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EL 1961 AND EL 1962

MANNA HILL AND RED HILL

FINAL REPORT FOR THE PERIOD 27/1/95 TO 26/7/95

Submitted by

Equinox Resources NL
1995

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PRIMARY INDUSTRIES AND RESOURCES SA

ENVELOPE 8970

TENEMENT: EL 1961 Manna Hill, EL 1962 Red Hill

TENEMENT HOLDER: Equinox Resources NL

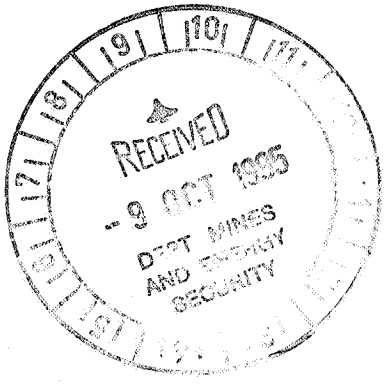
CONTENTS

END OF CONTENTS

MANNA HILL (EL1961) AND RED HILL (EL1962) ADELAIDE FOLD BELT. FINAL REPORT FOR THE 6 MONTHS ENDING 26th JULY 1995.

C. S. Tomich
B Sc. (Hons.)

September 1995



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Summary

This report details the results of exploration undertaken on Exploration Licences EL1961 ("Manna Hill"), and EL1962 ("Red Hill"), in the Adelaide Fold Belt, South Australia, during the 6 month period from 26th January - 26th July 1995. During this time Equinox Resources NL ("Equinox") has undertaken an extensive data review and compilation of previous exploration, geological reconnaissance and prospecting, including visits to sites of known mineralisation, rock chip sampling (51 samples analysed for 16 elements), minor BLEG stream sediment sampling (26 samples analysed for Au & Cu), and detailed interpretation of aeromagnetic data. The principal exploration target was Neoproterozoic Telfer-style Au-Cu mineralisation.

Not surprisingly, high assay results were returned from known workings (maximum of 14.55ppm Au from a gossanous quartz vein dump sample in the Manna Hill Goldfield). The maximum BLEG stream result was 1.2ppb Au north of the Moneo Ridge region. Known Au +/- Cu mineralised sites within the Manna Hill - Waukaringa region are all associated with narrow (typically <0.5m thick) discontinuous quartz-sulphide-gossan veins in which the structural controls on mineralisation are obscure or of only local significance. All of these known sites/prospects have limited tonnage potential and offer no encouragement or pointers for locating large scale buried/blind deposits (ie, in the order of 500,000 oz Au orebodies). At best, another Waukaringa sized orebody, ie approx 40,000-50,000 oz Au, could conceivably exist under cover but would be extremely difficult to locate. The potential for large tonnage alluvial deposits (greater than the Teetulpa Goldfields production of 87,000 oz Au) is also likely to be low.

Interpretation of the 400m line spaced aeromagnetic data has shown that the regional geological picture is far more complicated than reconnaissance investigations and published maps indicate. The region is cut by a series of thrusts and reverse faults typical of thin skinned thrust-fold style terranes. Known mineralisation is associated with small scale structural features which cannot be readily distinguished on the aeromagnetic data. No Telfer type targets or environments were identified and it is likely that direct comparisons between the geology of the Manna Hill - Waukaringa region and Telfer are inappropriate.

In view of the negative results from field work and aeromagnetic interpretation it is recommended that Equinox relinquish the Manna Hill and Red Hill tenements.

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1.0 INTRODUCTION

This report details the results of exploration undertaken on Exploration Licences EL1961 ("Manna Hill"), and EL1962 ("Red Hill"), in the Adelaide Fold Belt, South Australia, during the 6 month period from 26th January - 26th July 1995. During this time Equinox Resources NL ("Equinox") has undertaken an extensive data review and compilation of previous exploration, geological reconnaissance and prospecting, including visits to sites of known mineralisation, rock chip sampling, minor BLEG stream sediment sampling, and detailed interpretation of aeromagnetic data. The principal exploration target was Neoproterozoic Telfer-style Au-Cu mineralisation.

2.0 LOCATION AND ACCESS

The Manna Hill and Red Hill tenements are situated approximately 300km north of Adelaide and 180km southwest of Broken Hill (Figures 1 and 2). The pastoral and service centre of Yunta, on the Barrier Highway, is located within the Manna Hill tenement, and the towns of Peterborough and Orroroo are situated some 40-50km to the south and southwest. The historic gold mining centre and abandoned township of Waukaringa is situated between both tenements, and the historic Manna Hill and Teetulpa Goldfields occur within the Manna Hill tenement.

The tenements occur on the "Orroroo" (sheet SI 54-1) and "Olary" (sheet SI 54-2) 1:250,000 map sheets. On the 1:100,000 map sheet series, the tenements occupy parts of the "Koonamore" (sheet 6733), "Paratoo" (sheet 6732), "Winnininnie" (sheet 6833), and "Yunta" (sheet 6832) sheets.

