1098 Teetulpa Goldfield, | JARMAND MINERALS & EXPLORATION P/L |
| EL 1161 Mannahill, | JARMAND MINERALS & EXPLORATION P/L |
| EL 1164 Mannahill, | AMAX AUSTRALIA (GOLD) P/L |
| EL 1226 Teetulpa Goldfield, | JARMAND MINERALS & EXPLORATION P/L, and CSR LTD |
| Followed by: | |
| EL 1376 Hope Bank, | CRA EXPLORATION P/L |
| EL 1413 Teetulpa Goldfield, | THOMDRILL P/L |
| EL 1436 Mannahill, | HALLMARK GOLD NL |
| EL 1490 Teetulpa Goldfield, | COVE MINING NL |
| EL 1961 Yunta - Mannahill, | EQUINOX RESOURCES NL |
| EL 2126 Teetulpa Goldfield, | MINTECH RESOURCES P/L |
| AREA: | 726 sq km |
| COMMENCEMENT DATE: | 24.03.86 |
| EXPIRY DATE: | 23.03.87 |
| ENVELOPE: | 6711c Open File |
| DATA PLACED ON OPEN FILE: | April 1987 |
| REFERENCES: | - |
| LOCATION: | Mannahill - Teetulpa Goldfields - Mount Victor area |
| 1:250 000 SHEET: | OLARY |
| 1:100 000 SHEET: | Winnininnie 6833 |
| TARGETS: | Bed-rock and alluvial Au |
| AGE/ROCK UNITS: | Neoproterozoic Adelaidean metasediments |

EXPLORATION SUMMARY:
WMC was granted permission for joint reporting on adjoining tenements EL 1322 Teetulpa, EL 1334 Wattle Dam, and EL 1346, Mannahill. Most work was undertaken on EL 1322 Teetulpa.

Targets in the Teetulpa area included:
- bed-rock Au below or associated with the Teetulpa alluvial workings
- Telfer-style stratabound Au
- gold-bearing quartz veins in shatter zones or stockworks
- untested repetitions of the Teetulpa lodes.

Exploration on EL 1322 Teetulpa included:
- 144 rock-chip samples of the lode and mine dumps
- 26 samples of tailings
- 31 stream sediment samples
- 349 orientation soil samples
- 1079 soil samples on a grid (5230m north-south and maximum east-west extent of 4380m) with 14 east-west lines at nominal 400m spacing.

Gradient array and dipole-dipole IP, resistivity, and SIROTEM were used to generate drilling targets at Teetulpa. In August 1986, 16 angled RC percussion holes (TTLP1-16) totalling 979m were completed; drilling intersected black slates with minor fine-grained micaceous schist, with fine grained pyrite coating in fractures, and with minor graphite (*Paterson, H.L., October 1986. Second Quarterly Report for EL 1322 Teetulpa, EL 1334 Wattle Dam, EL 1346, Mannahill, June 24 1986 to September 23 1986. Western Mining Corporation Ltd Exploration Division. In*

*Envelope 6711*). Gold values were low, the only exception being drillhole TTLP16 which recorded 1 metre (from 10-11m) at 2.27 ppm Au under the Blue Star - Jubilee line of workings; the feature outlined by geophysics were thus interpreted as zones of deeper weathering, possibly post-mineralisation faults. 5 ground magnetometer traverses totalling 37.5 km were completed across a west-northwest aeromagnetic lineament in EL 1322, but with no interpretation (*Paterson, H.L., January 1987. Third Quarterly Report for EL 1322 Teetulpa, EL 1334 Wattle Dam, EL 1346, Mannahill, September 24 1986 to December 23 1987. Western Mining Corporation Ltd Exploration Division. In Envelope 6711*).

MINERALISATION / PROSPECTS:
Teetulpa Au Goldfield, alluvial and bed-rock
including: Blue Star - Jubilee line of workings

DRILLING:
August 1986: 16 angled RC percussion holes (TTLP1-16) totalling 979m

| | |
|---|---|
| TENEMENT: | EL 1334 Wattle Dam |
| COMPANY: | WESTERN MINING CORPORATION LTD (WMC) |
| Formerly: | |
| EL 530 Yardlowie - Mannahill, | CRA EXPLORATION P/L |
| EL 942 Mount Misery, | UTAH DEVELOPMENT CO |
| EL 1161 Mannahill Goldfield, | JARMAND MINERALS & EXPLORATION P/L |
| EL 1164 Mannahill, | AMAX AUSTRALIA (GOLD) P/L |
| Followed by: | |
| EL 1376 Hope Bank, | CRA EXPLORATION P/L |
| EL 1436 Mannahill, | HALLMARK GOLD NL |
| EL 1961 Yunta - Mannahill, | EQUINOX RESOURCES NL |
| AREA: | 159 sq km |
| COMMENCEMENT DATE: | 12.05.86 |
| EXPIRY DATE: | 30.03.87 (surrendered) |
| ENVELOPE: | 6711c Open File |
| DATA PLACED ON OPEN FILE: | April 1987 |
| REFERENCES: | - |
| LOCATION: | Mannahill - Teetulpa Goldfields - Mount Victor area |
| 1:250 000 SHEET: | OLARY |
| 1:100 000 SHEET: | Winnininnie 6833 |
| TARGETS: | bed-rock and alluvial Au |
| AGE/ROCK UNITS: | Neoproterozoic Adelaidean metasediments |

See EL 1322 Teetulpa for Locality Plan

EXPLORATION SUMMARY:
WMC was granted permission for joint reporting on adjoining tenements EL 1322 Teetulpa, EL 1334 Wattle Dam, and EL 1346, Mannahill. Most work was undertaken on EL 1322 Teetulpa.

Exploration on EL 1334 Wattle Dam included:
23 rock-chip and dump samples from Royal Charlie Mine
43 soil samples on 3 north-northwest traverses at Royal Charlie Mine
(*Paterson, H.L., August 1986. First Quarterly Report for EL 1322 Teetulpa, EL 1334 Wattle Dam, EL 1346, Mannahill, March 24 1986 to June 23 1986. Western Mining Corporation Ltd Exploration Division. In Envelope 6711*).

MINERALISATION / PROSPECTS:
Royal Charlie Au Mine

DRILLING: Nil

| | |
|---|---|
| TENEMENT: | EL 1335 Tiverton |
| COMPANY: | AUSTRALIAN ANGLO AMERICAN SEARCHES PTY LTD |
| Formerly: EL 1268 Tiverton HS, | AUSTRALIAN ANGLO AMERICAN SEARCHES P/L |
| Followed by: | - |
| AREA: | 1332 sq km |
| COMMENCEMENT DATE: | 28.05.86 |
| EXPIRY DATE: | 30.06.86 (surrendered) |
| ENVELOPE: | No Envelope |
| DATA PLACED ON OPEN FILE: | No data supplied |
| REFERENCES: | - |
| LOCATION: | 20 km south of Paratoo - Yunta - Mannahill |
| 1:250 000 SHEET: | OLARY |
| 1:100 000 SHEET: | Paratoo 6732, Yunta 6832, Anabama 6932 |
| TARGETS: | - |
| AGE/ROCK UNITS: | - |
| EXPLORATION SUMMARY: | No work undertaken |
| MINERALISATION / PROSPECTS: | Nil |
| DRILLING: | Nil |

| | |
|---|---|
| TENEMENT: | EL 1346, Mannahill |
| COMPANY: | WESTERN MINING CORPORATION LTD (WMC) |

Formerly:

| | |
|---|---|
| SML 635 Mannahill, | ELVIRE P/L |
| EL 363 Mannahill Goldfield, | NEWMONT P/L |
| EL 530 Yardlowie - Mannahill, | CRA EXPLORATION P/L |
| EL 942 Mount Misery, | UTAH DEVELOPMENT CO |
| EL 1161 Mannahill Goldfield, | JARMAND MINERALS & EXPLORATION P/L |
| EL 1164 Mannahill, | AMAX AUSTRALIA (GOLD) P/L |

Followed by:

| | |
|---|---|
| EL 1376 Hope Bank, | CRA EXPLORATION P/L |
| EL 1436 Mannahill, | HALLMARK GOLD NL |
| EL 1961 Yunta - Mannahill, | EQUINOX RESOURCES NL |
| EL 2191 Mannahill, | NORSCOM P/L |

| | |
|---|---|
| AREA: | 267 sq km |
| COMMENCEMENT DATE: | 29.07.86 |
| EXPIRY DATE: | 30.03.87 (surrendered) |
| ENVELOPE: | 6711 Open File |
| DATA PLACED ON OPEN FILE: | April 1987 |
| REFERENCES: | - |
| LOCATION: | Mannahill - Teetulpa Goldfields - Mount Victor area |
| 1:250 000 SHEET: | OLARY |
| 1:100 000 SHEET: | Winnininnie 6833, Olary 6933 |
| TARGETS: | bed-rock and alluvial Au |
| AGE/ROCK UNITS: | Neoproterozoic Adelaidean metasediments |

See EL 1322 Teetulpa for Locality Plan

EXPLORATION SUMMARY:
WMC was granted permission for joint reporting on adjoining tenements EL 1322 Teetulpa, EL 1334 Wattle Dam, and EL 1346, Mannahill. Most work was undertaken on EL 1322 Teetulpa.

In the Mannahill area, repetitions of the known flat-dipping lode systems were sought. Exploration on EL 1346 Mannahill included:

- 43 rock-chip and dump samples from Aurora Australis, Birthday, Elsie May, Eudunda, Euro, Florina, Homeward Bound, Morialpa, Westward Ho!, Nectar, No Gammon, Odd Trick, Trojan
- 4 tailings samples from the Homeward Bound Mine
- 28 stream sediment samples near Morialpa and Westward Ho!

Results were not encouraging (*Paterson, H.L., August 1986. First Quarterly Report for EL 1322 Teetulpa, EL 1334 Wattle Dam, EL 1346, Mannahill, March 24 1986 to June 23 1986. Western Mining Corporation Ltd Exploration Division. In Envelope 6711*).

MINERALISATION / PROSPECTS:

| | |
|---|---|
| Mannahill Goldfield: | Aurora Australis |
| | Birthday |
| | Elsie May |
| | Eudunda |
| | Euro |
| | Florina |
| | Homeward Bound |
| | Morialpa |

Westward Ho!
Nectar
No Gammon
Odd Trick
Trojan

DRILLING: Nil

| | |
|---|---|
| TENEMENT: | EL 1376 Hope Bank |
| COMPANY: | CRA EXPLORATION PTY LTD |
| Formerly: | |
| SML 479 Mannahill, | ELVIRE P/L |
| SML 635 Mannahill, | ELVIRE P/L |
| EL 363, Mannahill Goldfield, | NEWMONT P/L |
| EL 584 Mount Victor, | CRA EXPLORATION P/L |
| EL 942 Mount Misery, | UTAH DEVELOPMENT CO |
| taken over in April 1984 by | THE B.H.P. CO. LTD |
| EL 1161 Mannahill Goldfield, | JARMAND MINERALS & EXPLORATION P/L |
| EL 1164 Mannahill, | AMAX AUSTRALIA (GOLD) P/L |
| EL 1322 Teetulpa, | WESTERN MINING CORPORATION LTD |
| EL 1334 Wattle Dam, | WESTERN MINING CORPORATION LTD |
| EL 1346 Mannahill, | WESTERN MINING CORPORATION LTD |
| Followed by: | |
| EL 1436 Mannahill, | HALLMARK GOLD NL |
| EL 1961 Yunta - Manna Hill, | EQUINOX RESOURCES NL |
| AREA: | 1303 sq km |
| COMMENCEMENT DATE: | 06.01.87 |
| EXPIRY DATE: | 06.09.88 (surrendered) |
| ENVELOPE: | 6819 Open File |
| DATA PLACED ON OPEN FILE: | September 1988 |
| REFERENCES: | - |
| LOCATION: | 20 km northwest of Yunta |
| 1:250 000 SHEET: | ORROROO, OLARY |
| 1:100 000 SHEET: | Winnininnie 6833, Koonamore 6733, Paratoo 6732 |
| TARGETS: | stratabound Au and base metals |
| AGE/ROCK UNITS: | Neoproterozoic Adelaidean Elatina Subgroup and Tarcowie Siltstone |

EXPLORATION SUMMARY:
EL 1376 covers the eastern and western closures of the Waukaringa Syncline and anticline to the south. Processing and interpretation of digital aeromagnetic data was followed by geological mapping which indicated that areas of low relief Tarcowie Siltstone had not been adequately sampled by previous tenement holders. Exploration included collection of 452 overbank silt samples from catchments across the EL (ie targeting very fine-grained Au), 93 soil samples from an area east of Waukaringa Mine (on ORROROO 1:250 000 map sheet) and from drainage divides across the EL, and 6 rock-chip samples. Sampling indicated some low-order Au, Cu, Pb, and Zn anomalies, in particular anomalous gold in catchments draining the upper glacial sequence (Elatina Subgroup), and minor As/Sb anomalism associated with cross-cutting north-northeast joint sets (*Murrell, B., and Sugden, S.P., October 1987. Third Quarterly Report for Hope Bank EL 1376, South Australia, for the Period Ending 5th October, 1987. CRA Exploration Pty Ltd. In Envelope 6819*).

Catchments draining Farina Sub-Group south of Waddington Bluff returned weak Zn/Au anomalism, with weak Cu/Pb/Zn anomalism in catchments draining the anticlinal closure of Appila Tillite east of Hantken Hill. However, these anomalous areas were downgraded by 51 follow-up rock-chip samples which all returned low base-metal values, with the exception of lateritic ironstone which returned 470 ppm Zn, 1100 ppm Pb, and 160 ppm Cu (*Palmer, D.C., August 1988. Sixth Quarterly and Final Report for Hope Bank EL 1376, South Australia, for the Period Ending 5th July, 1988. CRA Exploration Pty Ltd. In Envelope 6819*).

MINERALISATION / PROSPECTS:
Waukaringa Mine (adjacent to EL 1376, on ORROROO 1:250 000 map sheet)
Ajax Mine (adjacent to EL 1376, on ORROROO 1:250 000 map sheet)
DRILLING: Nil

| | |
|---|---|
| TENEMENT: | EL 1395 Nillinghoo |
| COMPANY: | WAVRIN HOLDINGS PTY LTD |
| Formerly: | |
| EL 530 Yardlowie - Mannahill, | CRA EXPLORATION P/L |
| EL 584 Mount Victor, | CRA EXPLORATION P/L |
| Followed by: | - |
| AREA: | 218 sq km?, 145 sq km |
| COMMENCEMENT DATE: | 25.03.87 |
| EXPIRY DATE: | 24.09.87 |
| ENVELOPE: | Envelope 6876 Open File, Envelope 6531 (Confidential) |
| DATA PLACED ON OPEN FILE: | October 1987 |
| REFERENCES: | - |
| LOCATION: | Mount Victor - Nillinghoo Goldfield, 55 km north of Yunta |
| 1:250 000 SHEET: | OLARY, ORROROO |
| 1:100 000 SHEET: | Koonamore 6733, Winnininnie 6833 |
| TARGETS: | Au |
| AGE/ROCK UNITS: | Neoproterozoic Adelaidean Burra Group and Yudnamutana Subgroup |

EXPLORATION SUMMARY:
Exploration included regional geological mapping, and field evaluation of east-west faults through the regional anticlinal core, though assay results from 32 rock samples from quartz veins and ironstones across the anticline indicated Au generally below detection limits, with best value of 0.61 g/t Au near One Tree Hill (which has been previously drilled); base metal values were also low (*Carthew, S., August 1987. Quarterly Report for the Period March to June 1987, Exploration Licence 1395 Nillinghoo. Nobelex Ltd. In Envelope 6876*).

Interpretation of LANDSAT data failed to reveal major crustal features through the area, and recent drilling by Nobelex at Kirkeek's Treasure indicated that Au is in quartz vein stockworks in fractured quartzites, along a major fault in the core of a regional anticline, and that mineralisation is essentially supergene enrichment (*Carthew, S., November 1987. Gold Exploration on EL 1395 Nillinghoo, July 1987 to October 1987. Nobelex Ltd. In Envelope 6876*).

MINERALISATION / PROSPECTS:
Nillinghoo Goldfield: Kirkeek's Treasure Au Mine (within, but not part of, EL 1395)
Orama Hill Au Mine

DRILLING: Nil

| | |
|---|---|
| TENEMENT: | EL 1396 Benda Range |
| COMPANY: | THE SHELL COMPANY OF AUSTRALIA LTD |
| Joint Venture with | TRI-ARC ENERGY LTD |
| Formerly: | - |
| Followed by: | - |
| AREA: | 1455 sq km |
| COMMENCEMENT DATE: | 19.04.87 |
| EXPIRY DATE: | 28.04.88 |
| ENVELOPE: | 6895 Open File |
| DATA PLACED ON OPEN FILE: | September 1988 |
| REFERENCES: | - |
| LOCATION: | east of Paratoo - Yunta |
| 1:250 000 SHEET: | OLARY, ORROROO |
| 1:100 000 SHEET: | Paratoo 6732, Yunta 6832, Anabama 6932 |
| TARGETS: | Au in discordant quartz veining |
| AGE/ROCK UNITS: | Neoproterozoic Adelaidean Umberatana Group, especially Tarcowie Siltstone, and Burra Group especially Saddleworth Formation |

EXPLORATION SUMMARY:
Exploration included rock-chip sampling (9) of previously known anomalous Au areas, and stream sediment BLEG sampling (16); it was concluded that As, Cu, Ag were unreliable pathfinders for Au (*Prowse, G.K., November 1987. Report for the Quarter Ending 28th November 1987, Exploration Licence 1396, Benda Range, South Australia. The Shell Co of Australia Ltd, Tri-Arc Energy Ltd. In Envelope 6895*)

MINERALISATION / PROSPECTS:
Gum Well Mine (Au)
Scobie Hill Mine (Au)

DRILLING: Nil

TENEMENT: EL 1413 Teetulpa Goldfield

COMPANY: THOMDRILL PTY LTD

Formerly:
EL 1098 Teetulpa Goldfield, JARMAND MINERALS & EXPLORATION P/L
EL 1226 Teetulpa Goldfield, JARMAND MINERALS & EXPLORATION P/L
EL 1322 Teetulpa Goldfield, WESTERN MINING CORPORATION LTD

Followed by:
EL 1490 Teetulpa Goldfield, COVE MINING NL
EL 2126 Teetulpa Goldfield, MINTECH RESOURCES P/L

AREA: 725 sq km
COMMENCEMENT DATE: 17.07.87
EXPIRY DATE: 16.01.88 (surrendered)
ENVELOPE: 6935 Open File
DATA PLACED ON OPEN FILE: 1988 ?
REFERENCES:
Brown, H.Y.L., 1908. Record of Mines of South Australia.

Hough, L.P., 1988. Seismic refraction survey, Teetulpa Goldfields. *South Australia Department of Mines and Energy. Report Book* 88/15.

LOCATION: Teetulpa Goldfield, 35 km northeast of Yunta
1:250 000 SHEET: OLARY
1:100 000 SHEET: Winnininnie 6833
TARGETS: Au, especially placer deposits
AGE/ROCK UNITS: Pliocene?

EXPLORATION SUMMARY:
Based on a comment by H.Y.L. Brown in 1908 (p316) that auriferous Pliocene leads may underlie the alluvial flats of Salt Creek, north of Brady's Gully at Teetulpa Goldfield, an exploration model was developed of auriferous gravel beneath calcrete capping downstream from Brady's Gully and Strawbridge's Gully.

Exploration included 2 east-west shallow-refraction seismic profiles (by SADME) across Salt Creek, followed in August 1987 by 27 RAB and RC drillholes, totalling 272.9m, on 3 traverse lines, one along each of the seismic lines and a third across Brady's Gully where it enters Salt Creek:
Seismic line 1: Holes 1-6, intersected alluvial gravel in holes 4 and 5 over greenish shale; otherwise immature alluvium / eluvium
Seismic line 2: Holes 7-16 and 7.5, intersected alluvial gravel (except in Hole 16) over weathered to fresh shale
Line 3: Holes 17-26, intersected relatively immature gravels in all holes except at the end of the line (No's 24, 26), over weathered greenish shale.

BLEG Au assays on composite samples were disappointing, all being 0.1 to 0.5 ppb Au, with the exception of 8.0 ppb from Hole 4 (*Tonkin, D.G., December 1987. First Quarterly Report on Exploration Licence 1413, Teetulpa Goldfield, South Australia, 17 July to 16 October 1987. Thomdrill Pty Ltd. In Envelope 6935*).

The title was relinquished following an assessment by Gold and Mineral Exploration NL (potential Joint Venture partners) downgrading the hard rock gold potential in the tenement.

MINERALISATION / PROSPECTS:
Teetulpa Goldfield: Brady's Gully, and Strawbridge's Gully

DRILLING:August 1987: 27 RAB and RC drillholes, totalling 272.9m, on 3 traverse lines.

| | |
|---|---|
| TENEMENT: | EL 1416 Bendigo Station |
| COMPANY: | FAIRVIEW GOLD PTY LTD, |
| Joint venture from 1988 with | AZTEC MINING COMPANY LIMITED. |
| Bought on 13.11.91 by | CRACOW RESOURCES LTD |
| Formerly: | |
| SML 706, | STOCKDALE |
| EL 517, | DAMPIER |
| EL 1249 Cottage Bore, | CRA EXPLORATION P/L |
| Followed by: | |
| EL 1797 Bendigo, | FAIRVIEW GOLD P/L |
| AREA: | 2553 sq km, reducing to 1331 sq km on 01.08.91 |
| COMMENCEMENT DATE: | 06.08.87 |
| EXPIRY DATE: | 05.08.92 |
| ENVELOPE: | Envelope 6931 Open File<br>Envelope 8585 Open File (partial relinquishment) |
| DATA PLACED ON OPEN FILE: | February 1996 |
| REFERENCES: | M.I.Q. 66, June 1992, p 13 |
| LOCATION: | Bendigo area |
| 1:250 000 SHEET: | CHOWILLA, OLARY, ORROROO & BURRA |
| 1:100 000 SHEET: | Murkaby 6831, Yunta 6832, Paratoo 6732, Caroona 6731 |
| TARGETS: | Stratiform / stratabound Au and base metals |
| AGE/ROCK UNITS: | Neoproterozoic Adelaidean of the Nackara Arc, Burra Group and Umberatana Group |

EXPLORATION SUMMARY:
Exploration commenced with reconnaissance geological mapping and sampling (totalling 192 rock-chip samples, 37 stream sediment samples, and 261 soil samples), delineating 3 gold-bearing anomalies, comprising cupriferous ferruginous quartz gangue in well-defined linear structures, and as less-well defined pervasive mineralisation; all are in local anticlinal structures, near the contact between quartz-rich sandstone and pyritic siltstone in Umberatana Group, and involve both hypergene and supergene processes:
Levi Range anticline, with from 1.60 to 6.45 g/t Au over 18 sq km.
Wheal Bassett anticline (on ORROROO 1:250 000 map sheet), in an area of old copper mines/prospects, with up to 0.18 g/t Au.
Hill Grange anticline (on ORROROO 1:250 000 map sheet), on the northwestern faulted margin of Bulyaninnie Diapir, in an area of old supergene Cu / Au mining/prospecting, with from 0.08 to 18.4 g/t Au over a 1.5 by 1 km area. Ongoing sampling at Hill Grange prospect, formerly known as Agross Copper Mines, confirmed Cu-Au (from 0.5 to 18.0 g/t Au) in quartz-siderite (iron oxide), and indicated the significance of the Bulyaninnie Fault in ore emplacement. Host rocks are inferred Farina Subgroup quartz-rich sandstone, siltstone, and thin dolomite. Follow-up sampling (at a spacing of 25m on east-west lines 50m apart), confirmed anomalous Au over an area of 1300m by 150 - 200m, and within this highlighted the 'northern prospect' and 'southern prospect', 600m apart; and Au is related to extensive fine multi-directional quartz, quartz-siderite, quartz-pyrite-chalcopyrite veining.