Access to the area is gained via the sealed Barrier Highway, then via the well formed dirt road to Arkaroola heading north from Yunta. Access within the project area is via a network of 4 wheel drive station tracks. "Florina", "Winnininnie", and "Panaramatee" are the largest pastoral leases in the region.

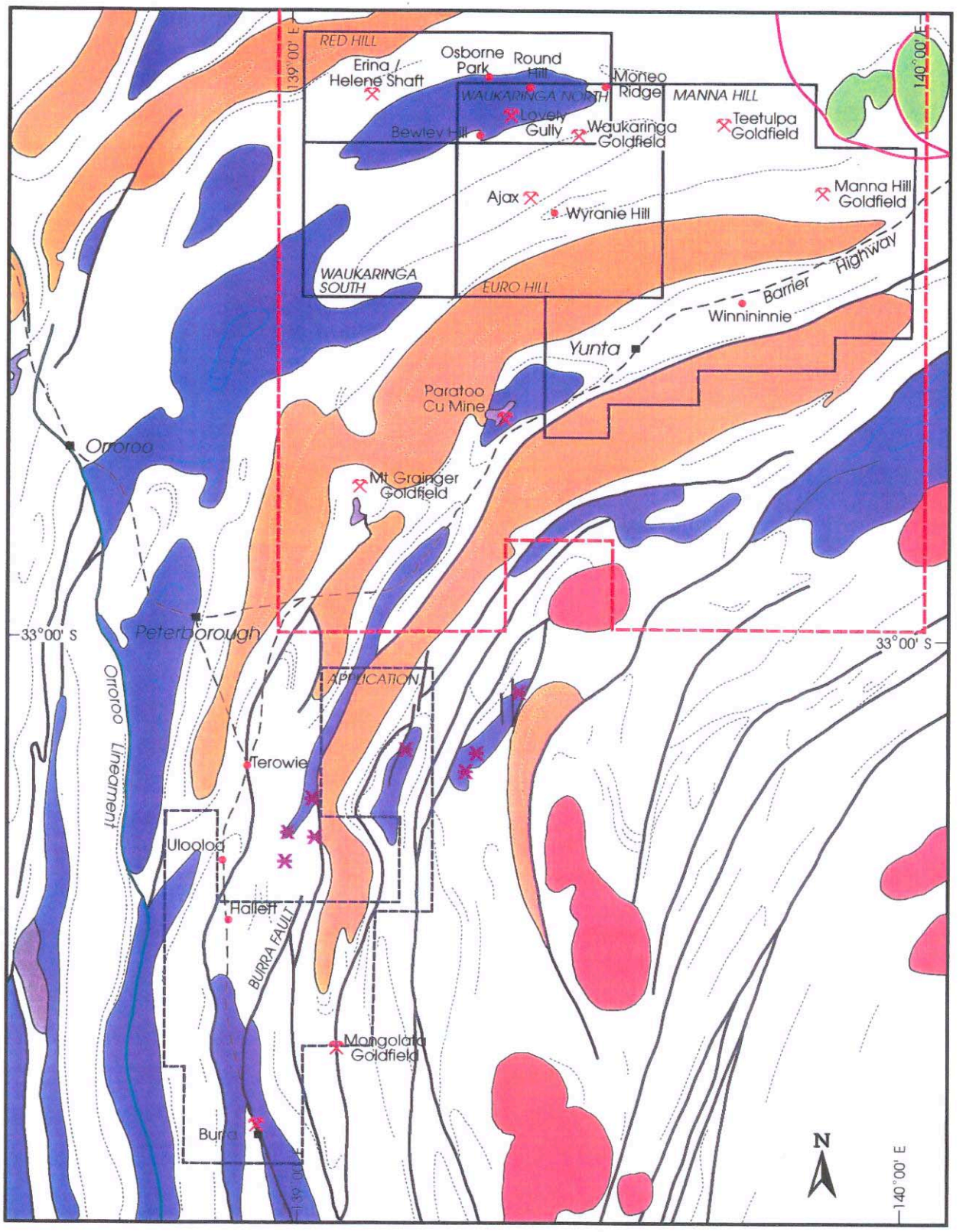
3.0 TENEMENT DETAILS

Tenement details are summarised below;

NUMBER	NAME	AREA	GRANTED	EXPIRY	EXPENDIT.
EL1961	Manna Hill	2,147 km^2	27 July 94	26 July 95	$220,000 pa
EL1962	Red Hill	566 km^2	27 July 94	26 July 95	$80,000 pa

Small mineral leases covering a total area of approximately 17.5 square km, including part of the historic Teetulpa and Manna Hill gold mining centres, are the only excisions from the Manna Hill lease.

An expenditure summary for the 6 months ending 26th July 1995 is shown in Appendix 1.



REFERENCE

- Ordovician (Delamerian) granite under Adelaidean cover
- Tectonic breccias and diapirs

ADELAIDIAN

- Wilpena Group sediments
- Umberatana Group sediments
- Burra Group sediments

- Olary block - Lower Proterozoic

- Kimberlitic Diatremes
- Mine
- Prospect
- Lithological contact
- Trace of layering
- Strike - slip faults
- Thrust faults
- Extensional faults
- Equinox Resources tenement boundary
- Equinox Resources tenement application

GEOLOGICAL INTERPRETATION
of the
NACKARA ARC
portion of the
ADELAIDE FOLD BELT

25km

EQUINOX RESOURCES NL

FIGURE 1 : Location Map

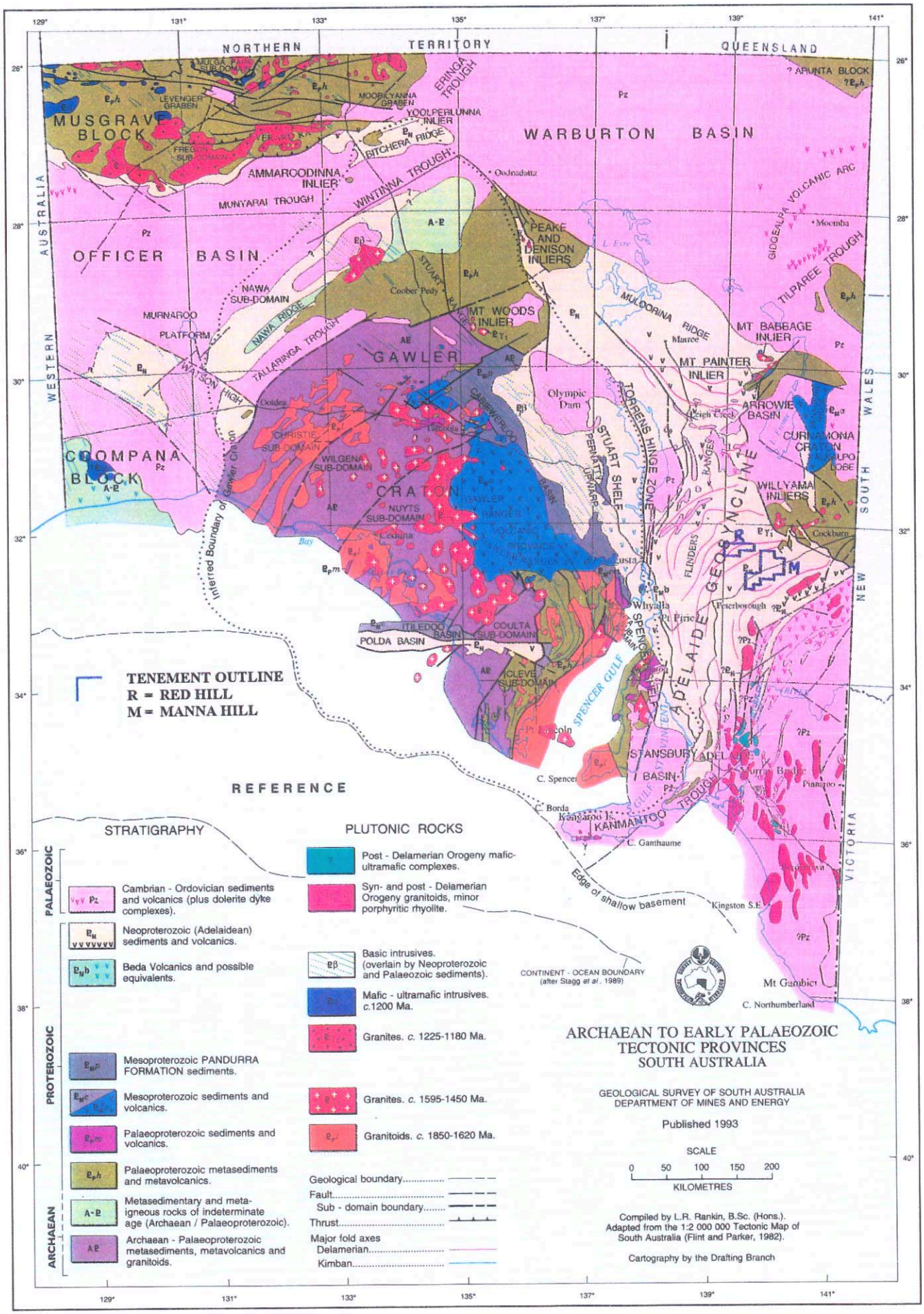


Figure 2: REGIONAL GEOLOGY LOCATION MAP

4.0 PREVIOUS WORK

Numerous old gold mines and diggings occur within the tenements, the most notable being the Teetulpa Goldfield, discovered in 1886, which produced about 87,000 oz of Au (mostly alluvials), and the Manna Hill Goldfield, discovered in 1885, with recorded hardrock production of approximately 5,000 oz Au.