A small Cu - Au prospect (Tuilkilkie anomaly, on BURRA 1:250 000 map sheet) was identified adjacent to a kimberlitic intrusive, and Fairview suggested a relationship between this and migration of silica- and sulphide-bearing ore solutions. Fairview also tentatively identified 2 siliceous palaeo-hotsprings on a major northeast-trending fault cutting Appila Tillite and Pepuarta Tillite. Reconnaissance chip sampling and stream sediment sampling was completed at Nackara Reward and Wheal Motley Gold Mines.

Geological mapping and sampling at Mafeking Zn anomaly, in a basinal or synformal setting on the southeastern flank of Bulyaninnie Anticline (on ORROROO 1:250 000 map sheet), indicated stratabound Zn was associated with pyritic limestone in quartzo-feldspathic sandstone (inferred lower Tarcowie Siltstone, possibly Ulupa

Formation), with from 0.1 to 1.5% Zn (as sphalerite with minor galena), with a strike length of 3 km and width of 40m; best result was 2.6% Zn was recorded in ferruginous gossan. Resistivity and gradient array IP traverses by Zonge Engineering revealed a low resistance zone including 3 strong IP anomalies.

In July-August 1990, 26 reverse circulation drillholes were completed totalling 2352m.
At Hill Grange, 12 holes (HGP01 to 12, totalling 1080m, angled $60^0$) revealed best Au was from 10-30m below surface, resulting from supergene enrichment, and best result was 0.630 g/t Au in HGP006 from 15-20m.
At Mafeking, 14 holes (MZP01 to 14, totalling 1272m, 7 vertical and 7 angled $60^0$) intersected anomalous Zn in all holes, but did not intersect economic Zn mineralisation; drilling did confirm Zn - Pb - Ag in black pyritic shale and calcareous sediments, and indicated increasing Zn grade with depth; best results were 245 ppm Pb and 0.62% Zn (*Greene, F.F., 1987 to 1991. Exploration Licence 1416, Bendigo Station Area, Adelaide Geosyncline, South Australia, Quarterly Reports 1 to 16 for the Periods Ending 6 November 1987 to 6 August 1991. Fairview Gold Pty Ltd. In Envelope 6931*).

Following acquisition of Fairview Gold by Cracow Resources in late 1991, Cracow undertook follow-up IP survey by Zonge Engineering, and detailed structural mapping which extended the prospective stratigraphic horizon to 5 km strike length (*Blayden, I.D., February 1992. Exploration Licence 1416, Combined 17th and 18th Quarterly Reports for the Periods ending November 5 1991 and February 5 1992. Cracow Resources Ltd. In Envelope 8585,* including, *Conor, C.H.H., February 1992. Mafeking Zinc Prospect, Structural Geological Mapping, for Fairview Gold Pty Ltd*)

In March-April 1992, 5 RC (MZP16 to 20) and 2 RC-diamond holes (MZP21 & 22), totalling 862m of RC and 1457.7m of diamond drilling, were completed at Mafeking. MZP19 intersected kaolinitic dolomitic siltstone at a resistivity low, away from the main prospect area. Remaining holes intersected pyritic laminated sandstone and sandy siltstone beneath pyritic carbonaceous siltstone; the 'Zinc-rich series' was defined to include Zn-bearing carbonates within these. Higher Zn is usually associated with the sandstone, with from 0.3 % to 0.5% Zn over 40 to 60m intervals as disseminations or veinlets of sphalerite, with minor galena (*Conor, C.H.H., June 1992. Mafeking Zinc Prospect, Drill Completion Report, for Fairview Gold Pty Ltd. In Envelope 8585,* and, *Blayden, I.D., March 1992. EL 1416, Bendigo Station area - South Australia. First Relinquishment Report. Cracow Resources Ltd. In Envelope 8585*).

MINERALISATION / PROSPECTS:
Hill Grange Au prospect , formerly known as Agross Copper Mines (on ORROROO 1:250 000 map sheet): shallow diggings strung out over 1 km by 400m
Mafeking Zn prospect (on ORROROO 1:250 000 map sheet)
Wheal Bassett Cu? Mine: 4 shafts in secondary copper oxide in beached calcareous Tindelpina Shale, on the western limb of the Nackara Anticline, 400m from the Burra Group - Umberatana Group unconformity (on ORROROO 1:250 000 map sheet)
'The Oaks' anomaly: a northeasterly trending fault-related alteration zone peripheral to the Bendigo Granite (on BURRA 1:250 000 map sheet)
Tuilkilkie anomaly (on BURRA 1:250 000 map sheet)
Nackara Reward Au Mine (on ORROROO 1:250 000 map sheet)
Wheal Motley Cu-Au Mine: quartz veining and secondary copper oxides in vertical shaft to 7m in quartz-rich sandstone of Pualco Tillite
Terowie Au prospect: ferruginous quartz veinlets, near the Burra Group - Umberatana Group unconformity, on the western limb of the Pualco Anticline (on ORROROO 1:250 000 map sheet)
Cone Alluvial Diggings: alluvial workings over 12 hectare, 12 km east of Mount Grainger Goldfield (on ORROROO 1:250 000 map sheet)

DRILLING:
July-August 1990, 26 reverse circulation drillholes totalling 2352m:
Hill Grange, HGP01 to 12, totalling 1080m, angled $60^0$.
Mafeking, MZP01 to 14, totalling 1272m 7 vertical and 7 angled $60^0$.

March-April 1992, at Mafeking:

5 RC (MZP16 to 20) holes
2 RC-diamond holes (MZP21 & 22),
totalling 862m of RC and 1457.7m of diamond drilling.

| | |
|---|---|
| TENEMENT: | EL 1436 Mannahill |
| COMPANY: | HALLMARK GOLD NL |
| Formerly: | |
| SML 479 Mannahill, | ELVIRE P/L |
| SML 635 Mannahill, | ELVIRE P/L |
| EL 363, Mannahill Goldfield, | NEWMONT P/L |
| EL 584 Mount Victor, | CRA EXPLORATION P/L |
| EL 1161 Mannahill Goldfield, | JARMAND MINERALS & EXPLORATION P/L |
| EL 1164 Mannahill, | AMAX AUSTRALIA (GOLD) P/L |
| EL 1322 Teetulpa, | WESTERN MINING CORPORATION LTD |
| EL 1334 Wattle Dam, | WESTERN MINING CORPORATION LTD |
| EL 1346 Mannahill, | WESTERN MINING CORPORATION LTD |
| EL 1376 Hope Bank, | CRA EXPLORATION P/L |
| Followed by: | |
| EL 1961, Yunta - Mannahill, | EQUINOX RESOURCES NL |
| EL 2191 Mannahill, | NORSCOM P/L |
| AREA: | 1311 sq km, reducing to 547 sq km in May 1989 |
| COMMENCEMENT DATE: | 16.10.87 |
| EXPIRY DATE: | 15.01.90 |
| ENVELOPE: | 6971 Open File |
| DATA PLACED ON OPEN FILE: | May 1990 |
| REFERENCES: | M.I.Q. 57, March 1990, p 12 |
| LOCATION: | Mannahill Goldfield |
| 1:250 000 SHEET: | OLARY |
| 1:100 000 SHEET: | Yunta 6832, Winnininnie 6833, Anabama 6932, Olary 6933 |
| TARGETS: | Telfer-style Au, and fault/shear-related Au |
| AGE/ROCK UNITS: | Neoproterozoic Adelaidean Umberatana Group in the Nackara Arc |

EXPLORATION SUMMARY:
Similarities were noted to the Telfer deposits in WA, ie stratiform and stratabound ferruginous quartz veins (+ gold-pyrite-arsenopyrite-chalcopyrite-carbonate mineralisation) in anticlinal cores in mildly metamorphosed Late Proterozoic metasediments.

Extensive rock-chip sampling on grids at Royal Charlie, Westward Ho! Extended, Birthday, & Nectar was followed in September 1988 by 16 RAB holes (MH01-16) totalling 440m:

- 4 holes (MH01, 04-06, 117 m) at Spanish American / Homeward Bound Extended
- 6 holes (MH02, 03, 07-10, 130 m) at Nectar
- 3 holes (MH11-13, 92 m) at Aurora Australis
- 3 holes (MH14-16, 101 m) at Birthday.

Drilling revealed stratabound ferruginous, sideritic and sulphidic quartz veining in saddle-reefs at Spanish American and Nectar, and complex (sulphidic) quartz veining at Birthday and Aurora Australis. Gold assays were low, with the exception of the Nectar Prospect, with 620 ppb Au in the top 6m of MH07. Hallmark infer that the old miners had been unable to successfully extract gold from the ore, due to the fine nature of the gold, the limitations of their crushing technology, and the sulphidic nature of the ore (*Hallmark Gold NL, 1988. Fourth Quarterly Report for EL 1436 Mannahill, South Australia, 16 July 1988 to 15 October 1988. In Envelope 6971*)

MINERALISATION / PROSPECTS:
Mannahill Goldfield: Royal Charlie, Birthday, Aurora Australis, Nectar / No Gammon, Westward Ho!/Eudunda Hope, Euro, Trojan, Odd Trick, John Bull, Homeward Bound, Spanish American
Westward Ho!/Eudunda Hope & Royal Charlie (excised from EL)

Royal Charlie Mine is 3500 m NNE of its mis-plotted position on OLARY 1:250 000 geological sheet (*O'Hara, G., February 1988. First Quarterly Report, Mannahill Project, EL 1436, Olary District, South Australia, 16 October 1987 to 15 January 1988. Hallmark Gold NL. In Envelope 6971*)

Winnininnie Dome: stratiform gold in gossanous ironstone units & strike-parallel quartz veins in Tarcowie Siltstone

Morialpa Copper Prospect: arsenopyrite - pyrite - malachite - chalcopyrite in strike-extensive cross-cutting quartz veins in Willyama Supergroup quartz-muscovite schists.

The Morialpa Quartz Reef Prospect: copper mineralisation in quartz-ironstone segregations along the poorly-exposed contact between Willyama Supergroup basement and overlying Tapley Hill Formation.

DRILLING:
September 1988: 16 RAB holes (MH01-16) totalling 440m at Spanish American / Homeward Bound Extended, Nectar, Aurora Australis and Birthday.

| | |
|---|---|
| TENEMENT: | EL 1462 Lilydale |
| COMPANY: | CSR LTD,<br>sold in July 1988 to PLACER EXPLORATION LTD |
| Formerly: | |
| SML 282, | MINES ADMINISTRATION P/L |
| SML 555, 556, | LONGREACH METALS NL<br>and MINES ADMINISTRATION P/L |
| EL 16 Anabama, | SADM |
| EL 173 Anabama Hill, | SADM |
| EL 312, 508, 937 Cronje Dam, | CARPENTARIA EXPLORATION CO P/L |
| EL 1285 Cronje Dam, | THE SHELL CO OF AUSTRALIA LTD |
| Followed by: | |
| EL 1830 Anabama, | PLACER EXPLORATION LTD |
| EL 1838 Lilydale, | DOMINION GOLD OPERATIONS P/L |
| EL 2136 Cronje Dam, | COPPERFIELD GOLD NL |
| AREA: | 1484 sq km |
| COMMENCEMENT DATE: | 05.01.88 |
| EXPIRY DATE: | 04.01.93 |
| ENVELOPE: | 8011 Open File |
| DATA PLACED ON OPEN FILE: | September 1994 |
| REFERENCES: | M.I.Q. 75, September 1994, p 18 |

Gerdes, R.A., 1975. Induced Polarisation and Magnetic Surveys of the Anabama Copper Mine prospect and the Cronje Prospect (EL 16) OLARY 1:250 000 Sheet. *South Australia Department of Mines and Energy. Report Book* 75/60.

Morris, B.J., 1977. Exploration Licence 173 - Final report. An Investigation of Copper and Molybdenum Mineralisation at Anabama Hill and the Cronje Dam Prospect, OLARY 1:250 000. *South Australia Department of Mines and Energy. Report Book* 77/51

Morris, B.J., 1977. Porphyry-style Copper Molybdenum Mineralisation at Anabama Hill. *Mineral Resources Review, South Australia*, 150, p 24.

| | |
|---|---|
| LOCATION: | Near Lilydale Homestead, 80 km southeast of Yunta |
| 1:250 000 SHEET: | OLARY, CHOWILLA |
| 1:100 000 SHEET: | Yunta 6832, Anabama 6932, Oakvale 7032, Murkaby 6831 |
| TARGETS: | Starra-style gold in the Braemar Ironstone facies; sedimentary and volcanic-hosted base metal mineralisation; heavy minerals in Tertiary Murray Basin sands |
| AGE/ROCK UNITS: | Neoproterozoic Adelaidean, eg Braemar Ironstone;<br>and Tertiary Parilla Sand and Loxton Sand |

EXPLORATION SUMMARY

EL 1462 is an irregular shape, covering the northeasterly-trending Anabama - Redan Fault System, at the northern margin of the Murray basin, and south of outcropping Adelaidean metasediments of the Nackara Arc. The primary exploration target was gold in the Braemar Ironstone Facies based on the Lower to Mid-Proterozoic Starra and Trough Tank deposits in Queensland, in which gold and copper are concentrated in stratiform syngenetic iron formations; the Starra deposit is also associated with intrusive granites and contact metamorphism (*Circosta, G., January 1989. Exploration Licence 1462 Lilydale, South Australia. Report for Periods Ending 4th January, 1989. Placer Exploration Ltd, Report No SA5/89. In Envelope 8011*).

Prior RAB drilling by Carpentaria Exploration Co Pty Ltd over EL 937 from 1979-84 in extensive areas of basement with shallow cover led to the discovery of low grade disseminated copper mineralisation at the Anabama Mine prospect and the White Rock prospect (*Circosta, G., January 1989, In Envelope 8011, pp 058-059*).

In early 1988, CSR flew a detailed aeromagnetic and radiometric survey.

Reconnaissance rock sampling near the Eldorado Gold Mine, 3 km northeast of Lilydale Homestead revealed minor gold anomalism; 59.6 km of ground magnetics were completed at the Eldorado grid over "the complex magnetic zone between the Eldorado Mine and the Delamerian Anabama Granite contact some 4 km to the northeast" (*Circosta, G., November 1988. EL 1462 Lilydale. Quarterly Reports for Periods Ending 5th July and 5th October, 1988. Placer Exploration Ltd. In Envelope 8011*).

In late 1988, Placer Exploration Ltd undertook 4 IP traverses at Eldorado over magnetic anomalies, and collected 101 rock-chip samples over the Braemar Ironstone Facies (Umberatana Group, haematitic siltstone with lenses of tillitic material), Boucaut Volcanics (acid, intermediate, and basic, rhyolite to amygdaloidal basalt, amygdaloidal and porphyritic andesite; underlying basal Burra Group in anticlinal cores at Mutooroo; tentatively correlated with Wooltana Volcanics in base of Callana Group), and at known prospects. 10 RC percussion holes (LD1-10 & 7A) were completed, totalling 1013m; LD1-6 at Eldorado Grid, with minor Cu and Pb anomalism in LD1, 2, 6; LD7, 7A, 8 at Anabama Mine Grid, LD9 at Great Eastern Grid, and LD10 at Homestead were barren. Placer concluded that the potential for Starra-type mineralisation in Braemar Ironstone Facies was poor, but that potential remained for volcanic-hosted base metals (especially Cu-Au) in Boucaut Volcanics and for heavy mineral accumulations in beach sands on the northern margin of the Tertiary Murray Basin (*Circosta, G., January 1989, In Envelope 8011*).

In 1989, Placer completed a further 17.1 km of ground magnetics, followed by 248 RAB holes (holes have grid co-ordinates, not hole numbers) totalling 2742m on 10 N-S grid lines in the Anabama Mine area. This was followed by 9 angled RC (LD11-19) holes totalling 1052m, and a 87m diamond hole (LDD01). "Results of exploration were very encouraging with extensive low-grade copper mineralisation found to have associated patchy gold mineralisation. The main intersections are:

| | |
|---|---|
| LD 13 | 8m at 0.83 g/t Au, including 2m at 2.8 g/t Au |
| LD 14 | 10m at 0.9 g/t Au, including 8m at 10.78 g/t Au |
| LD 16 | 4m at 0.87g/t Au |

The mineralisation appears to be in a major north-east trending shear zone. Copper appears anomalous throughout this zone and gold in the footwall section of the shear zone" (*Circosta, G., January 1990. Exploration Licence 1462 Lilydale, South Australia. Report for Period Ending 4 January 1990. Placer Exploration Ltd, Report No SA3/90. In Envelope 8011*). The diamond hole was abandoned before target depth due to broken ground, intersecting a deeply weathered silicified epidote-chlorite shear zone with copper mineralisation.

Other RAB drilling included 6 reconnaissance holes (LD20-25) totalling 138m, south of Anabama Dam, revealing weak copper anomalism in quartz-mica schists. Ground magnetics were completed at Staker Dam, followed by 4 rotary-mud drillholes totalling 92m at Staker Dam, and 17 RAB drillholes totalling 572m at Amateur Dam. Heavy minerals comprised up to 1% of the sample, dominantly iron oxides with leucoxene, ilmenite, and minor zircon.

In 1990, extensive BLEG soil sampling programs by Placer, with samples at 40m spacing along traverse lines, defined anomalous Cu and Au-Cu-rich zones at Anabama grid and low-order Cu-Au anomalies at White Rock, and Two Brothers Prospect (*Circosta, G., August 1990. Exploration Licence 1462 Lilydale, South Australia. Report for Period Ending 4 July, 1990. Placer Exploration Ltd, Report No SA7/90. In Envelope 8011*). Later in 1990, infill BLEG sampling was completed at White Rock on lines at 200m spacing.

This was followed in October 1990 by 19 angled RC holes (LD20-38) totalling 2478m at Anabama, and 5 RC holes (LD39-43) totalling 678m at White Rock, to test the BLEG sampling anomalies and to extend drilling along strike from the previous drilling at Anabama (*Circosta, G., February 1991. Exploration Licence 1462 Lilydale, South Australia. Report for Period Ending 4 January, 1991. Placer Exploration Ltd, Report No SA6/91. In Envelope 8011*). Drilling at Anabama intersected weakly laminated biotite-quartz schists with interbedded calc-silicates; the lack of lithological continuity and marker units was attributed to facies change, itself a controlling

influence on the patchy distribution of copper mineralisation; north-dipping metasediments are cut by a steeply dipping metamorphosed biotite gabbro.
At White Rock, holes intersected interfingering? meta-acid and meta-basic volcanics; best intersections were 10.5% Cu over the top 14m in LD41, and 0.63 g/t Au for 14m from 38-52m in LD39.

In early 1991, 69 aircore holes (LA1-69), totalling 2061m, were completed on 6 traverse lines across the northeast to northern margin of the Tertiary Murray Basin to test for heavy minerals (HM) in the Pliocene Parilla and Loxton Sands; of 8 samples submitted for analysis, all except 1 contained in excess of 3.5% HM, with a peak of 15.7% HM; however the HM fraction is dominated by magnetite and iron oxides, indicating that "the source rocks in this area did not contain sufficient accessory minerals of ilmenite, zircon and rutile", and drilling failed to locate Parilla and Loxton Sands (*Circosta, G., May 1991. Exploration Licence 1462 Lilydale, South Australia. Report for Period Ending 4 April, 1991. Placer Exploration Ltd, Report No SA12/91. In Envelope 8011*).

In mid 1991, the focus of exploration returned to base and precious metals in the Adelaidean. A further 164 BLEG samples were collected, and 14 angled RC holes totalling 1286m were drilled, 9 holes (LDD 44-52, totalling 685m) at White Rock, and 5 holes (LDD53-57, totalling 601m) at Anabama Grid (*Campbell, N., July 1992. Exploration Licence 1462 Lilydale, South Australia. Report for Period 5 April 1991 to 4 July 1992. Placer Exploration Ltd, Report No SA6/92. In Envelope 8011*). At White Rock, drilling indicated the limited extent of Au mineralisation on the faulted? metasediment - volcanic contact, confirmed and the near-surface extension of the copper anomaly from previous Carpentaria Exploration Co drilling; a resistivity high was confirmed as silicified but not mineralised volcanics. The 5 RC holes at Anabama extended previous RC drilling, and intersected limonitic shears and abundant vein quartz in phyllite, with 0.45% Cu from 0-52m in LD53 (including 0.7% Cu and 0.51 g/t Au from 28-48m) and 0.65% Cu from 28-74m in LD54. Results were disappointing from 164 additional BLEG samples collected to the northeast of the Anabama Grid (*Campbell, N., July 1992, In Envelope 8011*).

In 1992, a 10 angled RC holes at Anabama Grid (LD58-67) totalling 1090m closed the anomaly off to the south, and tested contradictory trends of mineralisation between prior RAB and RC drilling. A 'rough resource' was calculated at 4 Mt at 0.6% Cu with a 0.1% Cu cut-off (*Campbell, N., July 1992, In Envelope 8011, p1044*), with patchy gold - best value was 0.6 grams/tonne from 80-83m in LD62; Campbell considered that Au in the footwall had been inadequately tested.

To the north (Anabama East Extension), 3 vertical RC holes drilled in 1991-2 (LDWB2-4, totalling 224m) tested the conformable Pualco Tillite - Benda Siltstone contact (*Campbell, N., July 1992, In Envelope 8011*). LDWB3 and 4 intersected sulphides and vein quartz in quartzite with minor amphibolite, and granite (dyke?) respectively, but with no significant anomalism.

In late 1992, reconnaissance BLEG sampling programs (73 samples) were completed at Eldorado Grid and Cocktail Dam, over the southwest of the Anabama Granite testing for skarn-type mineralisation, and testing a demagnetised and altered? zone. However assay results were disappointing (*Campbell, N., January 1993. Exploration Licence 1462 Lilydale, South Australia. Relinquishment and Final Exploration Report for Period 5 July 1992 to 4 January 1993. Placer Exploration Ltd, Report No SA3/93. In Envelope 8011*).

On 4th January 1993, Placer relinquished the majority of EL 1462, retaining a smaller tenement over the Anabama Mine - White Rocks grids (*Campbell, N., January 1993, In Envelope 8011*).