Numerous exploration companies have held tenements and undertaken work over part or all of the project area prior to Equinox's tenure. Much of the earlier exploration company work focussed on evaluation of the historic gold workings, and their covered strike extensions using a syngenetic stratabound Telfer model (especially in the case of the Manna Hill and nearby Waukaringa Goldfields). Little or no consideration was given to the structural controls on mineralisation despite the fact that numerous geochemical anomalies and old workings were located associated with arrays of narrow, locally high grade, quartz-sulphide-gossan veins at various stratigraphic levels.

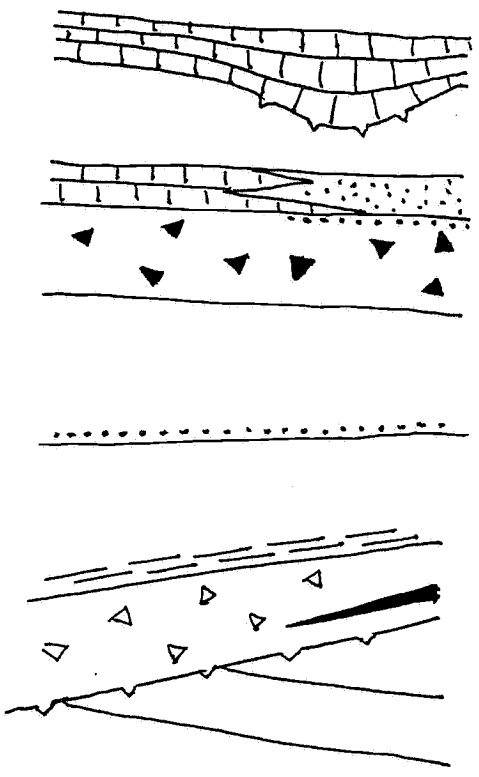
Details of previous exploration in the Manna Hill region are given in Appendix 2, and a summary of previous exploration in the Red Hill - Waukaringa region is given in Appendix 3.

5.0 REGIONAL GEOLOGY

The Neoproterozoic sediments of the Adelaide Geosyncline or Adelaide Fold Belt were deposited in an extensive intracratonic to pericratonic basin generated by rifting and subsidence initiated at about 800Ma (Preiss, 1993). The Neoproterozoic stratigraphy is divided into four Groups with varying degrees of rift and sag phase sedimentation; the earlier Groups (Callanna and Burra Groups) dominated by rift sediments, and the later Groups (Umberatana and Wilpena Groups) dominated by sag phase sediments. The earliest of these, the Callanna Group, not being volumetrically significant in the tenements, is omitted from the stratigraphic column/rock relation diagram (Figure 3).

The Burra Group is composed primarily of coarse grained clastics with minor silts, shales, and carbonates, and is separated from the overlying Umberatana Group by a major basin-wide hiatus. Locally, this is represented by an angular unconformity overlain by basal tillites and ironstones and then the thick interglacial laminated siltstones of the Tapley Hill Formation. This passes through, locally disconformably, to the Cox Sandstone Member (host to Waukaringa Goldfield, Ajax Mine, and other gold mineralisation), and more interglacial siltstones and shales (host to Manna Hill Goldfield and adjacent mineralisation). The upper glacial units at the top of the Umberatana Group include massive tillites, pebbly sandstones, and laminated siltstones. The Wilpena Group in the project area is composed primarily of coarse to fine grained clastics, sometimes calcareous, including the canyon forming Wonoka Formation. The top of the Wilpena Group is marked by a second basin-wide hiatus at the end of the Neoproterozoic.

Sedimentation recommenced at the beginning of the Cambrian (although rocks of that age are not preserved within the tenements) and ceased with the onset of Late Cambrian tectonism known as the Delamerian Orogeny. The outcrop pattern in the tenement area is an elongate dome and basin style produced by the interference of upright, open folds trending northwest with tighter, more dominant, upright east-northeast oriented folds. Historically, the northwest folds have been considered the earlier of the two (Forbes, 1991) , however, Preiss (in prep.) cites evidence of northeasterly folds overprinting earlier folds with north to northwest trending



WILPENA GROUP

Wonoka Formation

Ululpa Siltstone

Nuccaleena Formation/ Seacliff Sandstone

UMBERATANA GROUP

YERELINA SUBGROUP (Includes Grampus Quartzite, Pepuarta Tillite, Gumbowie Arkose)

FARINA SUBGROUP (Enorama Shale, Waukaringa Siltstone, Tarcowie Siltstone, Cox Sandstone Member)

Tapley Hill Formation
Tindelpena Shale Member

Appila Tillite
Holowilena Ironstone

BURRA GROUP

BELAIR SUBGROUP (Kadlinga Slate, Gilbert Range Quartzite)

Mintaro Shale

Saddleworth Formation

Equinox Resources NL

FIGURE 3 : Simplified Stratigraphic Column

Scale 1:100,000
Drawn BJV

Date Jan '95

axes. In the southern part of the Adelaide Geosyncline northwest-directed thrusting plays a significant role in the early stages of the Delamarian Orogeny, however, no thrusts have yet been recognised in the Waukaringa project area. Nevertheless, reinterpretation of existing maps by Equinox (Figure 1) has indicated thrust horizons may exist at the base of the Wilpena and Umberatana Groups, and suggests that mineralisation at Manna Hill, Waukaringa, and other goldfields is hosted in minor, generally layer parallel, splays from these thrusts.

6.0 EXPLORATION MODEL

The nature and age of the host sequence to gold mineralisation in the Nackara Arc portion of the Adelaide Fold Belt is broadly comparable to that hosting the major Telfer gold deposit in Western Australia (current production 400,000 oz Au per annum). Recent work in the Telfer region suggests that mineralisation is structurally controlled, rather than syngenetic as previously thought, and is probably related to the intrusion of younger granites into the host sequence.

During late 1993 and early 1994 Equinox identified a number of faults on regional geological maps and aeromagnetic data of the Nackara Arc which were interpreted to be regional low angle thrust faults. As well as layer-parallel thrusts, other associated structures such as listric thrust ramps, steep reverse faults, and strike-slip faults were also inferred. Such structures are common in similar fold belts elsewhere in the world, and could reasonably be expected to occur in the Adelaide Fold Belt (Figure 1).

Delamarian Orogeny age granite intrusions are believed to have been a major contributor to the hydrothermal activity which resulted in the mobilisation and deposition of mineralisation in the region. Mineralised fluids associated with this hydrothermal activity would be focussed along the layer-parallel and related structures during deformation and deposited in structurally complex dilation zones, leading to deposition of Au +/- Cu mineralisation.

The Manna Hill and Teetulpa Goldfields, plus the nearby Waukaringa and Ajax workings, are believed to have formed in this way.

The Telfer structural mineralisation model is discussed further in Appendix 4 (under headings 4.1 and 4.3.1).

7.0 WORK COMPLETED

7.1 GEOLOGICAL RECONNAISSANCE

Geological reconnaissance and prospecting, plus visits to old workings and exploration prospects, were conducted throughout both tenements and environs with the purpose gaining familiarity with the regional and local geology, establishing the structural and stratigraphic controls on known mineralisation, and to provide background information to assist in the detailed interpretation of the regional aeromagnetic data.

The 1;250,000 scale geology maps of the Orroroo and Olary sheets were the principal geological control used for reconnaissance prospecting. 1:100,000 scale enlargements of these map sheets are shown in Enclosures 1-4.

7.2 ROCK CHIP SAMPLING

Detailed rock chip sampling was undertaken at several old workings and prospects with a view to following-up and verifying previously defined anomalism and characterising the geochemical signatures of the known mineralisation.

A total of 51 rock chip samples were submitted to AMDEL in Adelaide for Au assay by standard fire assay (0.01 ppm detection limit) and a 15 element scan by ICP-OES, including Cu (2 ppm detection limit), Pb (5 ppm), Zn (2 ppm), As (2 ppm), Co (2 ppm), Mn (10 ppm), Fe (100 ppm), Ni (2 ppm), Ag (1 ppm), Bi (5 ppm), Cd (2 ppm), Cr (2 ppm), Mo (3 ppm), P (5 ppm), and V (2 ppm).

Rock chip sample details and assay results are shown in Appendices 5 and 6 respectively. Sample locations are plotted in Enclosures 1-4.

7.3 BLEG STREAM SAMPLING

In the Red Hill tenement, limited BLEG stream sediment sampling was undertaken in the Moneo Ridge region (which occurs mostly on the adjoining Waukaringa North tenement) and over the Erina Prospect to follow-up anomalous heavy mineral concentrate stream sites previously defined by Battle Mountain Australia, and to test the effectiveness of the BLEG stream sediment sampling method.

Twenty six stream sediment samples, comprising 2kg of -5mm sieved material, were submitted to AMDEL for standard BLEG cyanide leach with ICP-MS finish for Au (0.1 ppb detection limit) and Cu (10 ppb).

BLEG stream sediment sample details and assay results are shown in Appendices 7 and 8 respectively.

7.4 AEROMAGNETIC DATA

In late 1993 / early 1994 Equinox purchased the South Australian Exploration Initiative Area B2 aeromagnetic survey data covering part of the Olary 1:250,000 map sheet. A large portion of the Manna Hill tenement is covered by this survey. The aeromagnetic data was acquired at 400m line spacing (flown north/south) at 80m flying height, with east/west tie lines flown every 4km. Older aeromagnetic survey data covering part of the Olary Block was also integrated with the B2 survey data. The data was processed by Pitt Research in Adelaide.

In January 1994, Equinox signed an agreement with MESA to jointly fund an aeromagnetic survey over parts of the Orroroo and Burra 1:250,000 map sheets. This survey, comprising part of the South Australian Exploration Initiative Area B6 was flown in late 1994, and covered the bulk of the tenement area on the Orroroo sheet. Survey specifications are identical to those described above. Processing and imaging of this survey data was

extremely slow such that the final products were not received from Pitt Research until February-March 1994, resulting in major delays to the aeromagnetic interpretation effort.