MINERALISATION / PROSPECTS:
Anabama Copper Mine, 3 km west of Division Dam, comprises pits and trenches and 3 shafts, in operation in 1909 (*Jones 1909*); malachite, cuprite and chalcocite in 3 ferruginous quartz veins sub-parallel to enclosing phyllite; production of 85 tones of ore for ~1 tonne of copper metal , with no record of mining or production. Mineralisation comprises copper oxides and carbonates, with some chalcocite in 3 parallel quartz veins up to 1m wide; minor copper-bearing limonitic vein quartz float for 1.5 km to east. RAB Drillholes CRD3 and CRD6 by Carpentaria Exploration Co Pty Ltd in 1982 near the mine intersected minor copper in amphybolitic phyllites, dolomite, marble, meta-dolerites, and antigorite-talc-dolomite schists with trace pyrite and chalcopyrite. CRD6 failed to intersect copper mineralisation beneath the mine. CRD7-10 intersected disseminated pyrite and chalcopyrite in fine-grained phlogopite-quartz schist or phyllite east of the mine, with maximum 4.3% copper over

2m in CRD10 from 96-98m (*Circosta, G., January 1989, In Envelope 8011, pp 054 & 61-62*). A low grade disseminated copper resource at Anabama Mine comprises 4 Mt at 0.6% Cu and patchy gold (*Campbell, N., July 1992, In Envelope 8011*).

At Anomaly F, Anabama Grid (east of Anabama Mine, 2 km west of Division Dam), RAB drillholes CRD4 & CRD5 by Carpentaria Exploration Co in 1982 intersected weak but persistent copper mineralisation, including 76m at 100 ppm in CRD4, and Zn up to 950 ppm, in metamorphosed magnetite-bearing basalts and dolerites, with lesser pale rhyolite schists (*Circosta, G., January 1989, In Envelope 8011, p 060*).

Anabama Hill copper - molybdenum prospect in Anabama Granite (*Circosta, G., January 1989, In Envelope 8011, p 057*)

Carpentaria Exploration Co drilling (WR1, WR2, totalling 162m) revealed low grade disseminated copper mineralisation at the White Rock Prospect; drillholes WR1 and WR2 totalling 162m in 1978, and RAB drillholes CRD11-15 in 1982 for Carpentaria Exploration Co in 1982 intersected disseminated copper in the central 700m of a 1500m long geochemical anomaly, within metamorphosed (greenschist facies) basalts / dolerites and lesser silicified dacites / rhyodacites (*Circosta, G., January 1989, In Envelope 8011, pp 058-061*)

The Eldorado Gold Mine, 3 km northeast of Lilydale Homestead, comprises shallow pits on shallowly dipping quartz veins up to 20 cm wide, in crenulated schist and phyllitic siltstone (ferruginous in part). There is no record of mining or production (*Circosta, G., January 1989. In Envelope 8011, pp 054, 065*); reconnaissance sampling indicated minor Au anomalism. In late 1988, Placer completed 6 percussion holes (LD1-6), totalling 730m at Eldorado grid, with minor Cu and Pb anomalism in LD1, 2, 6 (*Circosta, G., January 1989, In Envelope 8011, pp 071-073*).

Two Brothers Ridge Prospect (also known as Two Brothers Prospect) a 6m deep shaft on malachite-stained quartz-chlorite schist, with no record of mining or production. RAB drillholes CRD1 & CRD2 in 1982 by Carpentaria Exploration Co in 1982 intersected minor disseminated pyrite & chalcopyrite (*Circosta, G., January 1989, In Envelope 8011, pp 054, 060*).

At Great Eastern Dam Grid , RAB drillhole LD9 in late 1988 by Placer was barren (*Circosta, G., January 1989, In Envelope 8011*).
At Homestead Grid, RAB drillhole LD10 in late 1988 by Placer was barren (*Circosta, G., January 1989, In Envelope 8011*).
Cronje Prospect, near Two Brothers Ridge (SADM under EL 173) (*Circosta, G., January 1989, In Envelope 8011, p 057*).
Netley Hill copper - molybdenum prospect in Anabama Granite (*Circosta, G., January 1989, In Envelope 8011, p 057*).

DRILLING (see Table 2 for details)
Base and precious metals (at Eldorado Grid, Anabama Grid / Anabama Mine area, Anabama East Extension, Great Eastern, Homestead, and White Rock):
254 RAB holes for 2880m
67 RC holes for 7839m
1 diamond hole, 87m
Totalling 322 holes for 10806m
Heavy minerals:
90 holes for 2725m

TOTAL: 412 holes for 13531m

**TABLE 2:** **EL 1462 Lilydale, PLACER EXPLORATION LTD, 1988 - 92 DRILLING SUMMARY**

| YEAR | No of HOLES | HOLE TYPE | HOLE No's | METREAGE | TARGET AREA |
|---|---|---|---|---|---|
| Targeting Starra-style gold in the Braemar Ironstone facies etc, and volcanic-hosted base metals in Boucaut Volcanics: | | | | | |
| Late 1988 | 11 | RC | LD1-10 & 7A | 1031m | LD1-6 at Eldorado Grid<br>LD7, 7A, 8 at Anabama<br>LD9 at Great Eastern<br>LD10 at Homestead |
| 1989 | 248 | RAB | - | 2742m | Anabama Mine area |
| | 9 | angled RC | LD11-19 | 1052m | Anabama Mine area |
| | 1 | diamond | LDD01 | 87m | Anabama Mine area |
| | 6 | RAB | LD20*-25 | 138m | south of Anabama Dam. |
| October 1990 | 19 | RC | LD20*-38 | 2478m | Anabama (*note some contradiction in hole no's) |
| | 5 | RC | LD39-43 | 678m | White Rock |
| Mid 1991 | 9 | angled RC | LDD44-52 | 685m | White Rock |
| | 5 | angled RC | LDD53-57 | 601m | Anabama Grid |
| 1992 | 10 | angled RC | LD 58-67 | 1090m | Anabama Grid |
| | 3 | vertical RC | LDWB2-4 | 224m | Anabama East Extension |
| TOTAL | 254 RAB holes for 2880m<br>67 RC holes for 7839m<br>1 diamond hole, 87m | | | | |
| Totalling | 322 holes for 10806m | | | | |
| Targeting heavy mineral accumulations on the northern margin of the Tertiary Murray Basin: | | | | | |
| 1989 | 4 | rotary-mud | - | 92m | Staker Dam |
| | 17 | RAB | - | 572m | Amateur Dam |
| Early 1991 | 69 | aircore | LA1-69 | 2061m | 6 traverse lines across the northeast to northern margin of the Tertiary Murray Basin |
| Totalling | 90 holes for 2725m | | | | |
| **TOTAL (base & precious metals, & heavy minerals):** | **412 holes for 13531m** | | | | |

| | |
|---|---|
| TENEMENT: | EL 1470 Yunta - Paratoo |
| COMPANY: | MOUNT STREET SECURITIES |
| transferred on 14.03.89 to | YUNTA GOLD PTY LTD |
| joint venture with | FAIRVIEW GOLD PTY LTD |
| Formerly: | - |
| Followed by: | - |
| AREA: | 1156 sq km |
| COMMENCEMENT DATE: | 01.03.88 |
| EXPIRY DATE: | 31.05.90 |
| ENVELOPE: | 8049 Open File |
| DATA PLACED ON OPEN FILE: | July 1990 |
| REFERENCES: | - |
| LOCATION: | west of Yunta - Paratoo |
| 1:250 000 SHEET: | OLARY, ORROROO |
| 1:100 000 SHEET: | Yunta 6832, Winnininnie 6833, Paratoo 6732, Koonamore 6733 |
| TARGETS: | Stratabound? Au, and structurally emplaced Cu |
| AGE/ROCK UNITS: | Neoproterozoic Adelaidean metasediments of the Nackara Arc, especially Umberatana Group |

EXPLORATION SUMMARY:
Exploration included detailed geological mapping and sampling (*Greene, F.F., August 1988 to June 1989. Exploration Licence 1470 Paratoo Area, Adelaide Geosyncline, South Australia, First to Fourth Quarterly Reports for the Periods ending 1 June 1988 to 1 March 1989. Mount Street Securities Ltd. In Envelope 8049*), especially around the Paratoo Cu deposit (on ORROROO 1:250 000 map sheet), delineating potential stratigraphic and structural traps.

A subsequent review of previous data and exploration to date downgraded the potential of the Paratoo area for commercial copper oxide mineralisation, but considered that there remained potential for Au mineralisation in the axial zone of the dome (*Curtis, J.L., November 1989. Exploration Licence 1470, Paratoo Project, SA, Technical Assessment. Fairview Gold Pty Ltd. In Envelope 8049*).

MINERALISATION / PROSPECTS:
Paratoo Cu deposit ( on ORROROO 1:250 000 map sheet, with detailed description)
Nob Cu Mine (with brief description)
Three un-named Cu mines/prospects (with brief descriptions):
east of Mount Dare
Oak Park Station
Panaramitee Station
All are ferruginous, ‘lode-controlled’ copper oxide/carbonate

DRILLING: Nil

| | |
|---|---|
| TENEMENT: | EL 1476 Oakvale |
| COMPANY: | PEREGRINE RESOURCES (AUSTRALIA) NL |
| Formerly: | |
| SML 393 (OLARY, CHOWILLA), | SEDIMENTARY URANIUM NL |
| Followed by: | |
| in part by EL 1612 Oakvale, | PEREGRINE RESOURCES (AUSTRALIA) NL |
| AREA: | 1606 sq km |
| COMMENCEMENT DATE: | 28.03.88 |
| EXPIRY DATE: | 27.03.89 |
| ENVELOPE: | Envelope 8005 Open File<br>Envelope 8261 Open File<br>Envelope 8059 Open File |
| DATA PLACED ON OPEN FILE: | July 1992 |
| REFERENCES: | - |
| LOCATION: | 80 km southeast of Olary, north of Danggali Conservation Park |
| 1:250 000 SHEET: | OLARY, CHOWILLA |
| 1:100 000 SHEET: | Oakvale 7032, Canopus 7031 |
| TARGETS: | Heavy Minerals |
| AGE/ROCK UNITS: | Tertiary Murray Basin sediments, especially Pliocene Parilla Sand / Loxton Sand |

EXPLORATION SUMMARY:
Sedimentary Uranium NL had previously intersected heavy minerals in the area of EL 1476. Reconnaissance aircore drilling (29 drillholes, OK 1-29, totalling 1319m) in August 1988 intersected Parilla Sand in each hole, and revealed some low-grade heavy minerals; follow-up aeromagnetics and radiometrics over EL 1476 in conjunction with EL 1510 Quondong Vale, adjacent to the west.

In January-February 1989, a further 66 aircore drillholes (OK30-95) totalling 2385m (though drill logs indicate 2808m) were completed on 5 north-south traverses at Brooks Dam Grid in the southeast of EL 1476, and indicated heavy minerals were generally less than 1%, with higher values at depth (*Peregrine Resources (Australia) NL, 1988 - 1990. Progress / Quarterly Reports for EL 1476 Oakvale. In Envelope 8005*).

Envelope 8059 includes Peregrine Resources map for EL 1510, but also indicating 27 drillhole locations on 4 north-northwest traverses across EL 1476; these holes appear to not have been reported.

MINERALISATION / PROSPECTS:
Brooks Dam Grid

DRILLING:

| | |
|---|---|
| August 1988: | 29 aircore drillholes (OK1-29) totalling 1319m |
| early 1989: | 66 holes totalling 2385m. |

| | |
|---|---|
| TENEMENT: | EL 1479 Copperlinka |
| COMPANY: | BHP - UTAH MINERALS DIVISION |
| Formerly: | |
| EL 1102 Copperlinka, | UTAH DEVELOPMENT CO LTD |
| Followed by: | |
| EL 1711 Copperlinka, | AZTEC MINING CO LTD |
| EL 2185 Outalpa, | OXFORD RESOURCES P/L |
| AREA: | 165 sq km |
| COMMENCEMENT DATE: | 05.04.88 |
| EXPIRY DATE: | 04.04.89 |
| ENVELOPE: | 5020 Open File |
| DATA PLACED ON OPEN FILE: | April 1989 |
| REFERENCES: | - |
| LOCATION: | 25 km south of Olary |
| 1:250 000 SHEET: | OLARY |
| 1:100 000 SHEET: | Olary 6933, Anabama 6932 |
| TARGETS: | Stratabound Au |
| AGE/ROCK UNITS: | Neoproterozoic Adelaidean Umberatana Group and Burra Group |

EXPLORATION SUMMARY:
No action since EL 1102 (*Lindeman, T, April 1989. Exploration Licence 1479 Copperlinka, South Australia, Final Report. BHP - Utah Minerals International, Report No CR 6420. In Envelope 5020*)
See EL 1102 (this volume) for map.

MINERALISATION / PROSPECTS:
Includes part of Wadnaminga Goldfield

DRILLING: Nil

| | |
|---|---|
| TENEMENT: | EL 1490 Teetulpa Goldfield |
| COMPANY: | COVE MINING NL |
| Formerly: | |
| EL 1098 Teetulpa Goldfield, | JARMAND MINERALS & EXPLORATION P/L |
| EL 1226 Teetulpa Goldfield, | JARMAND MINERALS & EXPLORATION P/L |
| EL 1322 Teetulpa Goldfield, | WESTERN MINING CORPORATION LTD |
| EL 1413 Teetulpa Goldfield, | THOMDRILL P/L |
| Followed by: | |
| EL 2126 Teetulpa Goldfield, | MINTECH RESOURCES P/L |
| AREA: | 46 sq km |
| COMMENCEMENT DATE: | 20.05.88 |
| EXPIRY DATE: | 19.11.88 |
| ENVELOPE: | No Envelope |
| DATA PLACED ON OPEN FILE: | No data supplied |
| REFERENCES: | - |
| LOCATION: | 60 km west of Olary |
| 1:250 000 SHEET: | OLARY |
| 1:100 000 SHEET: | Winnininnie 6832 |
| TARGETS: | Au |
| AGE/ROCK UNITS: | Neoproterozoic Adelaidean, especially Wilyerpa Formation and Tindelpina Shale / Tapley Hill Formation. |
| EXPLORATION SUMMARY: | No exploration reported (EL Docket 1490) |
| MINERALISATION / PROSPECTS: | |
| Teetulpa Goldfield | |
| DRILLING: | Nil |

| | |
|---|---|
| TENEMENT: | EL 1510 Quondong Vale |
| COMPANY: | PEREGRINE RESOURCES (AUST) NL |
| Formerly: | - |
| Followed by: | - |
| AREA: | 1502 sq km |
| COMMENCEMENT DATE: | 02.09.88 |
| EXPIRY DATE: | 01.03.89 |
| ENVELOPE: | 8059 Open File |
| DATA PLACED ON OPEN FILE: | July 1989 |
| REFERENCES: | - |
| LOCATION: | 80 km south of Olary, northwest of Danggali Conservation Park |
| 1:250 000 SHEET: | OLARY, CHOWILLA |
| 1:100 000 SHEET: | Lilydale 6931, Anabama 6932, Canopus 7031 |
| TARGETS: | Heavy Minerals |
| AGE/ROCK UNITS: | Tertiary Murray Basin sediments, especially Pliocene Parilla Sand / Loxton Sand |

EXPLORATION SUMMARY:
Exploration included aeromagnetics and radiometrics over part of EL 1510, in conjunction with EL 1476 Oakvale adjacent to the east. Sedimentary Uranium NL had previously intersected heavy minerals in the area of EL 1476.

In early 1989, 4 reconnaissance (WT1-4) aircore drillholes totalling 171m failed to intersect Parilla Sand, indicating its probable absence. Minor heavy minerals were dominantly goethite.

MINERALISATION / PROSPECTS: Nil

DRILLING:
Early 1989: 4 (WT1-4) aircore drillholes totalling 171m

| | |
|---|---|
| TENEMENT: | EL 1528 Giles Knob |
| COMPANY: | BATTLE MOUNTAIN (AUSTRALIA) INC |
| Formerly: | |
| SML 556, | MINES ADMINISTRATION P/L<br>LONGREACH METALS NL |
| EL 1163 Giles Nob,<br>taken over in April 1984 by | UTAH DEVELOPMENT CO<br>THE BROKEN HILL PROPRIETARY CO. LTD |
| Followed by: | - |
| AREA: | 200 sq km |
| COMMENCEMENT DATE: | 12.10.88 |
| EXPIRY DATE: | 21.12.89 (surrendered) |
| ENVELOPE: | 8060 Open File |
| DATA PLACED ON OPEN FILE: | February 1990 |
| REFERENCES: | M.I.Q. 57, March 1990, pp 12-13 |
| LOCATION: | Taltabooka area, 30 km southeast of Wadnaminga |
| 1:250 000 SHEET: | OLARY |
| 1:100 000 SHEET: | Anabama 6932 |
| TARGETS: | Gold |
| AGE/ROCK UNITS: | Neoproterozoic Adelaidean metasediments (Burra & Umberatana Groups) in the Wadnaminga Anticline, Nackara Arc; Delamerian intrusive Anabama Granite?. |

EXPLORATION SUMMARY:
Exploration comprised 66 line km of ground magnetics at the Golden Sophia - Luron prospect, followed in October 1988 by 8 angled RC drillholes (GS01-08) totalling 400m on 2 traverses, targeting contact features inferred from ground magnetics, between metasediments and intrusive Anabama Granite?. Best results were:

| | |
|---|---|
| GS2, | 2m (16-18m) at 1.52 g/t Au |
| GS3, | 6m (14-20m) at 1.07 g/t Au |
| | 6m (32-38m) at 3.04 g/t Au |
| GS4, | 2m (14-16m) at 3.53 g/t Au |
| | 4m (24-28m) at 0.6 g/t Au |
| | 2m (36-38m) at 1.36 g/t Au |

in micaceous sandstones with disseminated oxidised sulphides and minor vein quartz (*Hextall, C.A., January 1989. Golden Sophia Project, SA. Exploration Licence 1528. First Three Monthly Progress Report, 12 October 1988 to 11 January 1989. Battle Mountain (Australia) Inc. In Envelope 8060*).

A further 19 line km of ground magnetics and a gradient array IP survey was followed in March 1989 by 28 angled open-hole RAB drillholes (GS09-36) totalling 1140m on 4 traverses at Golden Sophia - Luron. Drilling outlined a large pervasively mineralised system related to a broad magnetic high 300 by 700m in extent, but failed to intersect significant mineralisation, with few values better the 1 g/t Au (*Field, T.W., July 1989. Golden Sophia Project, SA. Exploration Licence 1528. Third Three Monthly Progress Report, 12 April 1989 to 12 July 1989. Battle Mountain (Australia) Inc. In Envelope 8060*).

Soil sampling (199 samples over 750 $m^2$) indicated a strong Au response over the east-west Luron mineralised zone intersected in drilling, and petrology of drilling samples indicated that silicification and potash metasomatism of the host rocks indicate 'that mineralisation is related to the intrusion of a felsic, magnetite series granitoid, inferred to be comparable to Carlin-style mineralisation' (*Field, T.W., January 1989. Golden Sophia Project, SA. Exploration Licence 1528. Fifth and Final Quarterly Progress Report, 12 October 1989 to 12 January 1990. Battle Mountain (Australia) Inc. In Envelope 8060*). No visible gold

was seen, and it was interpreted that gold is locked in pyrite. It was believed that the potential for economic tonnages was low.

MINERALISATION / PROSPECTS:
southeast portion of Wadnaminga Goldfield:
Golden Sophia Mine
Luron Mine
Edmonde Prospect (is this the same as Esmonde Prospect?)

DRILLING, at Golden-Sophia - Luron:
October 1988: 8 angled RC drillholes (GS01-08) totalling 400m.
March 1989: 28 angled RAB drillholes (GS09-36) totalling 1140m.

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|---|---|
| TENEMENT: | EL 1593 Ethiudna Hill |
| COMPANY: | ADELAIDE CHEMICAL CO. LTD |
| Formerly: | - |
| Followed by: | |
| Replaced in part by Mineral Claim MC 2531 on 29.06.90 | ADELAIDE CHEMICAL Co. Ltd; |
| Converted to Mineral Lease ML 5780 on 10.01.92, expiring 09.01.99 | ADELAIDE CHEMICAL Co. Ltd, transferred to MINERALS CORPORATION Ltd on 03.08.95 |
| EL 2258 Ethiudna, | EQUINOX RESOURCES NL |
| AREA: | 73 sq km |
| COMMENCEMENT DATE: | 18.07.89 |
| EXPIRY DATE: | 17.07.90 |
| ENVELOPE: | 8256 Open File |
| DATA PLACED ON OPEN FILE: | September 1990 |
| REFERENCES: | M.I.Q. 59, September 1990, p 10 |
| LOCATION: | Ethiudna |
| 1:250 000 SHEET: | OLARY, CURNAMONA |
| 1:100 000 SHEET: | Winnininnie 6833, Curnamona 6834 |
| TARGETS: | Wollastonite |
| AGE/ROCK UNITS: | Palaeoproterozoic Willyama Supergroup |

EXPLORATION SUMMARY:
No field work was undertaken only limited metallurgical and marketing work on the Ethiudna wollastonite deposit (*M.I.Q*. 59, September 1990, p 10, and EL Summary Sheet).

MINERALISATION / PROSPECTS: Ethiudna wollastonite deposit

DRILLING: Nil

| | |
|---|---|
| TENEMENT | part EL 1611 Mutooroo Station |
| COMPANY: | SOUTHERN VENTURES NL |
| transferred in April 1992 to | DOMINION METALS PTY LTD |

Formerly:

| | |
|---|---|
| SMLs 44, 52, 64, 79, 105, 179 285, 285a, 572, 698, Mutooroo - Ballara, | MINES EXPLORATION P/L<br>Joint Venture with NORANDA |
| SML 263, | ESSO EXPLORATION & PRODUCTION AUST. INC |
| SML 274 Radium Hill - Mutooroo, | LONGREACH METALS NL |
| EL 73 Mutooroo Copper Mine, | MINES EXPLORATION P/L |
| EL 255 | Mutooroo, CARPENTARIA EXPLORATION COMPANY P/L |
| EL 274, 356, 555, Trinity Mine, | AUSTRALIAN SELECTION P/L (SELTRUST MINING CORP. P/L) |
| EL 873 Pine Creek - Mutooroo, | ESSO EXPLORATION & PROD. AUST. LTD<br>and JONES MINING NL |

Followed by:

| | |
|---|---|
| EL 1637 Mutooroo, | BHP MINERALS LTD |
| EL 1832 Dingo Dam, | MOUNT ISA MINES LTD |

| | |
|---|---|
| AREA: | 1661 sq km, reducing to 1127 sq km in 1991 |
| COMMENCEMENT DATE: | 11.09.89 |
| EXPIRY DATE: | 06.09.94 (surrendered) |
| ENVELOPE: | 8226 Open File |
| DATA PLACED ON OPEN FILE: | October 1994 |
| REFERENCES: | M.I.Q. 76, December 1994, p 10 |
| LOCATION: | Northern margin of Murray Basin, near Mutooroo, 50 km southeast of Olary |
| 1:250 000 SHEET: | OLARY |
| 1:100 000 SHEET: | Anabama 6932, Olary 6933, Oakvale 7032, Mingary 7033 |
| TARGETS: | Heavy minerals, base metals, magnetite, talc, graphite |
| AGE/ROCK UNITS: | Tertiary sediments along northern margin of Murray Basin; Neoproterozoic Adelaidean volcanics and metasediments |

EXPLORATION SUMMARY

In 1989, following an assessment of prior drilling (predominantly for sedimentary uranium, by Tricentrol Australia Ltd, Mines Administration Pty Ltd, and sedimentary Uranium NL), Southern Ventures NL completed a program of 28 aircore drillholes (MAC1-28) totalling 744m, targeting possible heavy mineral accumulations in Tertiary sediments along northern margin of Murray Basin in the vicinity of Jubilee and Mulga Dams (the planned program of 9050m of drilling was shortened due to drilling difficulties). The sands were immature (poor sorting, angular) and micaceous, with an inferred fluvial origin from Willyama Supergroup metasediments to the north; anomalous $TiO_2$ and $ZrO_2$ were intersected in silty interbeds too fine grained for economic recovery; best intersection was 3m at 1.12% TiO2 and 600 ppm ZrO2 in drillhole MAC5, 33-36m. (*Ward, C.W., December 1989. Mutooroo project, EL 1611. Report for the Three Month Period 11 September to 11 December 1989 to South Australian Department of Mines and Energy. Southern Ventures NL Report. In Envelope 8226*).