Details of the interpretation of this data are given in Appendix 4 and an aeromagnetic interpretation map is included as Enclosure 5. Final interpretation was undertaken at 1:100,000 scale. The aeromagnetic coverage for the region is shown as a dashed red line in Figure 1.

8.0 RESULTS

8.1 GEOLOGY AND MINERALISATION

Large scale northeast to north-northeast trending folds dominate the geology of the tenements with the broad open Waroonee Syncline being the most prominent structural feature. The Hanken and Waukaringa Anticlines form slightly tighter (but still relatively open) folds. The Paratoo-Winnininnie Anticline is a much tighter structure. A locally complex set of parasitic folds occur on the northern limb of the Waukaringa Anticline. Outcrop over much of the area is subdued where fine grained shales, siltstones, dolomitic sediments, and silty sandstones form the cores of the large scale folds. Tillites and fine to medium grained sandstones/quartzites commonly form prominent ridges on the limbs of, and sometimes centrally within the folds. Most of the sedimentary package belongs to the Neoproterozoic Umberatana and Wilpena Groups with the underlying Burra Group sediments being less well developed.

At the Winnininnie Dome an anticlinal closure occurs over a distance of several hundred metres and represents the tightest fold structure in the area. A strong subvertical axial plane cleavage is present in siltstones and sandy siltstones of the Tarcowie Siltstone and Waukaringa Siltstone, locally capped by silty sandstone of the Cox Sandstone Member.

A prominent ovoid magnetic anomaly (intrusion or diapir), possibly up to 5km in diameter, has disrupted the magnetically prominent Holowilena Ironstone and adjacent sediments in the vicinity of a possible large scale drag fold on the north limb of the Waukaringa Anticline. The source of this anomaly is unknown as outcrop is poor.

In the Manna Hill Goldfield most mineralisation is hosted by quartz-sulphide-carbonate veins, sometimes highly gossanous, typically <1m thick (usually <0.3m thick), dipping shallowly to flat to the S or SSE. The stratabound mineralised veins occur in several different stratigraphic horizons within dolomite, dolomitic siltstone, and more rarely, siltstone, of the Enorama Shale. At the Homeward Bound Mine the line of workings strike for approximately 800m and are cut off to the west by a barren steep quartz vein. The Eudunda Hope - Elsie May - Westward Ho! line of workings extend for 3-4km and the mineralised vein is locally gently folded and has a flat attitude in places. A 50^0 south dipping gossanous vein within the Cox Sandstone Member of the Tarcowie Siltstone has been exploited at the Royal Charlie Mine. This mineralisation appears to be identical to that at Waukaringa and Ajax Mines in the Waukaringa Goldfield. Steep south dipping cleavage parallel veins occur at the Birthday and Aurora Australis line of workings. Here, the ferruginous quartz veins are up to 1.5m wide. Smaller cleavage parallel veins occur at the Nectar and No Gammon mines. Several of the larger workings have been previously drilled with mixed results. The thinness of the mineralised veins in all Manna Hill workings suggests low tonnage potential.

Numerous shallow hardrock workings are developed on steep quartz veins in the low hills surrounding the Teetulpa Goldfield. The weakly ferruginous quartz veins strike N/S and dip subvertically, with most being <0.5m thick. Another prominent set of barren white quartz veins strike E/W, dipping shallowly to moderately S. The intersections of both vein sets have been worked in several old diggings. The host rocks are dolomitic siltstone, dolomite, and siltstone of the Tapley Hill Formation. The source of the alluvial gold in the area is unknown and is likely to be unrelated to any of the veins exposed in existing hardrock workings.

The extreme northern portion of the Moneo Ridge Prospect occurs on the southern edge of the Red Hill tenement, on the northeastern nose of the Waukaringa Anticline, in an area of complex drag folding. A series of fine to medium grained discontinuous sandstone/quartzite lenses occur within the Appila Tillite and outcrop as prominent ridges between lower relief and more common siltstone outcrops. The principal mineralised sandstone/quartzite ridge (within the adjoining Waukaringa North tenement) trends 300^0-310^0, dips 40^0-70^0 N to NE, and varies in width from <5m up to 30m. Two steep to subvertical dipping vein sets are present. The regional more persistent vein set trends 060^0-080^0 and cross-cuts both siltstone and sandstone lithologies, varying from 5cm to over 5m in width, and composed of milky quartz containing few ferruginous patches, ie "barren looking". The mineralised vein set trends approximately 010^0-025^0, averages 1-5cm width (rarely >30cm), and comprises ferruginous and gossanous vein quartz with distinct 1-20cm wide silicified and pyritic alteration halos. Mineralisation may be in part controlled by the intersection of both vein sets. The mineralised vein set occurs only in sandstone units and does not extend into the adjacent siltstones and appears to have formed during brittle folding of the more competent sandstone lenses (syn-regional folding ?). Vein density ranges from 2-3 veins per metre to 1 vein per 20m. Tonnage potential is low.

The Erina Prospect in the Red Hill tenement comprises a well laminated quartz vein up to 0.5m thick, containing minor ferruginous and gossanous patches with occasional malachite staining. The stratabound vein dips 30^0 to the north, strikes at least 1.1km, and is hosted by dolomite and fine grained siltstone and silty sandstone (near Tapley Hill Formation and Tarcowie Sandstone contact?). Stretching lineations are mostly down dip. This vein has broad similarities with the Waukaringa and Ajax mineralised veins but is far less gossanous and less deformed. No drilling has been carried out at this prospect.

The Helene Shaft is located 2-3km to the west and along strike from the Erina Prospect. A prominent ironstone vein up to 3m wide, with varied orientation, outcrops at the surface.

Small Cu workings south of Helene Shaft are developed in malachite and azurite stained dolomites - they appear to be surficial and of very limited extent.

The Johnsons Gully or Osborne Prospect alluvial workings in the Red Hill tenement appear to be derived from weakly ferruginous quartz veins of variable orientation and limited extent, hosted by fine to medium grained sandstones. Hardrock mineralisation potential is low.

8.2 ROCK CHIP SAMPLING

Not surprisingly, the highest assay results were returned from old workings in the Manna Hill Goldfield. The highest individual assay was 14.55ppm Au (sample 255) - a dump sample of gossanous quartz vein at the Royal Charlie Mine. Pit spoils of massive and laminated ferruginous vein quartz at the Homeward Bound Mine assayed 9.87ppm. Anomalous assays of ferruginous quartz and gossan dump/shaft spoils were also returned from the Eudunda Hope, Elsie May, and Westward Ho! line of workings. Copper, silver, and arsenic anomalism are also associated with several of these samples.

A maximum assay of only 0.16 ppm Au was recorded from the ferruginous quartz veins in workings at the Teetulpa Goldfield.

The ferruginous quartz vein at the Erina Prospect is weakly anomalous in Au - maximum of 0.21ppm. The same anomalous sample assayed 12,000ppm Cu.

An ironstone vein in old copper diggings at the west end of the Winnininnie Dome assayed up to 5% Cu, 550ppm Ag, and 1,010ppm Bi (sample WD11), but low Au. A nearby erratically ferruginous, discontinuous quartz vein assayed 2.45ppm Au (sample WD04). Near the east end of the Winnininnie Dome, narrow, erratically ferruginous quartz veins returned anomalous Ag values up to 170ppm (sample WD13).

All anomalous rock chip results are associated with narrow, often discontinuous, quartz-sulphide-gossan veins which appear to have limited tonnage potential, and where the structural controls on mineralisation are obscure or of only local significance.

8.3 BLEG STREAM SAMPLING

A maximum assay of only 1.2 ppb Au was recorded from a stream north of the Moneo Ridge Prospect. The strong heavy mineral concentrate stream anomalies at both the Moneo Ridge and Erina Prospects, previously defined by Battle Mountain Australia, were not repeated during the BLEG orientation sampling. BLEG sampling is likely to be a more reliable technique and give more meaningful results than heavy mineral concentrate sampling (which is very dependent on the quality of the trap site and the quality of the sampler).

8.4 AEROMAGNETIC INTERPRETATION

Results of the aeromagnetic interpretation are described in detail in Appendix 4. In summary these results are:

- The regional structure is far more complicated and discontinuous than is shown on published maps;
- Geometries observed are typical of thin skinned thrust-fold style terranes;
- Two main thrust styles have been observed, (i) small displacement layer parallel "early" thrusts, including one prominent one at or near the Umberatana Group / Wilpena Group contact, and (ii) high angle "late" reverse faults associated with folding;
- A NW to NNW tectonic transport direction is indicated, based on fold terminations, fold axial plane orientations, and across strike fault / discontinuity orientations;
- Breccia, probably tectonic, and diapiric intrusions mapped as belonging to the Callanna Group (basal Middle Proterozoic) are intimately associated with faults;
- Folds, especially synclines, are mostly open with broad flat dipping hinges and more localised steeper limbs ("box folds" - also observed in the field);
- Anticlines are generally tighter structures than synclines;
- In some cases fold limbs are truncated by "early" and/or "late" thrusts;
- In areas of low angle layering (typically fold hinge regions with flat dip), geometries cannot be resolved by existing aeromagnetic data;
- The aeromagnetic pattern has been complicated by a set of NW and NE trending late dykes, veins, and/or joints which range from cross-cutting to layer parallel;
- The margins of the Olary Block have been involved in Adelaide Fold Belt thrusting, particularly in the eastern portion of the tenement block;

- Most of the region is underlain by a basal thrust detachment (décollement) which may surface in the vicinity of the Teetulpa Goldfield;
- Most known Au-Cu mineralisation is associated with small scale structures which are not always readily identified on the aeromagnetics;
- Telfer-type targets or environments have not been identified in any of the existing tenements and direct comparisons seem inappropriate - potential is low;
- Slate-belt models for gold mineralisation are not applicable.