In 1991, the focus of exploration moved to base metals within Adelaidean underlying shallow Tertiary cover. Image processing and interpretation of aeromagnetic data by Aerodata Holdings Ltd identified 7 anomalies (Border, Perseverance, Jubilee, Sunrise [or Surprise?, the text and maps differ], Alderman's, Maldorky, Cockrum's) in Adelaidean metasediments and volcanics on or close to the north of the Anabama - Redan Fault Zone (*Wills, K.J.A., May 1992. Mutooroo. Report for the Quarter Ending 10 June 1991, EL 1611 Mutooroo, South Australia. Dominion Mining Ltd. In Envelope 8226*). EL 1611 contains little outcrop. Palaeoproterozoic Willyama Supergroup metasediments outcrop near Mutooroo Station in the

northeast. At Mutooroo Ridge, sheared and foliated Boucaut Volcanics (acid and intermediate) of Willouran age are in contact with Emeroo Subgroup (arkose and conglomerate) at the base of the Burra Group. Most outcrop in EL 1611 is Sturtian Pualco Tillite and overlying Benda Siltstone, with horizons of Braemar Ironstone Facies (*Turner, G.R., and Wills, K.J.A., April 1993. Report on Exploration Licence No 1611, Mutooroo, South Australia, for the Six Months Ending 10 December, 1992. Dominion Metals Pty Ltd. In Envelope 8226*).

In 1991, Southern Ventures completed 10 km of ground magnetics across the 7 interpreted aeromagnetic targets, followed in June 1991 by 3 RAB holes (MUR1-3) totalling 132m, which failed to penetrate Cainozoic cover. In June-July 1991, 46 aircore drillholes (MAC29-74) totalling 4056m were completed, intersecting Adelaidean metasediments and calc-silicates, deeply weathered in part; no granites were intersected. Encouraging results were obtained at Maldorky prospect, Line 6, where 3 drillholes (MAC71-73) yielded anomalous copper, zinc and gold assays in magnetite-bearing Adelaidean metasediments with an atypical albite-actinolite-epidote mineral assemblage, interpreted as epigenetic replacement of favourable horizons in sediments adjacent to the Ordovician Anabama Granite (*Tonkin, D.G., October 1991. Mutooroo Exploration Licence 1611, South Australia. Quarterly Report for the Period Ended 10 September 1991. Southern Ventures NL. In Envelope 8226*).

In the Cainozoic intersections, "titanium levels were almost universally high" with a weighted average of 0.66% Ti over 25m, at an average depth of 19.5m to top of Ti-bearing intersection. Maximum Ti was 1.07%.

In November 1991, Southern Ventures NL completed a further 28.6 km of ground magnetics at Maldorky prospect, followed by 42 vertical (MAC109 was angled) aircore drillholes (MAC75-88, 88A (waterbore), 89-115) totalling 4112m, on 5 grid lines at 500m spacing. Drilling outlined an 2 anomalous geochemical zones, beneath 70m of Tertiary cover, associated with Mg-rich interbeds; the larger is 200-400m wide, sub-parallel to the strike of the enclosing steeply dipping Adelaidean metasediments, and in excess of 2000m long and open to the north and south; maximum values were 2210 ppm Cu, 2132 ppm Zn, and 735 ppm Pb. A separate undefined zone contained up to 1.04% Zn and 615 ppm Pb. (*Tonkin, D.G., February 1992. Mutooroo Exploration Licence 1611, South Australia. Quarterly Report for the Period Ended 10 December 1991. Southern Ventures NL. In Envelope 8226*).

In late 1991, EL 1611 was reduced to 1127 sq km, as Southern Ventures NL relinquished portions not containing the 7 identified aeromagnetic anomalies.

In early 1992, Dominion Metals Pty Ltd completed a further 40 km of ground magnetics at Maldorky and 15.5 km of ground TEM, followed in February-April by 25 aircore drillholes (MAC116-140) totalling 2139m, and in March by 2 angled diamond drillholes (92MD-1 and 92MD-2) totalling 243m of aircore precollar and 278m of diamond coring. Significant intersections were:

| | Cu ppm | Pb ppm | Zn ppm | Au ppm |
|---|---|---|---|---|
| 92MD-1, 6m (183-189m): | 2254 | 9 | 11 | 10 |
| 92MD-2, 14m (180-194m): | 400 | 53 | 338 | 2 |
| 92MD-2, 57m (214-271m): | 1101 | 10 | 152 | 6 |
| including 8m (263-271m): | 3110 | 7 | 239 | 17 |

Drillhole 92MD-2 from 180-194m is a zone of hydro-fracturing of quartz-muscovite schist, containing visible chalcopyrite, sphalerite, and galena in veins infilling open spaces in the breccia. The other intersections were native copper on joint and schistosity surfaces with minor chalcopyrite, limonite, and chrysocolla. What was "previously thought [to] be stratiform syngenetic or stratabound skarn-style mineralisation has been shown to be a disseminated-transgressive epigenetic style of mineralisation related to granitic intrusive activity during Delamerian regional metamorphism" (*Tonkin, D.G., Johnson, R.D., and Wills, K.J.A., April 1993. Mutooroo Exploration Licence 1611, South Australia. Report for the Half-Yearly Period Ended 10 June 1992. Dominion Metals Pty Ltd. In Envelope 8226*).

In June 1992, a regional drilling program of 101 aircore holes (MAC141-241, and MAC163A, MAC163B totalling 5158m), at 2 by 2 km or 1 by 1 km spacing over an 18 km by 18 km grid in the northwest of EL

1611, confirmed the presence of a new granitoid (the 'Cornwall Granite' - which "is thought to have produced the hydrothermal activity which generated the greisen-style alteration and mineralisation" at Maldorky) on the western margin of EL 1611, and indicated a NNE trending zone of base metal anomalism passing through Maldorky and Radium Hill (*Tonkin, D.G., Johnson, R.D., and Wills, K.J.A., April 1993. In Envelope 8226*).

In late 1992, Dominion reprocessed available prior aeromagnetic data (jointly with aeromagnetic data for Dominion's adjacent EL 1782 Anabama), identifying granite subcrop, and both igneous and structural (eg dextral splay shears at $085^0$ - $100^0$ off the $055^0$-$060^0$ Anabama - Redan Shear Zone; and $045^0$ shears) control of mineralisation in the Maldorky area etc. In October 1992, Dominion completed a program of 28 RAB drillholes (MRB242-270) totalling 868m over an area of circular and linear aeromagnetic lows extending northeast of Maldorky prospect towards Alderman's prospect; holes were at 200m apart on lines at 1 km spacing. Drilling intersected strongly greisenised sediments (inferred to be associated with a granitoid). Elevated Zn and Pb were obtained near the margins of a strong quartz-sericite alteration zone (the circular aeromagnetic low); elevated Cu is associated with quartz-sericite+tremolite/talc alteration (*Turner, G.R., and Wills, K.J.A., April 1993. Report on Exploration Licence No 1611, Mutooroo, South Australia, for the Six Months Ending 10 December, 1992. Dominion Metals Pty Ltd. In Envelope 8226*)

(The northern portion of the area of EL 1611 includes Willyama Supergroup metasediments northwest of the MacDonald Hill Fault, and was covered by ELs EL 1810 Duffields Dam for M.I.M. Exploration Pty Ltd and 2046 Mutooroo / Duffields for North Mining Ltd etc, as detailed in McCallum, 1997b).

MINERALISATION / PROSPECTS:
Maldorky prospect
Alderman prospect

NAMED AEROMAGNETIC ANOMALIES:
Border, Perseverance, Jubilee, Sunrise (or Surprise?), Alderman's, Maldorky, Cockrum's

DRILLING:
Potential heavy mineral accumulations in Tertiary sediments along northern margin of Murray Basin
1989: 28 aircore drillholes (MAC1-28) totalling 744m

Base metals in Boucaut Volcanics & Burra Group
1991:
3 RAB holes (MUR1-3) totalling 132m
46 aircore drillholes totalling 4056m, at 7 aeromagnetic anomalies on/near the Anabama - Redan Fault Zone
42 aircore drillholes (MAC75-115 & MAC88A) totalling 4112m on 5 grid lines at 500m spacing at Maldorky prospect

1992:
Maldorky prospect (in February-April), 25 aircore drillholes (MAC116-140) totalling 2139m,
Maldorky prospect (in March), 2 angled diamond drillholes:
92MD-1 ( 102m of aircore precollar and 137.3m of diamond coring),
92MD-2 (141m of aircore precollar and 140.9m of diamond coring)
a regional drilling program (in June) over an 18 km by 18 km grid in the northwest of EL 1611 comprised 101 aircore holes (MAC141-241, and MAC163A, MAC163B) totalling 5158m.
28 RAB drillholes (MRB242-270) totalling 868m between Maldorky and Alderman prospects (in October)

| | | |
|---|---|---|
| **TOTAL** | 28 air-core drillholes, | totalling 744m |
| | 232 RC drillholes, | totalling 16208m |
| | 2 diamond drillholes, | totalling 521m. |

| | |
|---|---|
| TENEMENT: | EL 1612 Oakvale |
| COMPANY: | PEREGRINE RESOURCES (AUSTRALIA) NL |
| Formerly:<br>EL 1476 Oakvale, | <br>PEREGRINE RESOURCES (AUSTRALIA) NL |
| Followed by: | - |
| AREA: | 275 sq km |
| COMMENCEMENT DATE: | 11.09.89 |
| EXPIRY DATE: | 10.09.90 |
| ENVELOPE: | 8005 Open File |
| DATA PLACED ON OPEN FILE: | January 1991 |
| REFERENCES: | - |
| LOCATION: | 80 km southeast of Olary, north of Danggali Conservation Park |
| 1:250 000 SHEET: | OLARY, CHOWILLA |
| 1:100 000 SHEET: | Oakvale 7032, Canopus 7031 |
| TARGETS: | Heavy Minerals |
| AGE/ROCK UNITS: | Tertiary Murray Basin sediments, especially Pliocene Parilla Sand |

EXPLORATION SUMMARY:

Exploration comprised 45 km of ground traverses with a hand-held spectrometer (EL Docket 1612).

MINERALISATION / PROSPECTS: Nil

DRILLING: Nil

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|---|---|
| TENEMENT: | EL 1619 Dlorah Downs |
| COMPANY: | RESOLVE RESOURCES NL |
| Formerly: | - |
| Followed by: | - |
| AREA: | 624 sq km |
| COMMENCEMENT DATE: | 30.10.89 |
| EXPIRY DATE: | 29.04.90 |
| ENVELOPE: | No Envelope |
| DATA PLACED ON OPEN FILE: | No data |
| REFERENCES: | M.I.Q. 58, June 1990, p 14 |
| LOCATION: | Anabama Hill - Benda Range |
| 1:250 000 SHEET: | OLARY |
| 1:100 000 SHEET: | Anabama 6932 |
| TARGETS: | Au |
| AGE/ROCK UNITS: | Neoproterozoic Adelaidean metasediments |

EXPLORATION SUMMARY: No data received.

MINERALISATION / PROSPECTS: -

DRILLING: -

| | |
|---|---|
| TENEMENT: | EL 1657 Nilpena Hill |
| COMPANY: | AZTEC MINING CO. LTD |
| Formerly: | - |
| Followed by: | - |
| AREA: | 440 sq km, reducing to 203 sq km in early 1991 |
| COMMENCEMENT DATE: | 17.05.90 |
| EXPIRY DATE: | 05.11.91 (surrendered) |
| ENVELOPE: | 8325 Open File |
| DATA PLACED ON OPEN FILE: | March 1992 |
| REFERENCES: | Brown 1908<br>M.I.Q. 64, December 1991, p 8 |
| LOCATION: | Maldorky area within the Benda Ranges, 25 km southeast of Olary |
| 1:250 000 SHEET: | OLARY |
| 1:100 000 SHEET: | Olary 6933, Mingary 7033 |
| TARGETS: | Sediment-hosted disseminated Au; base metals |
| AGE/ROCK UNITS: | Neoproterozoic Adelaidean Burra and Umberatana Groups, especially Wilyerpa Formation |

EXPLORATION SUMMARY:
Exploration in the vicinity of the Maldorky workings, in Wilyerpa Formation in the Benda Ranges on the southern flank of the Ulupa Syncline, comprised detailed geological mapping, and stream and rock-chip sampling, around the Maldorky Gold Anomaly, a 250m by 500m zone of supergene Cu-Au-Ag mineralisation in the vicinity of old mine workings, in tensional fractures in the axial zone of a southerly plunging minor anticline; previous sampling indicated up to 32 g/t Au in densely fractured sandstone associated with supergene copper (*Greene, F.F., August 1990. Exploration Licence 1657, Nilpena Hill area, Adelaide Geosyncline, South Australia. First Quarterly Report for the Period Ending 16 August 1990. Aztec Mining Co. Ltd. In Envelope 8325*).

Detailed mapping and sampling (100 rock-chip, 84 stream sediment, 7 auger soil samples) was completed over Junction Creek /Maldorky (?) Mine - a small abandoned Cu mine with anomalous Au-Ag, Jim's Well Cu Mine (with anomalous Au), Teague's Fork (a previously unknown area of anomalous Au-Ag), Treloar Cu Prospect, and the Dalkey - Mildaltie Cu Mines. Remote sensing Thematic Mapper interpretation identified structural targets (*Greene, F.F., March 1992. Exploration Licence 1657, Nilpena Hill area, Adelaide Geosyncline, South Australia. Final Quarterly Report for the Period Ending 16 August 1991. Aztec Mining Co. Ltd. In Envelope 8325*).

MINERALISATION / PROSPECTS:
Junction Creek/Maldorky (?) Mine, Cu-Au-Ag, open cuts & prospecting pits over a 250m strike length trending 010 - $015^0$, including a single-compartment shaft to 7m depth
Maldorky Gold Anomaly
Teague's Fork, small Cu-Au-Ag prospect, no workings
Clear quartz mined in open cuts near Maldorky Creek
Jim's Well Mine, Cu prospects extend 200m trending $020^0$
Treloar Cu Prospect, costeans worked in early 1980's exposing Cu-bearing fracture
Dalkey - Mildaltie Cu Mines, 5 km west of Radium Hill (Brown 1908)

DRILLING: Nil

| | |
|---|---|
| TENEMENT: | EL 1678 Devenborough Downs |
| COMPANY: | SOUTHERN VENTURES LTD |
| Formerly: | - |
| Followed by: | - |
| AREA: | 686 sq km |
| COMMENCEMENT DATE: | 10.09.90 |
| EXPIRY DATE: | 09.10.91 |
| ENVELOPE: | 8351 Open File |
| DATA PLACED ON OPEN FILE: | October 1991 |
| REFERENCES: | M.I.Q. 63, September 1991, p 9 |
| LOCATION: | Wadnaminga area |
| 1:250 000 SHEET: | OLARY |
| 1:100 000 SHEET: | Anabama 6932, Olary 6933, Mingary 7033 |
| TARGETS: | Au and base metals |
| AGE/ROCK UNITS: | Neoproterozoic Adelaidean metasediments |

EXPLORATION SUMMARY:
Exploration comprised an airborne magnetic and radiometric survey over part of EL 1678, and reprocessing of prior Utah geophysics. Assessment of prior exploration indicated that Wadnaminga Goldfield-style mineralisation is unlikely to produce a large tonnage deposit; base metal potential is also considered to be low.
(*Wills, K.J.A., April 1991. Report for the 6 Months to 9 March 1991, EL 1678 Devenborough Downs, South Australia. Southern Ventures NL. In Envelope 8351*).

MINERALISATION / PROSPECTS: Nil

DRILLING: Nil

| | |
|---|---|
| TENEMENT: | EL 1685 Anabama |
| COMPANY: | NEWMONT AUSTRALIA LTD, |

who merged with BHP Gold Mines Ltd to become NEWCREST MINING LTD

| Formerly: | |
|---|---|
| SML 262, | ASARCO (AUSTRALIA) P/L |
| SML 282, | MINES ADMINISTRATION P/L |
| SML 556, | LONGREACH METALS NL |
| | and MINES ADMINISTRATION P/L |
| EL 753 Anabama Hill, | CSR LTD |

| Followed by: | |
|---|---|
| EL 1782 Anabama, | DOMINION METALS P/L |
| EL 1830 Anabama, | PLACER EXPLORATION LTD |
| EL 2101 Anabama Hill, | G.R. TURNER & J.A. JONES |

| | |
|---|---|
| AREA: | 574 sq km |
| COMMENCEMENT DATE: | 12.11.90 |
| EXPIRY DATE: | 11.11.91 |
| ENVELOPE: | 8348 Open File |
| DATA PLACED ON OPEN FILE: | February 1992 |
| REFERENCES: | M.I.Q. 64, December 1991, p 9 |
| LOCATION: | Anabama Hill region |
| 1:250 000 SHEET: | OLARY |
| 1:100 000 SHEET: | Yunta 6832, Anabama 6932 |
| TARGETS: | Au |
| AGE/ROCK UNITS: | Neoproterozoic Adelaidean Burra and Umberatana Group metasediments, and Anabama granite |

EXPLORATION SUMMARY:
Exploration for gold in Adelaidean metasediments in the Anabama Hill region included reprocessing of prior BP aeromagnetic data, followed by stream sediment BLEG sampling (78 samples and 16 follow-up), rock-chip sampling (44 samples), and soil sampling (24 samples). Stream sediment sampling defined an area of low-level Au/base metal anomalism in the west of EL 1685. Rock-chip sampling returned elevated Cu, Pb, Zn, as in the Mallee Dam Bore / Benda Dam area (*McEwen, G.D., May 1991. Exploration Licence 1685 Anabama. Second Quarterly Report for the Period 12 February 1991 to 11 May 1991. Newcrest Mining Ltd. In Envelope 8348*). Photo-geological interpretation suggested the applicability of a BIF-hosted Starra model for Au - Cu mineralisation.

Follow-up stream sediment and rock-chip sampling downgraded the areas (*McEwen, G.D., December 1991. Exploration Licence 1685 Anabama. Final and Surrender Report for the Period 12 November 1990 to 11 November 1991. Newcrest Mining Ltd. In Envelope 8348*).

MINERALISATION / PROSPECTS: Nil

DRILLING: Nil

| | |
|---|---|
| TENEMENT: | Part EL 1711 Copperlinka |
| COMPANY: | AZTEC MINING CO LTD |
| Joint Venture from February 1993 with | CLIMAX MINING LTD |
| | transferred on 15.04.93 to OXFORD RESOURCES PTY LTD |
| Formerly: | |
| EL 1102 Copperlinka, | UTAH DEVELOPMENT CO |
| EL 1479 Copperlinka, | BHP MINERALS LTD |
| Followed by: | |
| EL 2185 Outalpa, | OXFORD RESOURCES P/L |
| AREA: | 493 sq km, reducing to 104 sq km in March 1993 |
| COMMENCEMENT DATE: | 16.04.91 |
| EXPIRY DATE: | Current |
| ENVELOPE: | Envelope 8444 Confidential |
| | Envelope 8698 Open File (partial relinquishment) |
| DATA PLACED ON OPEN FILE: | June 1993 (Envelope 8698) |
| REFERENCES: | M.I.Q. 70, June 1993, p 17 |
| LOCATION: | Olary area |
| 1:250 000 SHEET: | OLARY |
| 1:100 000 SHEET: | Olary 6933 |
| TARGETS: | Au |
| AGE/ROCK UNITS: | Neoproterozoic Adelaidean Enorama Shale |

EXPLORATION SUMMARY:
Exploration on the relinquished portion consisted of geological reconnaissance and limited rock-chip and stream-sediment geochemical sampling. Anomalous values were recorded near known occurrences. Old underground gold workings at the Kings Bluff line of lode were sampled and described (*Greene, F.F., April 1993. Exploration Licence 1711 Copperlinka Area, Olary Province, South Australia. Relinquishment Report for the Period Ending 15 April 1993. Aztec Mining Co Ltd. In Envelope 8698*)

MINERALISATION / PROSPECTS:
Boomerang Gold Mine
Cooee Gold Mine
Golden Dewdrop (Outalpa) Gold Mine
Unknown (may be Kings Bluff) GPS 431090, 6430115:
- Vertical 2-compartment shaft to 25-30m depth in grey siltstone and pebbly sandstone, with stretched grains and ubiquitous sericitic alteration; white quartz outcrop nearby.
386m to SE, inclined portal towards $280^0$ (what depth?), in bleached and sericitic pebbly sandstone/quartzite dipping $30^0$ west. Second adit 5m above the first is 15m long towards $290^0$, with sheared quartzite-clay-sericite in roof dipping shallowly to the southwest.
- 793m towards $120^0$, inclined adit at $-35^0$ towards $200^0$ following 2m wide densely spaced sheet fracture system, with crushed quartzite, argillic alteration, and minor vein quartz; wallrock is feldspathic kaolinitic and sericitic quartzite; second adit 25m to west is $-30^0$ towards $195^0$, following a densely spaced 1.5m wide fracture zone in massive white quartzite.

Kings Bluff line of lode (includes Kings Bluff Gold Field, Morning Star Gold Mine) GPS 432300, 6429890:
The easternmost of larger inclined adits on Kings Bluff line of lode, in grey quartzite with less argillic and sericitic alteration dips $40^0$ towards south, with a parallel shear zone in floor.
The floor of most workings follows the contact between feldspathic quartzite, and underlying dark grey-green siltstone; the contact is variably sheared. The most favourable Au environment may be where this sheared contact is cut by vertical fractures striking $195^0$ to $200^0$
Summary: Kings Bluff was discovered in 1887 by alluvial prospecting; inclined workings are 8 to 85m deep towards the south. Production totals 967 tonnes of ore treated for 31.570 kg Au bullion. A 20m thick

leached, argillic and sericitic quartzite outcropping at the top of the bluff is underlain by a light grey siltstone, which forms a footwall to the sheared southerly dipping (20-25$^0$) argillic and sericitic auriferous zone; in places there is a pebbly sandstone at the base of the quartzite (*Greene, F.F., April 1993, In Envelope 8698, pp 0027-0031*).

On base map but not mentioned:
Copperlinka Gold Mine
Eringa Cu prospect
Eringa south Cu prospect
Trinkaleena Mine

DRILLING: Nil

| | |
|---|---|
| TENEMENT: | EL 1734 Arkarula |
| COMPANY: | AZTEC MINING CO LTD |
| Formerly: | - |
| Followed by: | |
| EL 1961, Yunta - Mannahill, | EQUINOX RESOURCES NL |
| AREA: | 473 sq km |
| COMMENCEMENT DATE: | 22.07.91 |
| EXPIRY DATE: | 15.12.92 (surrendered) |
| ENVELOPE: | 8556 Open File |
| DATA PLACED ON OPEN FILE: | December 1992 |

REFERENCES:

M.I.Q. 68, December 1992, p 19

Thompson, J.E., 1991. Teetulpa Gold Field: a Regional Overview for Oxford Resources Pty Ltd by Jetrex Exploration Pty Ltd, 24 April 1991. Cited In Envelope 8556.

| | |
|---|---|
| LOCATION: | north of Teetulpa Goldfield, 40 km north of Yunta |
| 1:250 000 SHEET: | OLARY |
| 1:100 000 SHEET: | Winnininnie 6833 |
| TARGETS: | Alluvial gold |
| AGE/ROCK UNITS: | Cainozoic alluvial fans & palaeochannels, draining Neoproterozoic Adelaidean metasediments and intrusive granitoids. |

EXPLORATION SUMMARY:

Exploration for alluvial gold in fans and concealed palaeochannels immediately north of Teetulpa Goldfield included a Thematic Mapper study of satellite data, geochemical sampling (soil and stream sediment), 15 km of ground magnetics on 2 traverses, reconnaissance geological mapping. Mapping identified a broad east-west fan (informally named the 'Four Brothers Fan') north of Teetulpa, derived from Willyama Supergroup granitoid terrain to the north (near Mount Victoria), and deposited over Neoproterozoic Adelaidean metasediments. With uplift to the south along the 'Weekeroo Emergence Axis', later drainage flowing north and northwesterly cuts through this palaeofan extensively eroding it (*Greene, F.F., June 1992. Exploration Licence 1734 Arkarula Area, Olary Province, South Australia. Third Quarterly Report for the Period Ending 21 April 1992. In Envelope 8556*).

MINERALISATION / PROSPECTS:

North of Teetulpa Goldfield

Brady's Gully alluvial Au workings

DRILLING: Nil

| | |
|---|---|
| TENEMENT: | EL 1782 Anabama Hill |
| COMPANY: | DOMINION METALS PTY LTD |
| Formerly: | |
| SML 262, | ASARCO (AUSTRALIA) P/L |

The area of Anabama Hill and Netley Hill were held by SADM as special reserves from relinquishment of SML 262 until 1972

| | |
|---|---|
| SML 282, | MINES ADMINISTRATION LTD |
| SML 556, | LONGREACH METALS NL, |
| | and MINES ADMINISTRATION LTD |
| EL 753 Anabama Hill, | CSR LTD |
| EL 1685 Anabama Hill, | NEWCREST MINING LTD, |
| | and NEWMONT AUSTRALIA LTD |
| Followed by: | |
| EL 2101 Anabama Hill, | G.R. TURNER & J.A. JONES |

| | |
|---|---|
| AREA: | 1135 sq km |
| COMMENCEMENT DATE: | 26.07.92 |
| EXPIRY DATE: | 31.08.94 (surrendered) |
| ENVELOPE: | 8695 Open File |
| DATA PLACED ON OPEN FILE: | December 1994 |
| REFERENCES: | M.I.Q. 76, December 1994, p 11 |

Morris, B.J., 1981. Porphyry-style copper/molybdenum mineralisation at Anabama Hill. *Mineral Resources Review, South Australia*, 150, pp 5-24.

| | |
|---|---|
| LOCATION: | Near Anabama Hill, 40 km southeast of Mannahill |
| 1:250 000 SHEET: | OLARY |
| 1:100 000 SHEET: | Anabama 6932, Olary 6933 |
| TARGETS: | Base metals |
| AGE/ROCK UNITS: | Adelaidean Willouran Boucaut Volcanics, and Burra and Umberatana Group metasediments; Delamerian intrusives (eg Anabama Granite) |

EXPLORATION SUMMARY:
Based on interpretation of reprocessed prior and current aeromagnetic data (jointly with aeromagnetic data for Dominion's adjacent EL 1611 Mutooroo), and on assessment of previous exploration, Dominion concluded that there was good evidence for igneous and structural control of mineralisation, eg of Au and Au-Cu at Wadnaminga along northeast striking structures. Drilling on EL 1611 had indicated low grade epigenetic hydrothermal Cu, Au, Pb and Zn associated with nearby granite intrusion at Maldorky prospect.

In October-November 1992, a program of 58 RAB or RAB/Hammer drillholes totalling 1847m targeted:

- 5 magnetic lows within the Anabama Granite for greisen associated Cu-Mo-Au (drillholes AHRB1-3, GWRB1, 3, 5, GSRB1, 3, 5, GNRB1, 3, 5, & CGRB1, 3, 5), but drilling revealed no anomalous base metal intersections.
- a linear magnetic low at Old Granite Dam (drillholes OGRB1-3, 5-6, 8-11). Holes intersected fluvial and lacustrine sediments over biotite schists and pegmatite, aplite, and tonalite dykes, with sericite and phlogopite alteration associated with minor anomalous Cu and Zn.
- a magnetic low between Turkeys Nest Bore and Anabama Hill (drillholes TNRB1-14). Holes intersected fluvial sediments over micaceous metasediments with phlogopite and chlorite alteration in part, albite alteration in TNRB3, and aplite and tonalite in TNRB5 and TNRB9. Up to 1906 ppm Cu was associated with pyritic and chalcopyritic albitised rock in TNRB3.

- a fault bounded magnetic low striking $025^0$ between 2 granite bodies between Horse Waterhole Dam - Dark Hill Dam (drillholes DHRB1-12 and HWRB1-8). Drilling intersected biotite granite in east (Cornwall Granite), variably altered and mineralised metasediment (dominantly mica schist) with secondary pyrite, manganese oxides, and haematite in the centre, and pyritic greisenised microgranite to the west. The basal 27m in HWRB5 was anomalous, averaging 464 ppm Cu and 606 ppm Zn, associated with epidote, or phlogopite alteration. Anomalous Cu and Zn are associated with haematite / manganese oxide veinlets at 21-36m in DHRB7, and anomalous Zn in siltstone adjacent to amphibolite and aplite dykes in DHRB6.
- Rock-chip sampling (46 samples) northeast of Anabama Hill showed Cu mineralisation to be common near margins of local granitoids:
- up to 2906 ppm Cu in oxidised pyritic quartz veins in muscovite-altered Benda Siltstone(?) at Round Hill
- up to 409 ppm Cu in quartz vein-altered greisenised granodiorite breccia at Hill 2, the easternmost hill of Anabama Granite
- Au up to 6.5 g/t from sulphidic quartz veins in altered adamellite from dumps at old mines at Anabama Hill
- up to 360 ppm tungsten in phlogopite-altered and quartz-veined dolomitic siltstone close to the sheared contact with Anabama Granite near Scott Bore

In general, alteration assemblages and sulphide mineralisation (commonly fine disseminated pyrite) are interpreted as hydrothermal, associated with late-stage leuco-granite intrusion. Muscovite/sericite alteration is pervasive, and potassic (biotite/phlogopite) alteration is common; there is minor albite metasomatism (*Turner, G.R., and Wills, K.J.A., April 1993. Report for the Half Yearly Period Ended 26 January, 1993. Anabama EL 1782, South Australia. Dominion Metals Pty Ltd. In Envelope 8695*)

MINERALISATION / PROSPECTS:
- EL 1782 includes most of the Wadnaminga Goldfield
- Taltabooka Homestead Au prospect
- Welsh Prince Au Mine
- Giles Knob Cu
- Commodore Mine, Au & Pb

ROCK-CHIP ANOMALIES:
- Round Hill
- Hill 2, the easternmost hill of Anabama Granite
- dumps at old mines at Anabama Hill
- near Scott Bore

DRILLING:
October-November 1992: 58 RAB or RAB / Hammer drillholes totalling 1847m at
- Anabama Granite
- Old Granite Dam
- Turkeys Nest Bore - Anabama Hill
- Horse Waterhole Dam - Dark Hill Dam

| | |
|---|---|
| TENEMENT: | EL 1797 Bendigo |
| COMPANY:<br>Joint Venture from March 1993 with | FAIRVIEW GOLD PTY LTD<br>PLACER EXPLORATION LTD |
| Formerly:<br>SML 706,<br>EL 1249 Cottage Bore,<br>EL 1416 Bendigo Station, | <br>STOCKDALE (on ORROROO)<br>CRA EXPLORATION P/L<br>FAIRVIEW GOLD P/L<br>Joint Venture with AZTEC MINING CO LTD<br>Bought by CRACOW RESOURCES LTD |
| Followed by: | - |
| AREA: | 1331 sq km |
| COMMENCEMENT DATE: | 09.11.92 |
| EXPIRY DATE: | 09.11.95 |
| ENVELOPE: | 6931 Open File |
| DATA PLACED ON OPEN FILE: | January 1996 |
| REFERENCES: | *MESA Journal*, Volume 1, March 1996, p 46 |
| LOCATION: | Bendigo area |
| 1:250 000 SHEET: | OLARY, CHOWILLA, ORROROO, BURRA |
| 1:100 000 SHEET: | Caroona 6731, Paratoo 6732, Murkaby 6831, Yunta 6832 |
| TARGETS: | Stratiform / stratabound Au-Cu related to alteration associated with Delamerian granites; & base metals |
| AGE/ROCK UNITS: | Neoproterozoic Adelaidean of the Nackara Arc, Burra Group and Umberatana Group |

EXPLORATION SUMMARY:

Exploration focussed on "Au - Cu mineralisation within structurally prepared hydrothermal sites proximal to oxidised Ordovician granitoids", eg the Bendigo Granite, analogous with "Telfer gold deposit where late Proterozoic granites are interpreted to source gold mineralisation hosted at anticlinal hinges within bedding-slip planes of variably calcareous metasediments".

Exploration commenced with reprocessing of 1979 BHP and 1983 CRA Exploration Pty Ltd aeromagnetic data, from which 35 potential targets were selected; reconnaissance rock sampling (37), petrology, and stream sediment sampling (21) near Mafeking and Bendigo indicated:

- . weakly anomalous Cu in gabbro
- . anomalous Zn and Cu (negligible Au) in an east-northeast trending zone of quartz veining to the south of the gabbro
- . weakly anomalous Zn, Cu, and Ag in ferruginous and siliceous fault zones in pyritic, carbonaceous and silicic shales
- . anomalous Au and Cu in gossanous brecciated and quartz-veined siltstone at Nacua prospect
- . anomalous Cu, Zn, Au in siliceous and haematite-altered brecciated siltstone at Lock Winnoch.
- This was followed by ground magnetics (93 line km) and detailed soil sampling (931 samples) over 10 grids / traverse lines over 20 selected magnetic anomalies, and 13.3 line km of IP at Mafeking East - Wheal Motley - NW Winnoch - Manunda Creek.

- In late 1993, 19 angled RC percussion holes (RC93ME1-14, RC93WM1-5) totalling 1520m were completed at 40m spacing along on 5 traverses at Mafeking East - Wheal Motley, intersecting (graphitic, pyritic, silicic) meta-siltstone, calc-silicates and limestone, and meta-basalt - meta-dolerite, containing weak to minor base metal anomalism, and weak Au anomalism - up to 0.08 ppm (*Anderson, J. (John), December 1994. Bendigo EL 1797 (Fairview Joint Venture) South Australia. First and Second Annual Technical Report for the Period 9th November 1992 to 8th November 1994. Placer Exploration Ltd Report No SA 6/94. In Envelope 6931*).

In late 1994 - 95, 17 RC percussion drillholes totalling 1884m into 9 targets identified from magnetics and geochemistry failed to reveal significant base metals or Au in the Bendigo - Mafeking area:

**NW Winnoch** (RC94NWW1-3), intersected oxidised carbonaceous siltstone/shale and magnetic intermediate intrusive in a fault disrupted fold hinge north of Bendigo Granite; high background Cu level (better than 100 ppm Cu) but with less than 0.04 ppm Au with weak surface enrichment.

**Nacua 17** (RC95NA15), targeted a complex magnetic high along strike to the northeast of Mafeking, and intersected a magnetic mafic intrusive over quartz-rich felsic intrusive, with only minor Cu (340 and 410 ppm) and Au anomalism (best value of 0.05 ppm Au).

**White Line** (RC95WL1-3) targeted 3 north-south linear magnetic anomalies in a major fold hinge, and intersected siltstone/sandstone, with a maximum of 0.05 ppm Au
Manunda Creek (RC94MC1-2) intersected pyritic shale in a fold closure, with no anomalous Au or base metals.

**Wheal Motley** (RC95WM6) targeted a large sigmoidal aeromagnetic anomaly, and intersected weakly magnetic mafic intrusive over felsic intrusive with weakly anomalous Au - up to 0.05 ppm
**Dog Leg West** (RC94DLW1-3), intersected metasediments and siliceous marble (with thin magnetite-bearing interbeds) in a fault disrupted? fold limb north of Bendigo Granite, in contact with a magnetic intermediate - mafic intrusive; best values were 275 and 320 ppm Cu and 0.04 ppm Au in the intrusive, and 0.03 ppm Au in oxidised metasediments
**Nacua** (RC95NA1-3) intersected carbonaceous to siliceous siltstone and fine grained sandstone with rare pyrite and quartz veining; best value was 0.02 ppm Au
**Dalgety's** (RC95DY1) intersected fissile sandstone and siltstone, with only weak near-surface enrichment (0.04 ppm Au, 110 ppm Co)

Further work was recommended to evaluate potential for diamond-bearing kimberlites / lamprophyres; non-diamond-bearing kimberlites are known from Pine Creek, and lamprophyre dykes from Pitcairn Ranges (*Costelloe, J., May 1995. Bendigo EL 1797 (Fairview Joint Venture) South Australia. Third Annual Technical Report for the Period 9th November 1994 to 8th November 1995. Placer Exploration Ltd Report No SA 1/95. In Envelope 6931*)

MINERALISATION / PROSPECTS:

**Mafeking East Zn Prospect**
**Wheal Motley** (Cu)
Nacua prospect Au, Cu
Loch Winnoch prospect (on BURRA 1:250 000 map sheet)

DRILLING:

late 1993: Mafeking East - Wheal Motley:
19 angled RC holes (RC93ME1-14, RC93WM1-5), totalling 1520m

late 1994 - 95: 17 RC percussion drillholes (RC94NWW1-3, RC94MC1-2, RC94DLW1-3, RC95NA15, RC95WL1-3, RC95WM6, RC95NA1-3, RC95DY1), totalling 1884m, in the Bendigo - Mafeking area

| | |
|---|---|
| TENEMENT: | EL 1799 Melton |
| COMPANY: | CRA EXPLORATION PTY LTD |
| Formerly: | - |
| Followed by: | - |
| AREA: | 1845 sq km |
| COMMENCEMENT DATE: | 20.11.92 |
| EXPIRY DATE: | 23.08.93 (surrendered) |
| ENVELOPE: | 8723 Open File |
| DATA PLACED ON OPEN FILE: | March 1994 |
| REFERENCES: | M.I.Q. 73, March 1994, p 15 |
| LOCATION: | Melton area, 20 km northwest of Yunta; on extreme western edge of OLARY map sheet. |
| 1:250 000 SHEET: | ORROROO, OLARY |
| 1:100 000 SHEET: | Paratoo 6732, Koonamore 6733, Yunta 6832, Winnininnie 6833 |
| TARGETS: | Diamonds, base metals, precious metals |
| AGE/ROCK UNITS: | Mesoproterozoic kimberlitic lamprophyres in Neoproterozoic Adelaidean metasediments |

EXPLORATION SUMMARY:

97 minus 2 mm gravel and minus 80 mesh samples were collected in a regional helicopter-supported sampling program.

Heavy mineral analysis of the gravel samples reported:
- chromite
- chromite plus magnesian ilmenite
- magnesian ilmenite
- chromite plus pyrope garnet

but none appeared to be of kimberlitic origin.

A 0.13 ppm Au assay was recorded in a catchment area containing the Waukaringa Gold Mine (enclosed by, but not part of EL 1799; on ORROROO 1:250 000 map sheet), against a background level of less than 0.01 ppm Au; sample density was insufficient to definitively test the EL area (*Hughes, A.R., September 1993. Final Report for Melton EL 1799, South Australia. CRA Exploration Pty Ltd, Report No 19233. In Envelope 8723*).

MINERALISATION / PROSPECTS:
Waukaringa Gold Mine (enclosed by, but not part of EL 1799; on ORROROO 1:250 000 map sheet)

DRILLING: Nil

| | |
|---|---|
| TENEMENT: | EL 1838 Lilydale |
| COMPANY: | DOMINION GOLD OPERATIONS PTY LTD |
| Formerly: | |
| EL 16 Anabama, | SADM |
| EL 173 Anabama Hill, | SADM |
| EL 312, 508, 937, Cronje Dam, | CARPENTARIA EXPLORATION CO P/L |
| EL 1234 Round Hill, | UTAH DEVELOPMENT CO LTD |
| EL 1285 Cronje Dam, | THE SHELL CO OF AUSTRALIA LTD |
| EL 1462 Lilydale, | CSR LTD, then PLACER EXPLORATION LTD |
| Followed by: | |
| EL 2101 Anabama Hill | G.R. TURNER & J.A. JONES |
| AREA: | 487 sq km |
| COMMENCEMENT DATE: | 12.07.93 |
| EXPIRY DATE: | 11.07.94 |
| ENVELOPE: | No Envelope |
| DATA PLACED ON OPEN FILE: | No data |
| REFERENCES: | - |
| LOCATION: | Lilydale Station, 50 km southeast of Yunta |
| 1:250 000 SHEET: | OLARY |
| 1:100 000 SHEET: | Yunta 6832, Anabama 6932 |
| TARGETS: | base and precious metals |
| AGE/ROCK UNITS: | Neoproterozoic Adelaidean metasediments? |
| EXPLORATION SUMMARY: | No work completed |
| MINERALISATION / PROSPECTS: | Nil |
| DRILLING: | Nil |

| | |
|---|---|
| TENEMENT: | EL 1961 Yunta - Manna Hill |
| COMPANY: | EQUINOX RESOURCES NL |
| Formerly: | |
| SML 479 Mannahill, | ELVIRE P/L |
| SML 484 Winnininnie, | S.A. BARYTES |
| SML 488 Mount Victor, | PROPERTY & MINERALS EXPLORATION LTD |
| SML 635 Mannahill, | ELVIRE P/L |
| (SML 470 to 635 not reported in Yates, 1992) | |
| EL 363, Mannahill Goldfield, | NEWMONT P/L |
| EL 584 Mount Victor, | CRA EXPLORATION P/L |
| EL 1161 Mannahill Goldfield, | JARMAND MINERALS & EXPLORATION P/L |
| EL 1164 Mannahill, | AMAX AUSTRALIA (GOLD) P/L |
| EL 1322 Teetulpa, | WESTERN MINING CORPORATION LTD |
| EL 1334 Wattle Dam, | WESTERN MINING CORPORATION LTD |
| EL 1346 Mannahill, | WESTERN MINING CORPORATION LTD |
| EL 1376 Hope Bank, | CRA EXPLORATION P/L |
| EL 1436 Mannahill, | HALLMARK GOLD NL |
| EL 1734 Arkarula, | AZTEC MINING CO. LTD |
| Followed by: | - |
| AREA: | 2147 sq km |
| COMMENCEMENT DATE: | 27.07.94 |
| EXPIRY DATE: | 26.07.95 |
| ENVELOPE: | 8970 Open File |
| DATA PLACED ON OPEN FILE: | January 1996 |
| REFERENCES: | |

*MESA Journal*, Vol 1, March 1996, p 46

Parker, A.J., 1995. Mannahill EL, Nackara Arc, Adelaide Geosyncline, South Australia, Review of Previous Exploration. Equinox Resources NL. In: Tomich, C.S., September 1995, In Envelope 8970.

McIntyre, J., and Tomich, C.S., 1995. Previous Exploration in the Red Hill - Waukaringa region. Adelaide Fold Belt, South Australia. Equinox Resources NL. In: Tomich, C.S., September 1995, In Envelope 8970

| | |
|---|---|
| LOCATION: | Yunta - Mannahill - Waukaringa region |
| 1:250 000 SHEET: | OLARY and ORROROO |
| 1:100 000 SHEET: | Winnininnie 6833, Yunta 6832; Koonamore 6733, Paratoo 6732 |
| TARGETS: | Telfer-style Au |
| AGE/ROCK UNITS: | Neoproterozoic Adelaidean metasediments of the Nackara Arc |

EXPLORATION SUMMARY:

Exploration comprised mapping, rock-chip sampling and BLEG stream-sediment sampling. Potential structures were not readily distinguishable on aeromagnetic data and mineralisation is likely to be small scale.

The exploration model was based on the Telfer region of WA, where structurally controlled Au mineralisation, related to intrusion of younger granites, is within host rocks comparable to the Nackara Arc. Equinox identified significant structural features in the Nackara Arc including regional low-angle thrust faults, listric thrust ramps, steep reverse faults and strike-slip faults.

Exploration commenced with an extensive review of known mines and mineralisation (*Parker, A.J., 1995. Mannahill EL, Nackara Arc, Adelaide Geosyncline, South Australia, Review of Previous Exploration. Equinox Resources NL. In: Tomich, C.S., September 1995, In Envelope 8970*), and a review of previous exploration by Battle Mountain and CRA in the Red Hill - Waukaringa area (*McIntyre, J., and Tomich, C.S., 1995. Previous Exploration in the Red Hill - Waukaringa region. Adelaide Fold Belt, South Australia. Equinox Resources NL. In: Tomich, C.S., September 1995, In Envelope 8970*). This was followed by mapping, 51 rock-chip samples and 26 stream sediment BLEG samples. Interpretation of aeromagnetics indicated great structurally complexity, interpreted as typical of a thin skinned thrust-fold terrane, and controls on known Cu and/or Au deposits (associated with narrow quartz-sulphide gossan with locally restricted structural controls) are not readily distinguishable on aeromagnetics. Known sites "have limited tonnage potential and offer no encouragement or pointers for locating large scale buried / blind deposits" (*Tomich, C.S., September 1995. Manna Hill EL 1961 and Red Hill EL 1962 Adelaide Fold Belt. Final Report for the 6 Months Ending 26th July 1995. Equinox Resources NL. In Envelope 8970*).

MINERALISATION / PROSPECTS:

Winnininnie Barytes
Manna Hill Goldfield (excluded from EL 1961)
Teetulpa Goldfield (excluded from EL 1961)
Nillinghoo Goldfield (excluded from EL 1961)

DRILLING: Nil

| | |
|---|---|
| TENEMENT: | EL 2101 Anabama Hill |
| COMPANY: | G.R. TURNER AND J.A. JONES |
| Formerly: | |
| SML 262, | ASARCO (AUSTRALIA) P/L |
| SML 282, | MINES ADMINISTRATION P/L |
| SML 556, | LONGREACH METALS NL, and MINES ADMINISTRATION P/L |
| EL 753 Anabama Hill, | CSR LTD |
| EL 1685 Anabama, | NEWCREST MINING LTD, and NEWMONT AUSTRALIA LTD |
| EL 1782 Anabama, | DOMINION METALS P/L |
| Followed by: | - |
| AREA: | 182 sq km |
| COMMENCEMENT DATE: | 29.08.95 |
| EXPIRY DATE: | 28.08.96 |
| ENVELOPE: | 9107 Open File |
| DATA PLACED ON OPEN FILE: | March 1997 |
| REFERENCES: | *MESA Journal*, Volume 5, 1997 (pending) |
| LOCATION: | Anabama Hill |
| 1:250 000 SHEET: | OLARY |
| 1:100 000 SHEET: | Anabama 6932 |
| TARGETS: | Au |
| AGE/ROCK UNITS: | Neoproterozoic Adelaidean metasediments, and Cambro-Ordovician Delamerian Anabama Granite |

EXPLORATION SUMMARY:

Exploration comprised a detailed re-interpretation of aeromagnetic data, emphasising structural features within the Anabama Granite and in surrounding Adelaidean metasediments. Geological reconnaissance confirmed strong sodic (phlogopite) and potassic (biotite) alteration zone extending a few kilometres from the Anabama Granite, being more extensive along crush or fault zones, eg at the Welsh Prince Mine, northwest of Anabama Hill, within Benda Siltstone (*Turner, G., October 1996. Geological Investigations on Exploration Licence 2101 - Wadnaminga, South Australia, Final Report. In Envelope 9107*)

MINERALISATION / PROSPECTS: Nil

Welsh Prince Au Mine (6 km south of Wadnaminga Goldfield in Mintaro Shale, Burra Group)

DRILLING: Nil

139°30' 140° 140°30' 141°

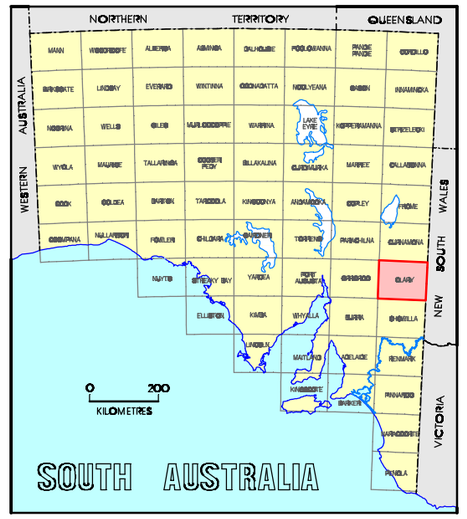
32°

32°30'

33°

584/939
1164
1098/1226
942
363
1161
925
530
1164
1102
1163
753
312/508/937

MOUNT VICTOR
'Mt Victor'
ETHIUDNA HILL
MINDAMEREEKA HILL
'Plumbago'
PIMPENA HILL
MOOLEUGORE HILL
BIMBOWRIE HILL
'Bimbowrie'
BINBERRIE HILL
'Old Beolcoomata'
'Old Lake Dismal'
'Wompinie'
Cockburn
AMEROO HILL
OUTALPA HILL
'Bulloo Creek'
Mingary
'Tepco'
'Pine Creek'
'Four Brothers'
BEWOOLOO HILL
YERKA HILL
'Outalpa'
MACDONALD HILL
Cutana
'Cutana'
PINERY HILL
WEEKEROO HILL
'Morialpa'
'Bonnie Brae'
KING BLUFF
Olary
'Weekeroo'
'Wiawera'
'Aroona'
Corella'
'Eringa Park'
QUARTZ HILL
'Ballara'
YARDLOWIE HILL
ALTANDEE HILL
'Karolta'
'Wawirra'
Manna Hill
DEY HILL
MALDORKY HILL
'Devonborough Downs'
PEAKED HILL
'Mutooroo'
'Duffields'
'Winninninnie'
MT EDWARDS
'Wadnaminga'
'Taltabooka'
'Teetulpa'
TATTAWURPA HILL
Winninninnie
'Oulnina'
LION HILL
GOODE HILL
GILES NOB
COCKSCOMB HILL
'Oulnina Park'
Yunta
OULNINA HILL
ROUND HILL
ONE TREE HILL
DARE HILL
WHARTON HILL
'Dlorah Downs'
ANABAMA HILL
BATLEY HILL
'Tiverton'
'Netley Gap'
GRAMPUS HILL
SCOBIE HILL
'Anabama East Hut'
'Manunda'
'Oak Park'
ORATAN ROCK
'Tiverton Outstation'
'Old Manunda'
IRON PEAK
'Lilydale'
'Oakvale'




0 5 10 15 20 25
KILOMETRES

Figure.....1

OLARY 1:250 000 MAP SHEET

# ELs 312-1226
## (Yunta, Winninninnie, Anabama and Oakvale Area)

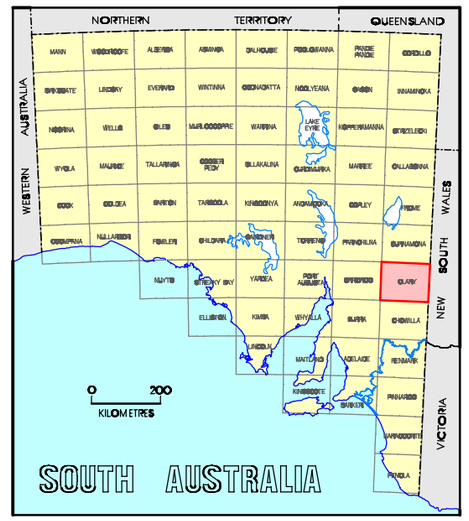
MINES and ENERGY RESOURCES SOUTH AUSTRALIA

QD6 100890.DTA

97-0804 MESA

139°30'
140°
140°30'
141°
32°
32°30'
33°

PIMPENA HILL
MOOLEUGORE HILL
ETHIUDNA HILL
BIMBOWRIE HILL
MINDAMEREEKA HILL
MOUNT VICTOR
'Mt Victor'
'Plumbago'
'Bimbowrie'
BINBERRIE HILL
'Old Beolcoomata'
'Wompinie'
'Old Lake Dismal'
Cockburn
AMEROO HILL
OUTALPA HILL
'Bulloo Creek'
Mingary
'Tepco'
'Pine Creek'
'Four Brothers'
BEWOOLOO HILL
YERKA HILL
'Outalpa'
MACDONALD HILL
Cutana
'Cutana'
PINERY HILL
1322
WEEKEROO HILL
KING BLUFF
'Aroona'
'Corella'
'Bonnie Brae'
'Monalpa'
Olary
'Wiawera'
'Weekeroo'
QUARTZ HILL
1376
'Ballara'
'Eringa Park'
1346
1334
DEY HILL
YARDLOWIE HILL
'Karolta'
ALTANDEE HILL
Manna Hill
'Wawirra'
MALDORKY HILL
'Mutooroo'
'Devonborough Downs'
PEAKED HILL
'Winninninnie'
MT EDWARDS
'Wadnaminga'
'Duffields'
TATTAWUPPA HILL
Winninninnie
'Oulnina'
'Taltabooka'
LION HILL
'Teetulpa'
COCKSCOMB HILL
GILES NOB
GOODE HILL
'Oulnina Park'
Yunta
OULNINA HILL
ROUND HILL
ONE TREE HILL
1250
1234
DARE HILL
WHARTON HILL
1268/1335
'Dloran Downs'
ANABAMA HILL
BATLEY HILL
'Tiverton'
'Netley Gap'
GRAMPUS HILL
'Anabama East Hut'
SCOBIE HILL
1285
'Manunda'
'Oak Park'
1249
1311
ORATAN ROCK
1279
'Tiverton Outstation'
Old Manunda
1321
IRON PEAK
'Lilydale'
1229
1321
'Oakvale'




0 5 10 15 20 25
KILOMETRES

Figure.....2

OLARY 1:250 000 MAP SHEET

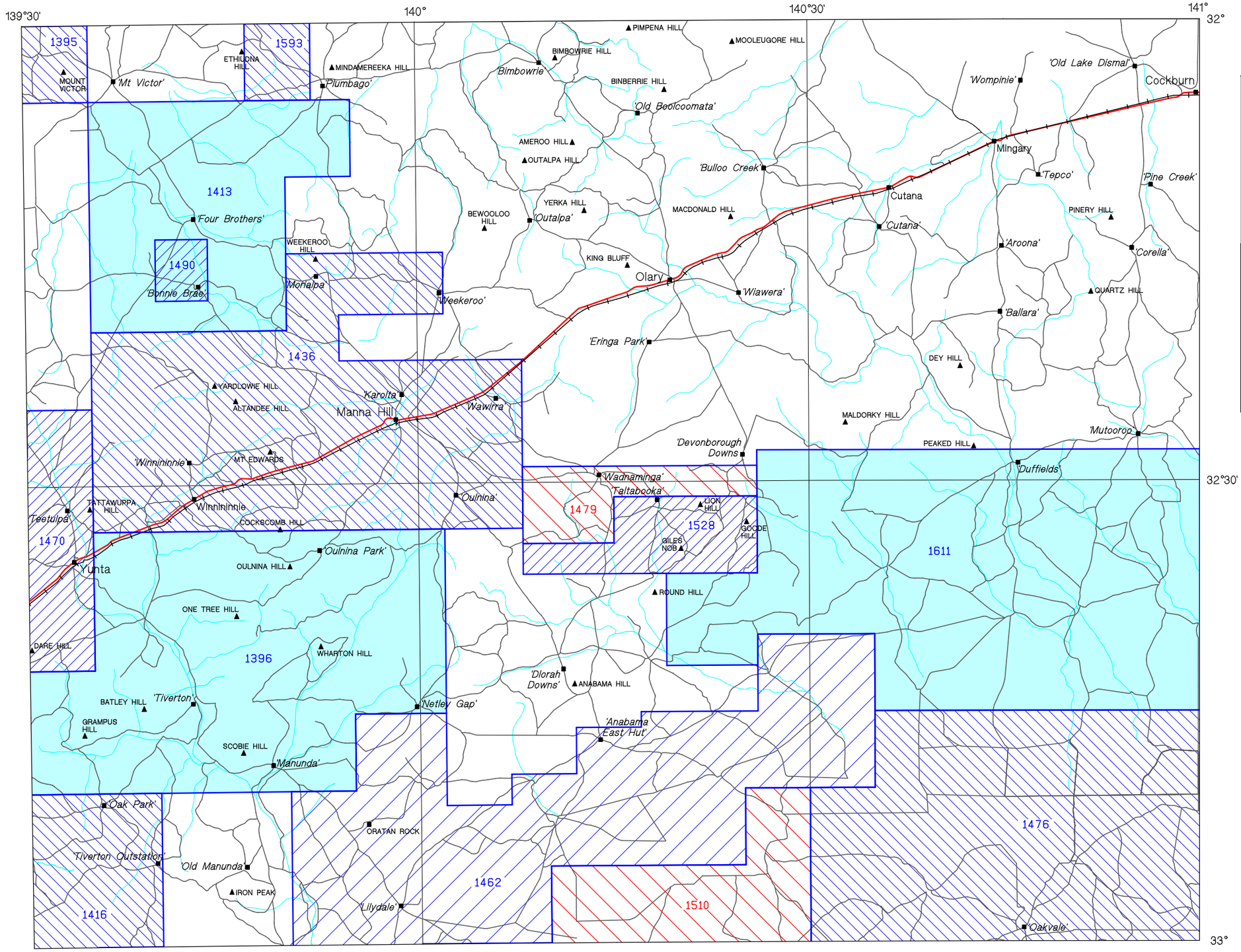
# ELs 1229-1376

## (Yunta, Winninninnie, Anabama and Oakvale Area)

MINES and ENERGY RESOURCES SOUTH AUSTRALIA

QD6 100890.DTA

97-0805 MESA



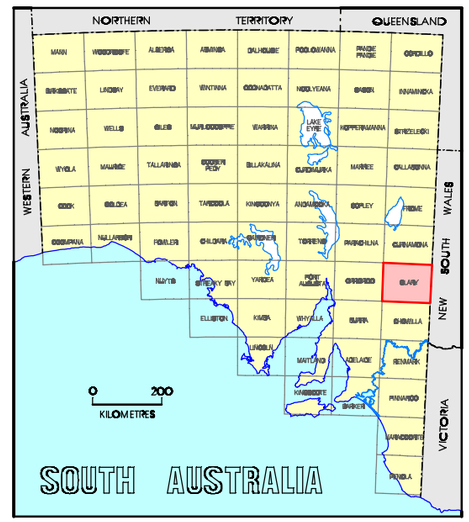




Figure.....3

OLARY 1:250 000 MAP SHEET

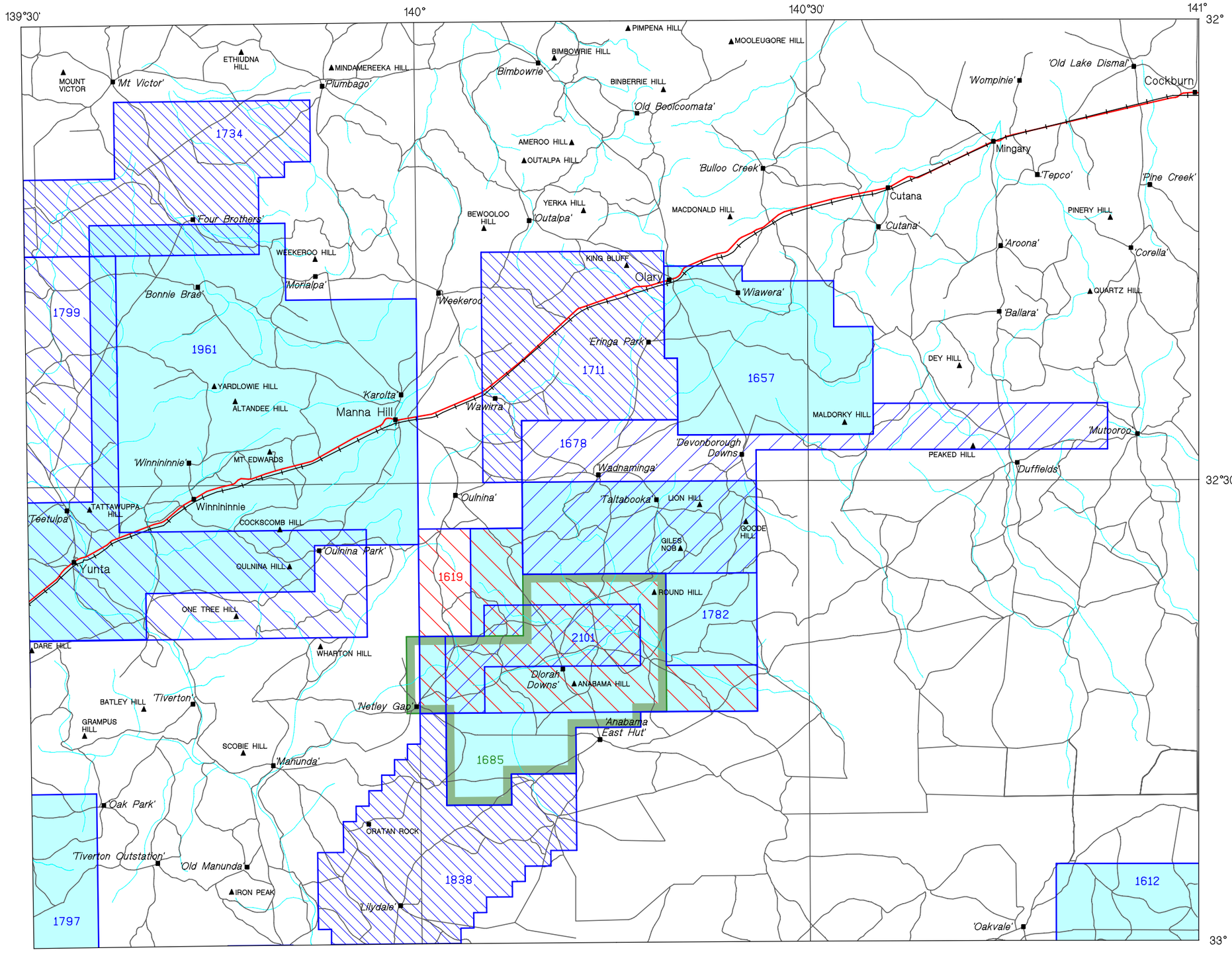
# ELs 1395-1611

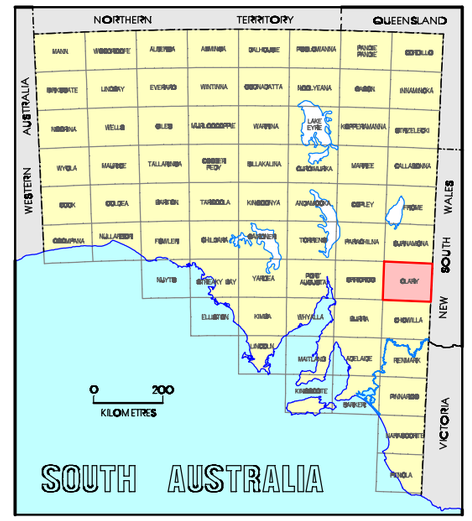
## (Yunta, Winninninnie, Anabama and Oakvale Area)

MINES and ENERGY RESOURCES SOUTH AUSTRALIA

QD6 100890.DTA

97-0806 MESA




0 5 10 15 20 25
KILOMETRES

Figure.....4

OLARY 1:250 000 MAP SHEET

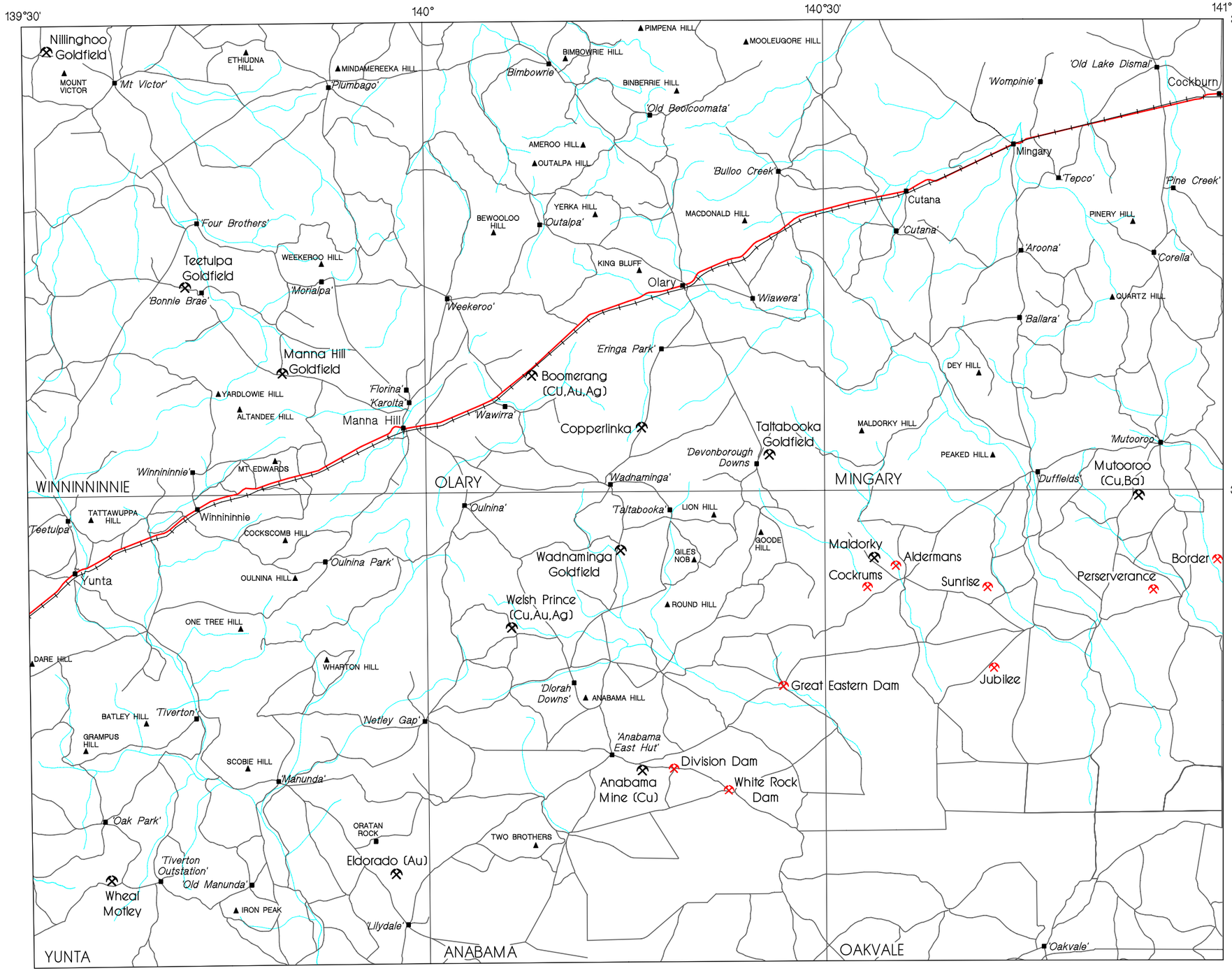
# ELs 1612-2101

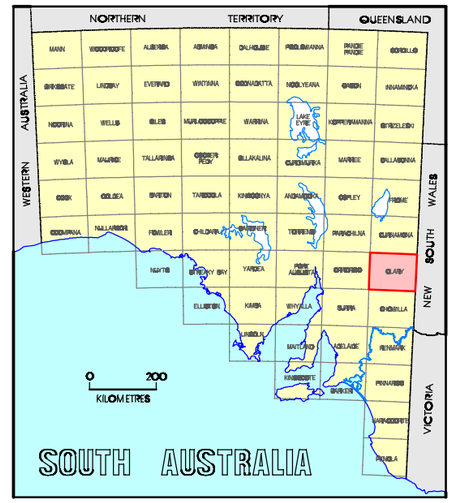
## (Yunta, Winninninnie, Anabama and Oakvale Area)

MINES and ENERGY RESOURCES SOUTH AUSTRALIA

QD6 100890.DTA

97-0807 MESA




## LEGEND

- Named anomaly/prospect
- Old mine/prospect

Figure.....5

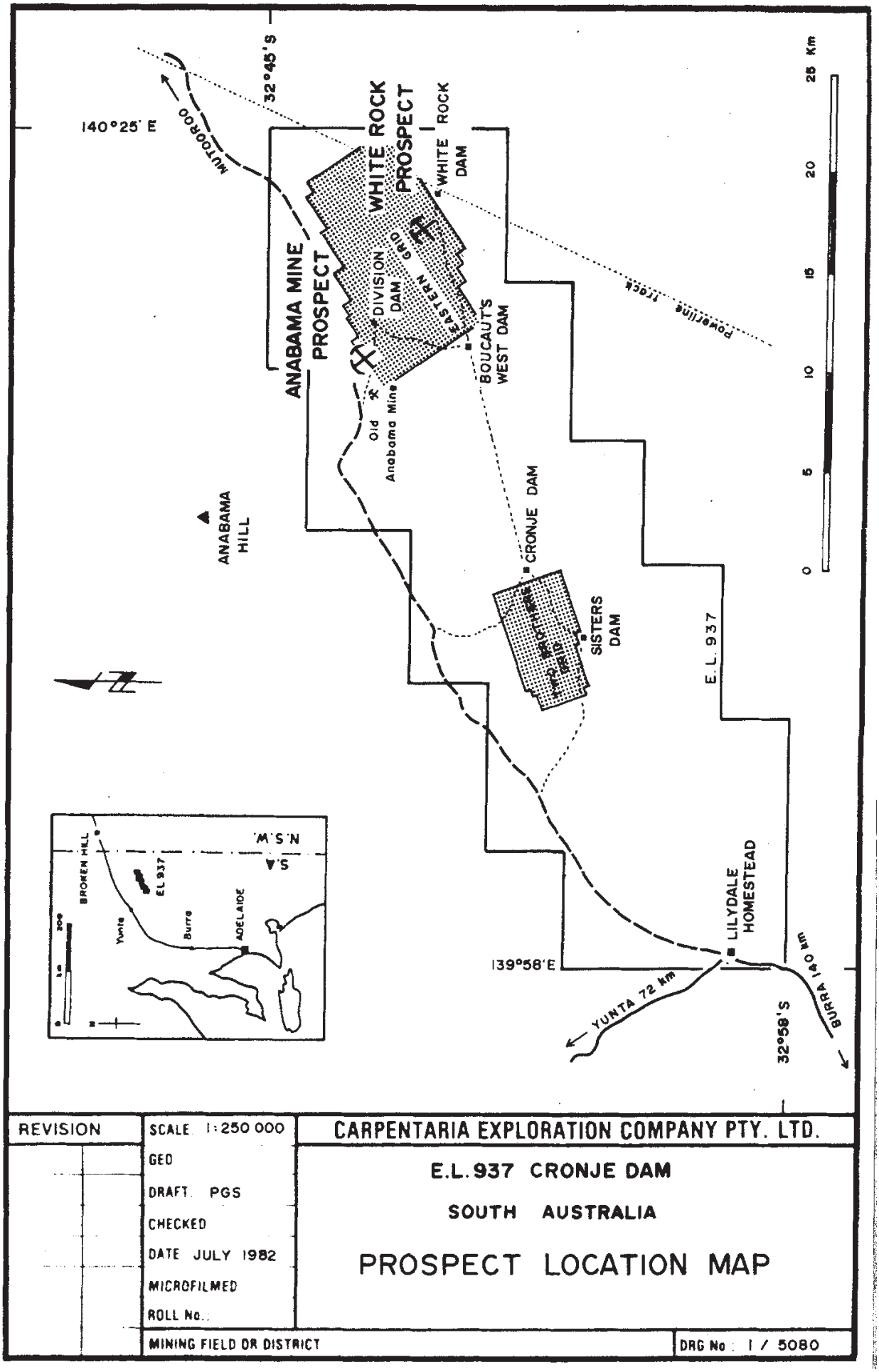
OLARY 1:250 000 MAP SHEET

**(Yunta, Winnininnie, Anabama and Oakvale Area)**

97-1060 MESA

MINES and ENERGY RESOURCES SOUTH AUSTRALIA

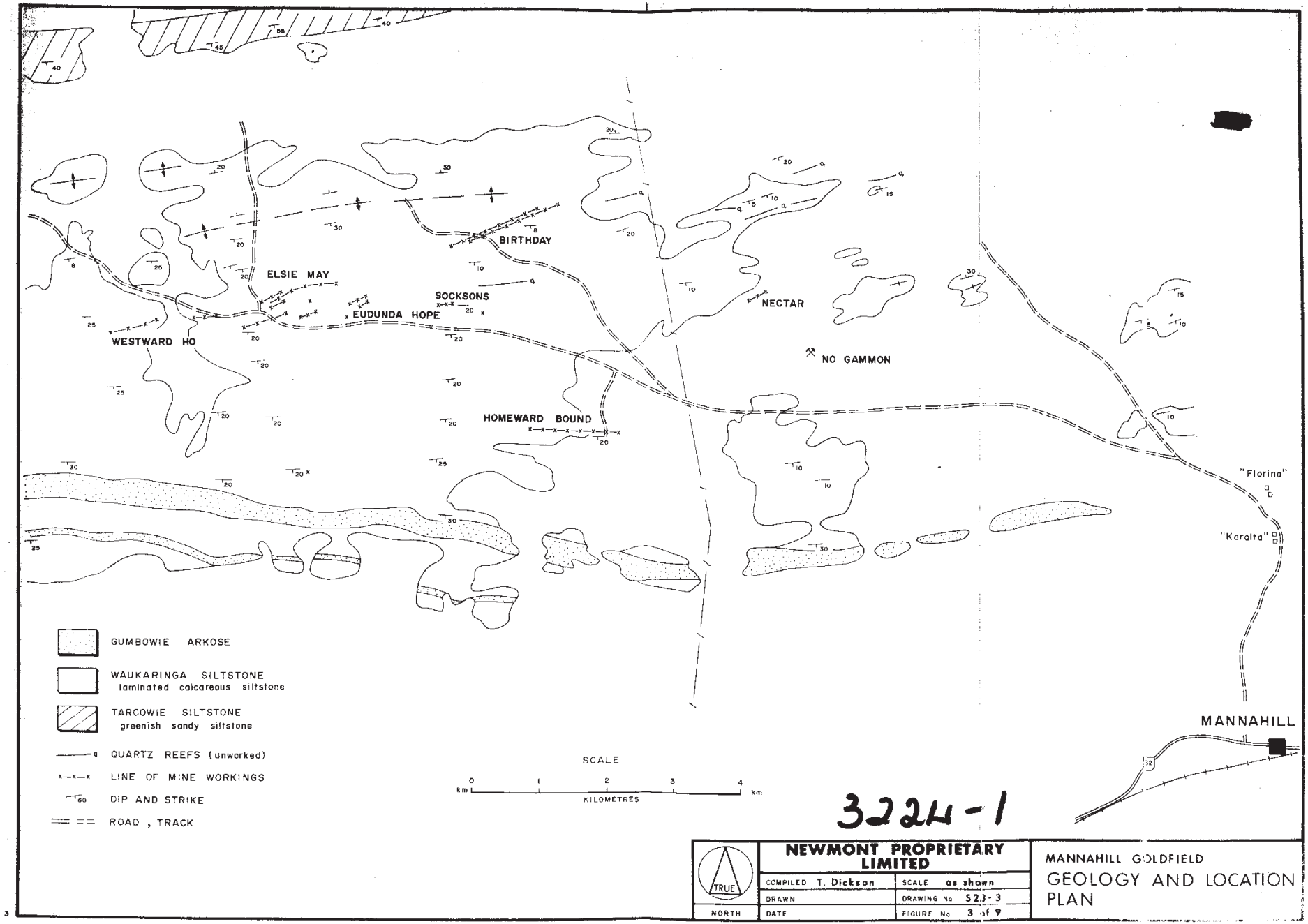
QD6 100890.DTA




| REVISION | SCALE 1:250 000 | CARPENTARIA EXPLORATION COMPANY PTY. LTD. |
|---|---|---|
| | GEO | E.L. 937 CRONJE DAM |
| | DRAFT PGS | SOUTH AUSTRALIA |
| | CHECKED | PROSPECT LOCATION MAP |
| | DATE JULY 1982 | |
| | MICROFILMED | |
| | ROLL No.: | |
| | MINING FIELD OR DISTRICT | DRG No : 1 / 5080 |

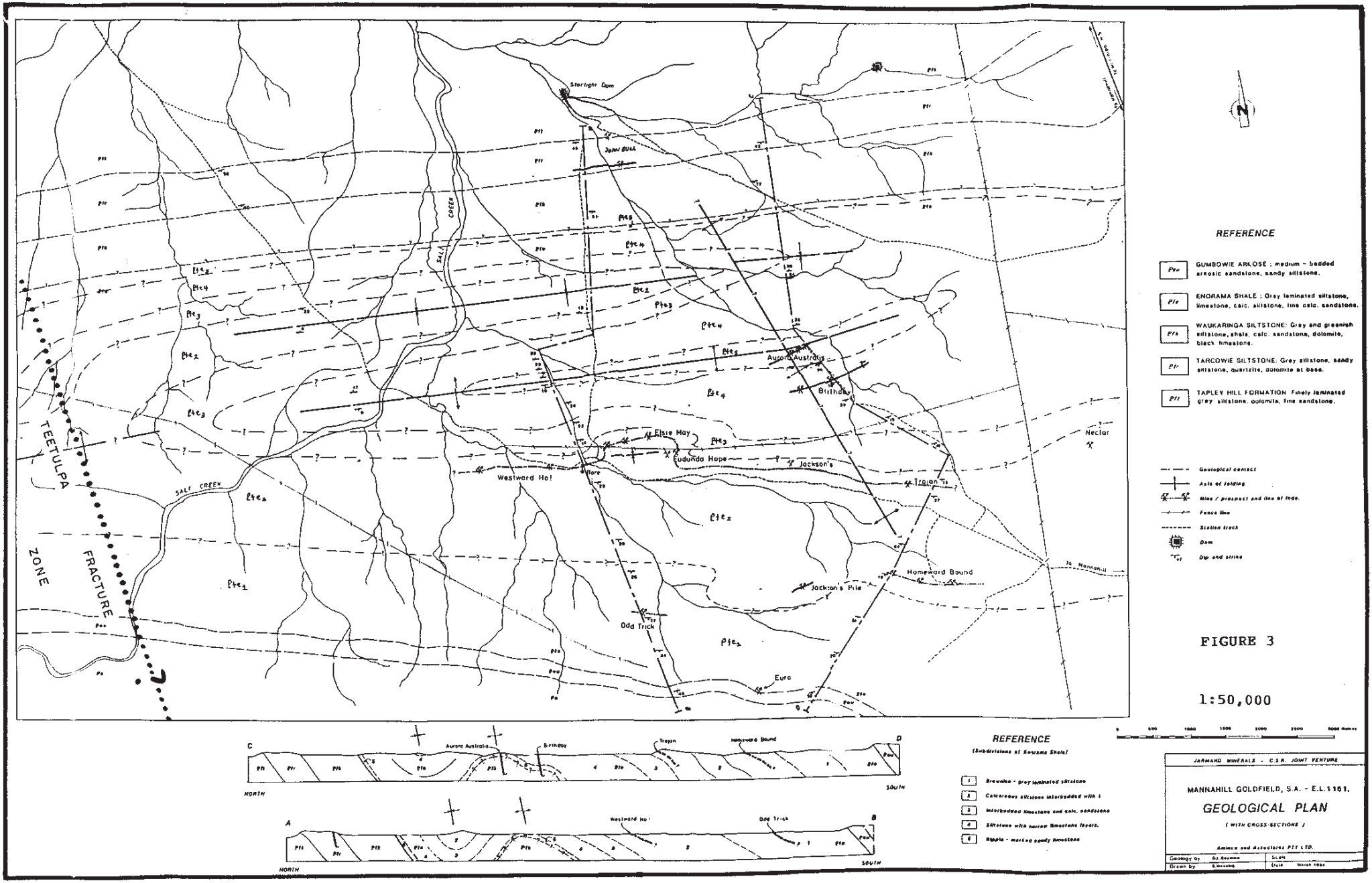
# EL 312,508,937
# LOCATION OF GRIDS AND PROSPECTS

Figure.....6



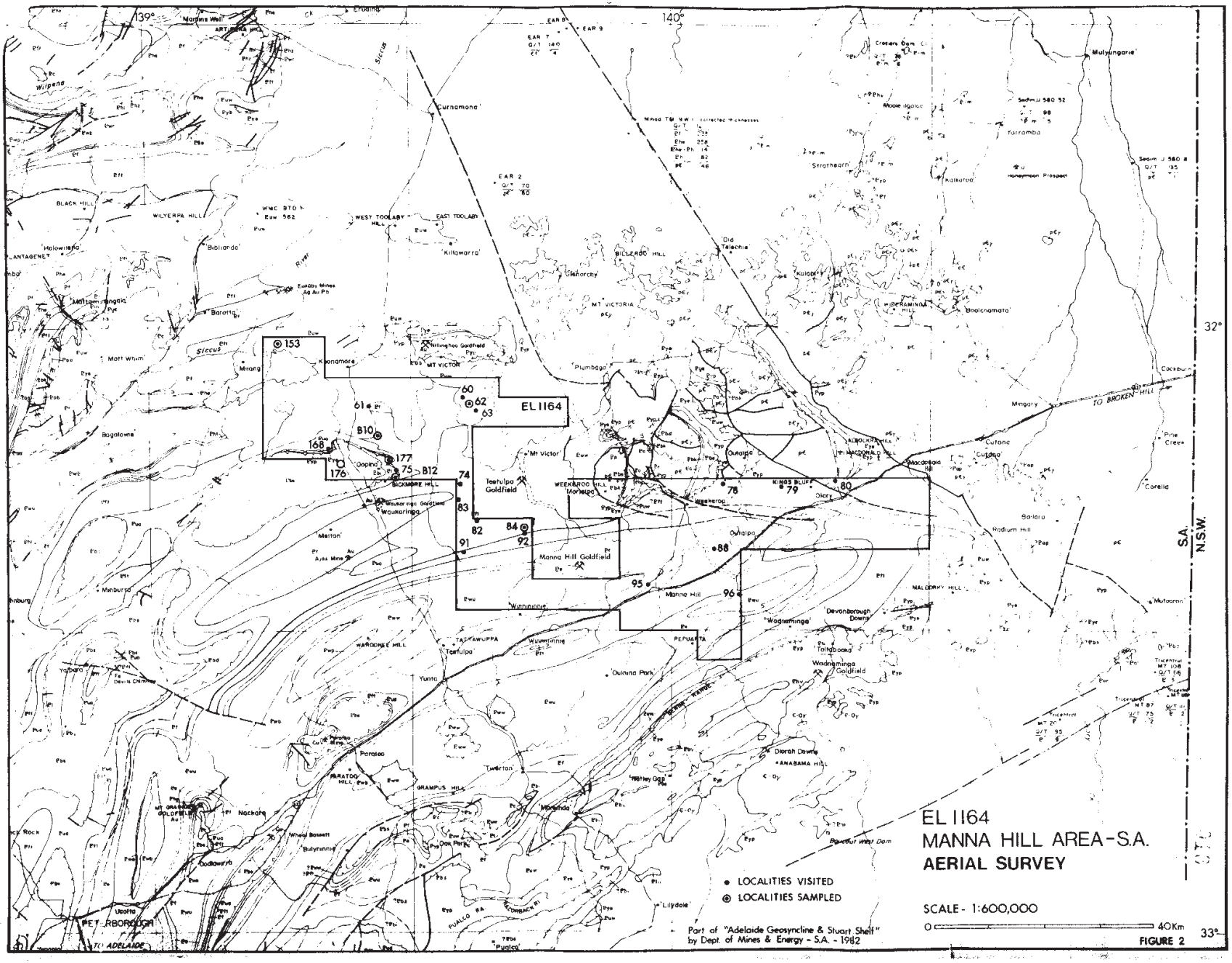

# EL's 363
# GEOLOGY AND LOCATION OF MINES AND PROSPECTS

Figure.....7




# EL 1161
# GEOLOGICAL INTERPRETATION

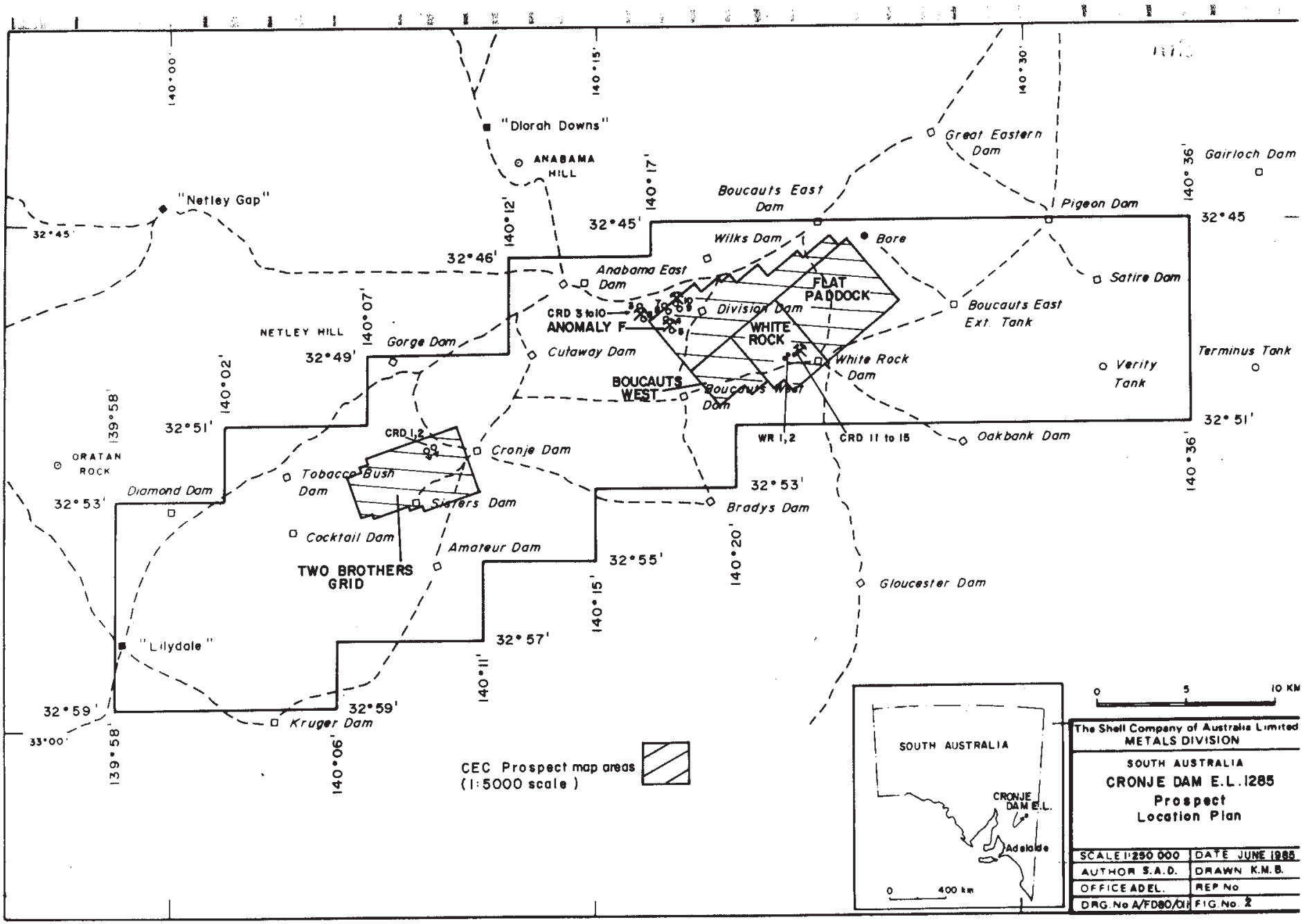
Figure.....8




# EL 1161
# SAMPLE LOCATION AND GEOLOGICAL SETTING

Figure.....9

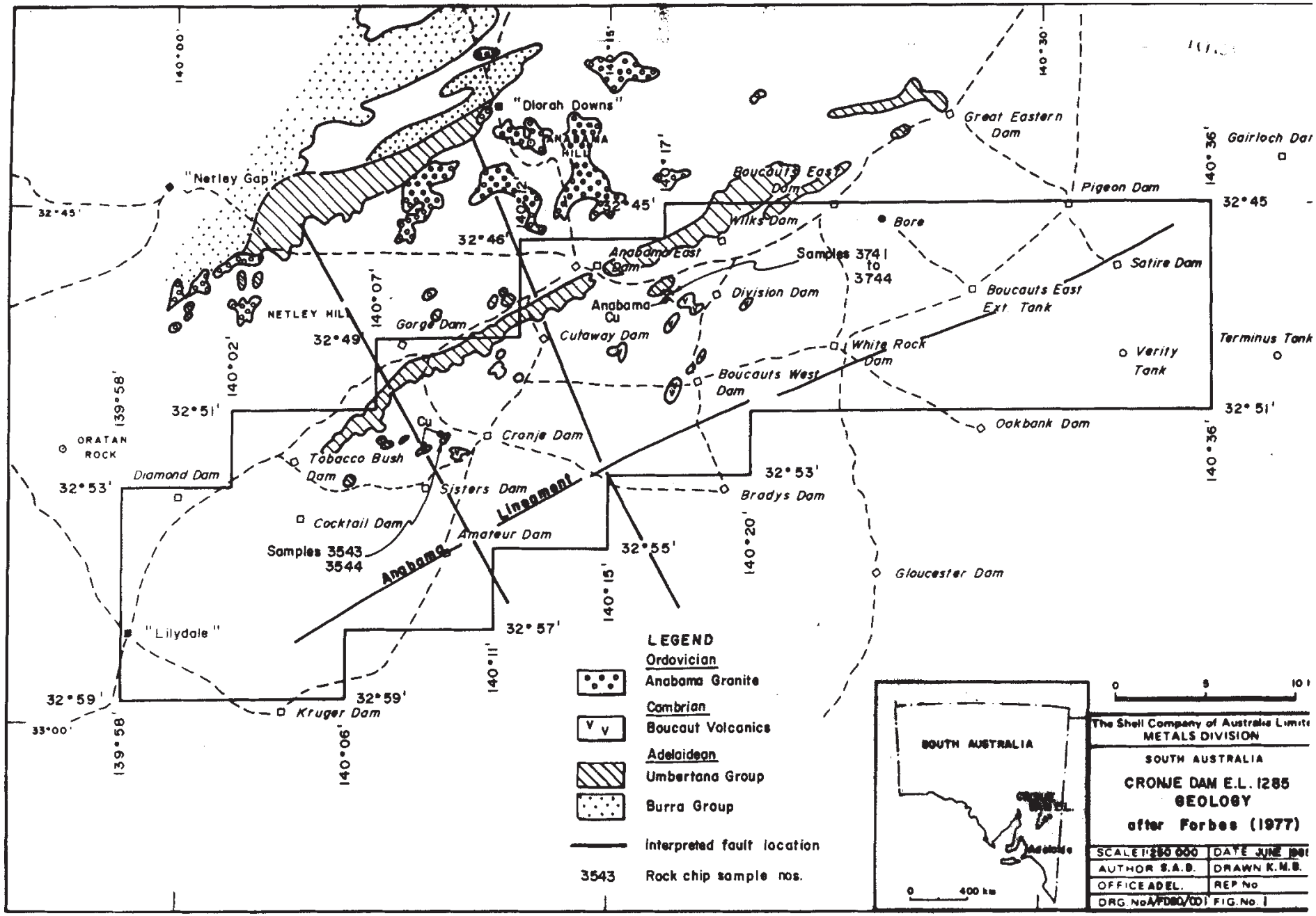
97-1136 MESA




# EL's 1285
# EXPLORATION GRID AND PROSPECT LOCATIONS

Figure.....10

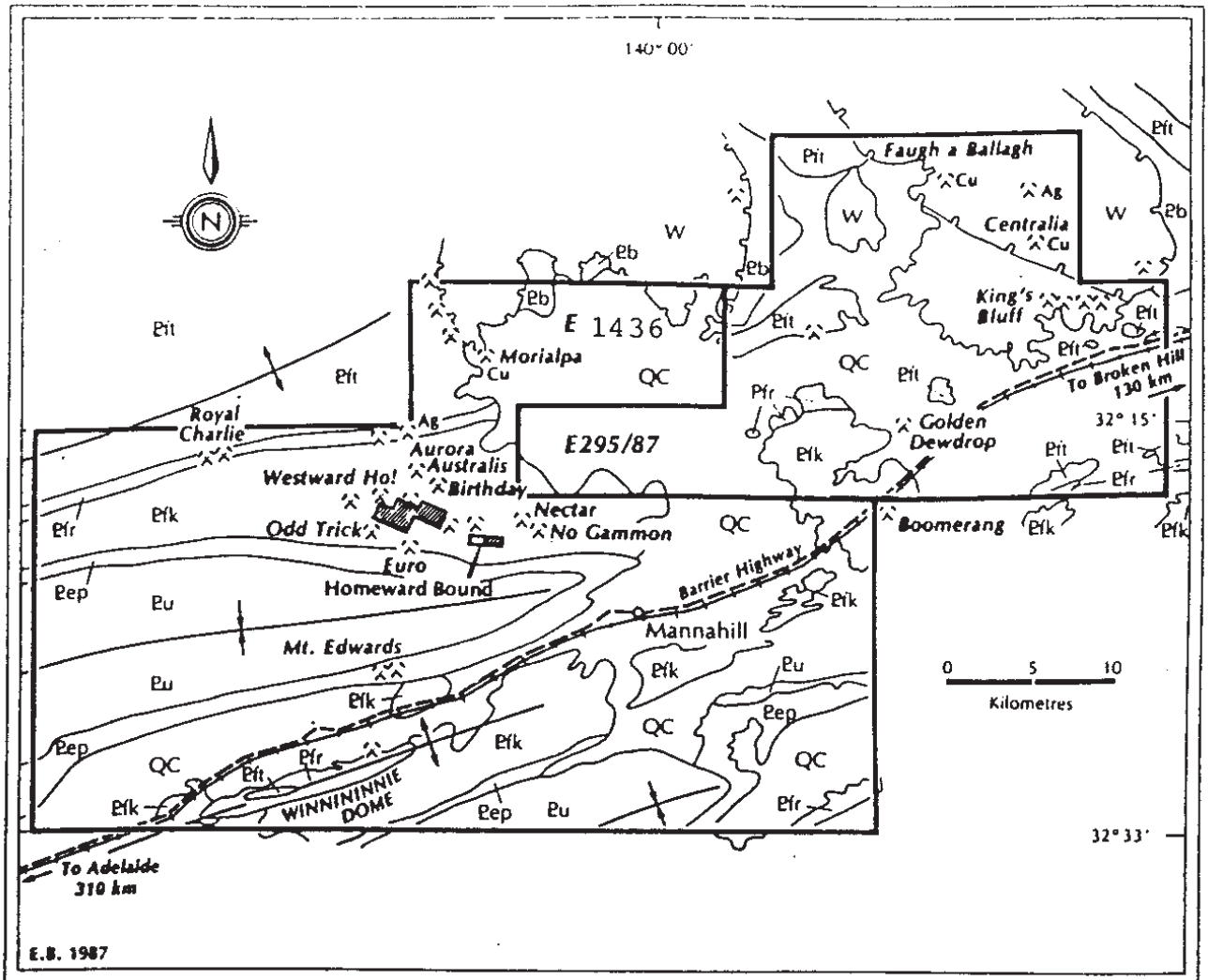
97-1137 MESA

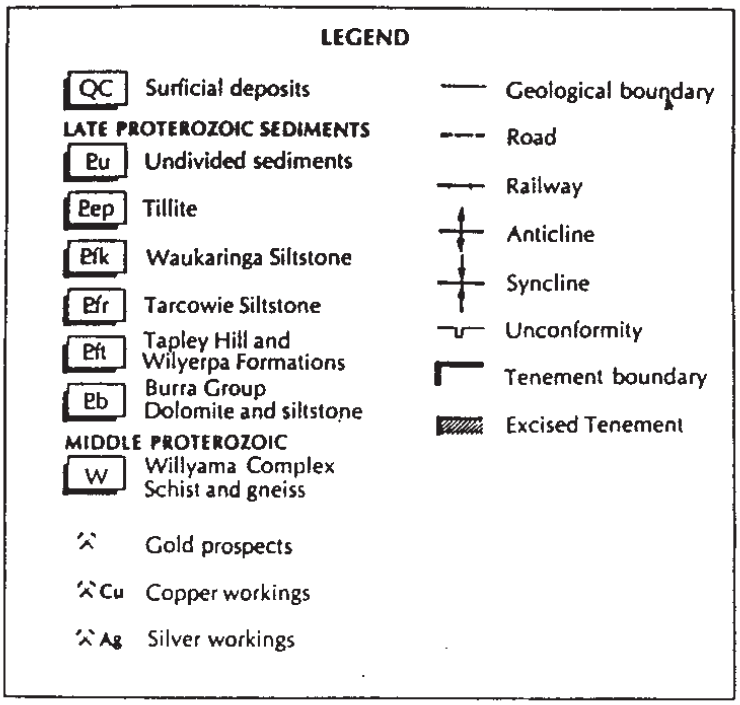


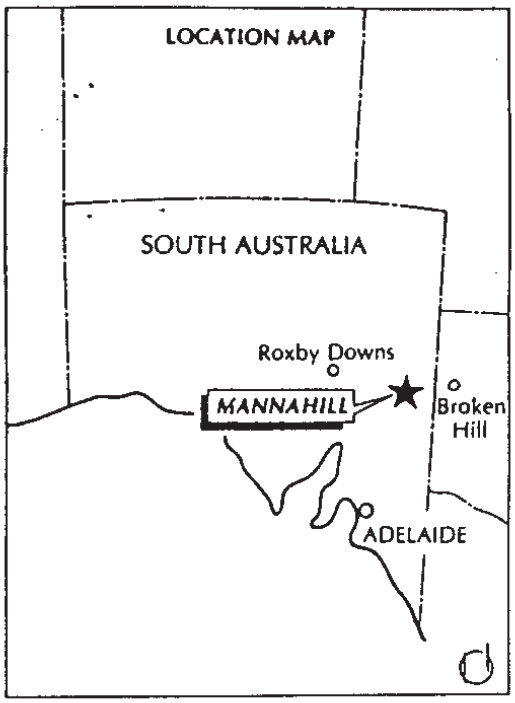

# EL's 1285
# GEOLOGICAL SETTING

Figure.....11

97-1138 MESA



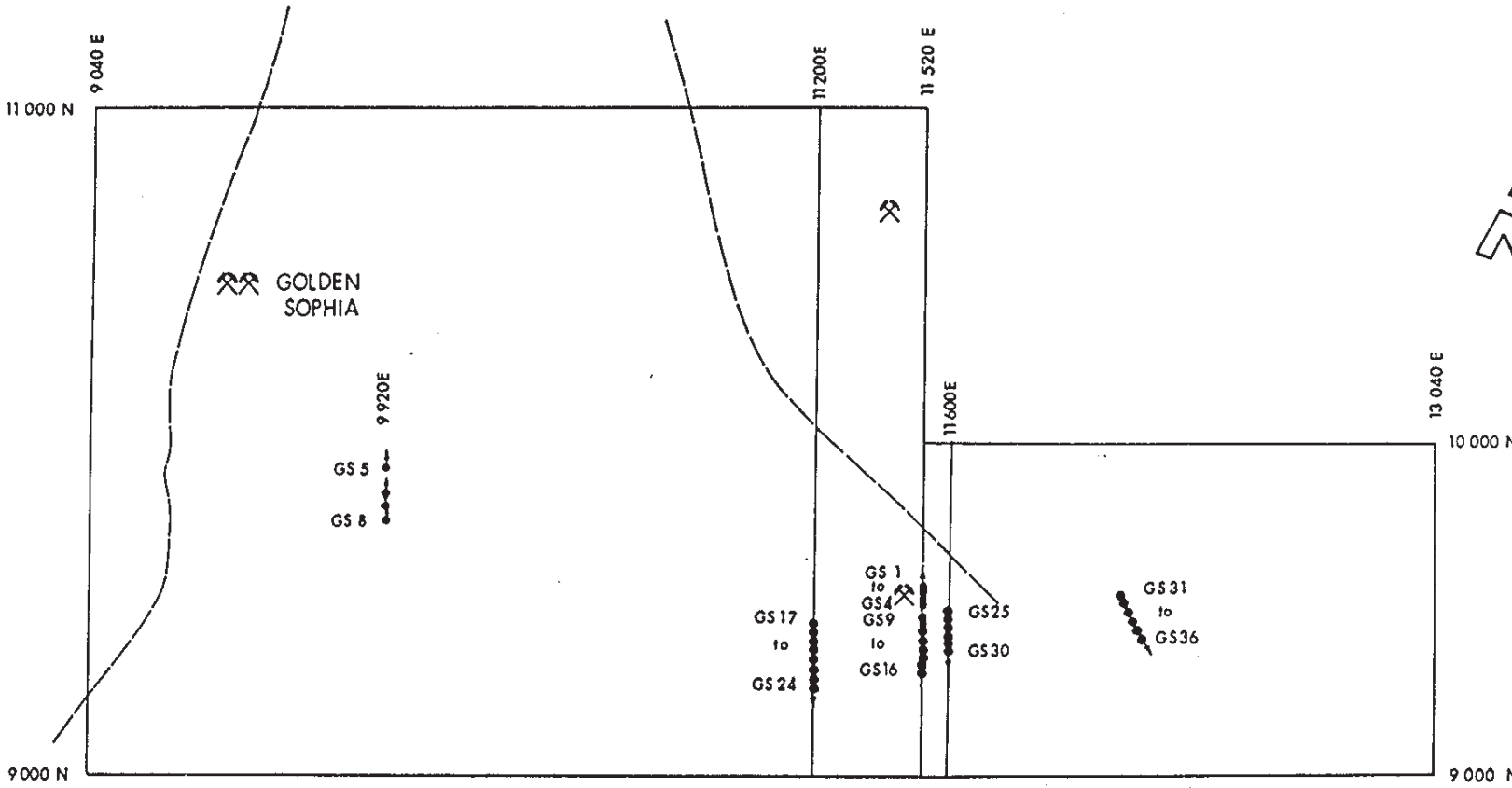

**MANNAHILL GOLD PROJECT** E 1436

Tenement Location and Geology

# EL 1436
# GEOLOGY AND PROSPECT LOCATION

Figure.....12

97-1139 MESA




BATTLE MOUNTAIN (AUSTRALIA) INC.

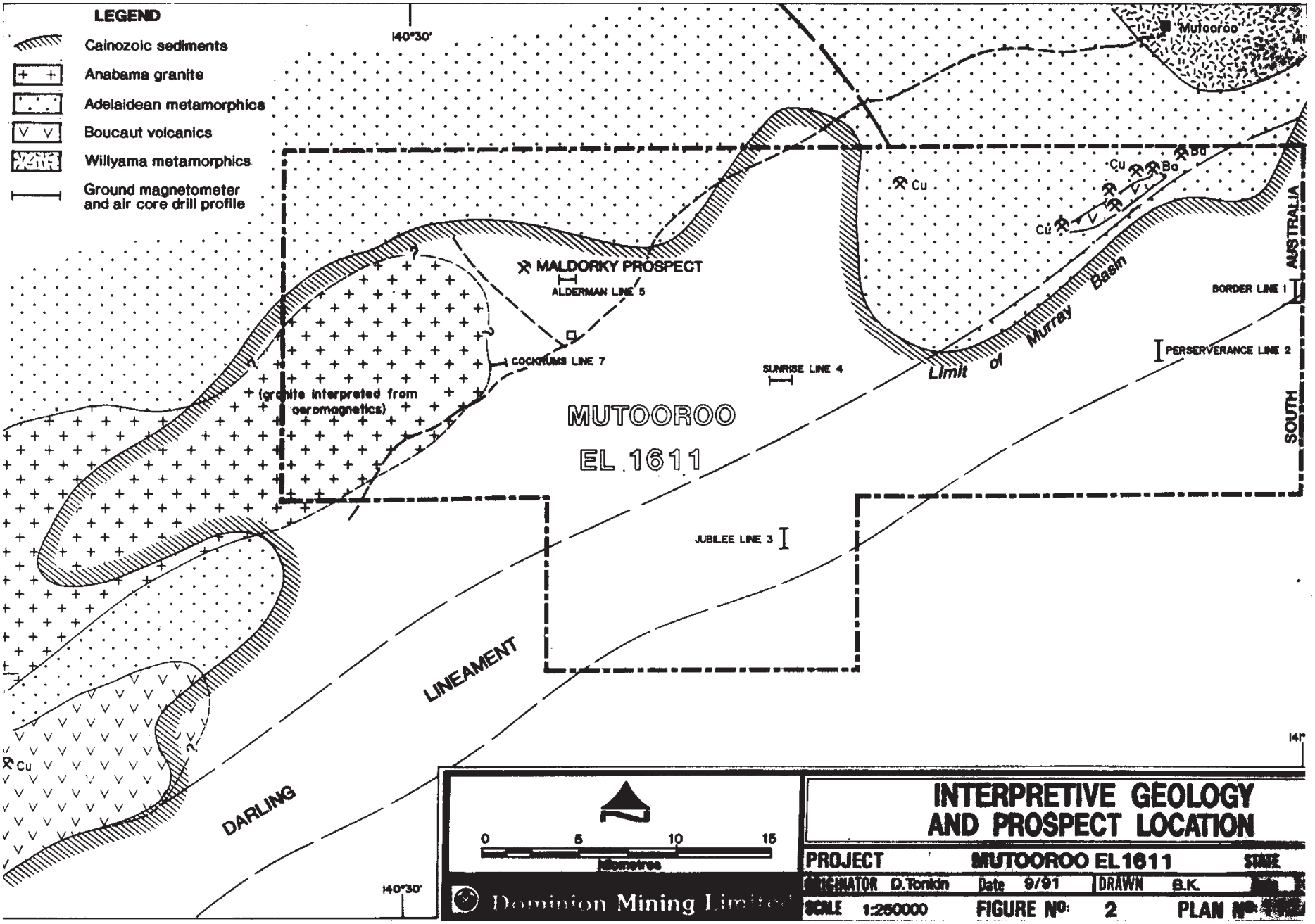
GOLDEN SOPHIA PROJECT

FIGURE 1

Country : Australia
State : W.A.
Latitude : 32° 34'
Longitude : 140° 39'

| | | |
|---|---|---|
| Scale : 1 : 20 000 | Date Revised | Project No. H-350 |
| Data by : C. HEXTALL | | |
| Drawn by : D.M. | | Figure No. 1 |
| Date : DEC. 1988 | | |

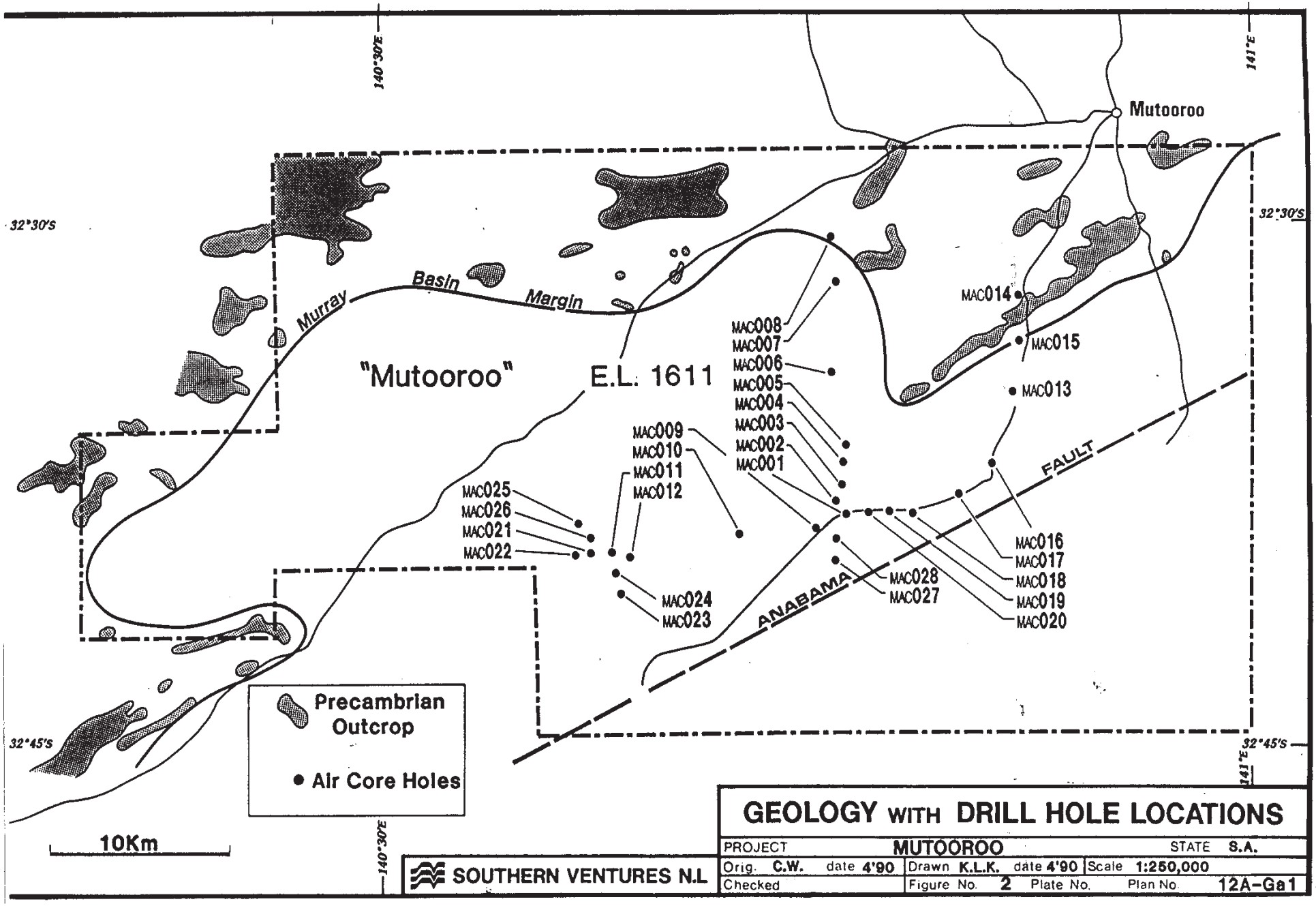
**EL's 1528**
**LOCATION OF PROSPECTS AND DRILL TRAVERSES**




## EL's 1611
## INTERPRETED GEOLOGY, AND PROSPECTS LOCATIONS

Figure.....14

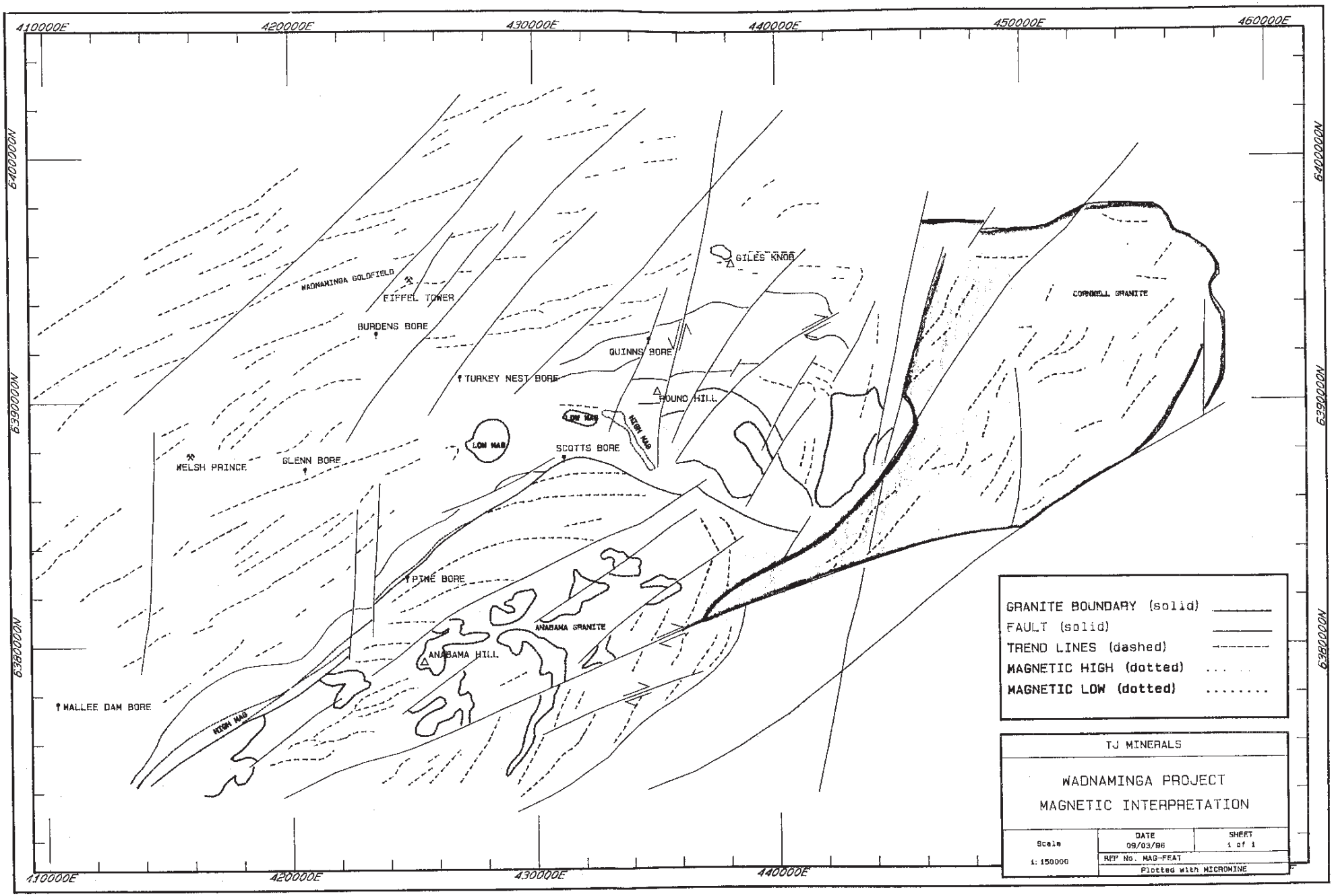
97-1141 MESA




## EL's 1611
## DRILLHOLE LOCATIONS

Figure.....15

97-1142 MESA




# EL 2101
# REGIONAL MAGNETIC INTERPRETATION

Figure.....16

97-1143 MESA