9.0 CONCLUSIONS AND RECOMMENDATIONS

Equinox was first attracted to the Nackara Arc portion of the Adelaide Fold Belt because of its broad age, lithological, and structural similarities with the giant Proterozoic Telfer gold deposit in Western Australia. Additionally, previous exploration in the Manna Hill - Waukaringa region had focussed on a stratabound syngenetic model for gold and copper mineralisation with little consideration having been given to the structural epigenetic controls on mineralisation.

An extensive data review and compilation of previous exploration work, geological reconnaissance and prospecting, including visits to sites of known mineralisation, rock chip sampling (51 samples analysed for 16 elements) , minor BLEG stream sediment sampling (26 samples assayed for Au & Cu), and detailed interpretation of aeromagnetic data have been undertaken in the 6 months to 26th July 1995.

Known Au +/- Cu mineralised sites within the region are all associated with narrow (typically <0.5m thick) discontinuous quartz-sulphide-gossan in which the structural controls on mineralisation are obscure or of only local significance. All of these known sites/prospects have limited tonnage potential and offer no encouragement or pointers for locating large scale buried/blind deposits (ie, in the order of 500,000 oz Au orebodies). At best, another Waukaringa sized orebody, ie approx 40,000-50,000 oz Au, could conceivably exist under cover but would be extremely difficult to locate. The potential for large tonnage alluvial deposits (greater than the Teetulpa Goldfields production of 87,000 oz Au) is also likely to be low.

Interpretation of the regional aeromagnetic data returned negative results. The interpretation has shown that the regional geological picture is far more complicated than reconnaissance investigations and published maps indicate. The region is cut by a series of thrusts and reverse faults - some intimately related to large scale folding - typical of thin skinned thrust-fold style terranes. Known mineralisation is associated with small scale structural features which cannot be readily distinguished on the aeromagnetic data. No Telfer type targets or environments were identified and it is likely that direct comparisons between the geology of the Manna Hill - Waukaringa area and Telfer are inappropriate.

In view of the above negative results it is recommended that Equinox relinquish the Manna Hill and Red Hill tenements.

10.0 REFERENCES

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APPENDIX 1

EXPENDITURE SUMMARY

Expenditure Statement
Manna Hill E1961
Expenditure for the 6 months to 26 July 1995

		Total
1.0	**Salaries**	
1.1	Equinox Salaries	10,514.00
1.2	Other Salaries	0.00
1.3	Outside Contractors	849.00
1.4	Travel	595.00
1.5	Accom & meals	515.00
	subtotal 1.0	12,473.00
2.0	**Contractors Services**	
2.1	Analytical	881.00
2.2	Drilling	0.00
2.3	Earthmoving	0.00
2.4	Geophysics	0.00
	2.41 Aeromagnetics	1,385.00
	2.42 Image Processing	0.00
	2.43 Ground Magnetics	0.00
2.5	Petrology	0.00
2.6	Surveying	0.00
2.7	Gridding	0.00
2.8	Remote Sensing	0.00
	2.81 Satellite Imagery	0.00
	2.82 Aerial Photography	0.00
	subtotal 2.0	2,266.00
3.0	**Field Expenses**	
3.1	Camp Equipment	0.00
3.2	Expendable Camp Supplies	71.00
3.3	Expendable Field Supplies	0.00
3.4	Freight	24.00
3.5	Vehicle costs	1,030.00
	subtotal 3.0	1,125.00
4.0	**Office/Field Expenses**	
4.1	Computer	85.00
4.2	Courier/Postage	4.00
4.3	Drafting	111.00
4.4	Plan printing/copying	313.00
4.5	Phone/fax	0.00
4.6	Maps & reports	153.00
4.7	Other	0.00
	subtotal 4.0	666.00
5.0	**Acquisition Costs**	
5.1	Application costs	0.00
5.2	Rent	0.00
5.3	Rates	0.00
5.4	Purchase payments	0.00
	subtotal 5.0	0.00
6.0	**Generative**	363.00
	subtotal 6.0	363.00
	Sub-Total	16,893.00
7.0	**Overheads 20%**	3,378.60
	TOTAL	20,271.60

Expenditure Statement
Red Hill EL1962
for the 6 months to 26 July 1995

		Total
1.0	**Salaries**	
1.1	Equinox Salaries	5,744.00
1.2	Other Salaries	0.00
1.3	Outside Contractors	212.00
1.4	Travel	294.00
1.5	Accom & meals	179.00
	subtotal 1.0	6,429.00
2.0	**Contractors Services**	
2.1	Analytical	384.00
2.2	Drilling	0.00
2.3	Earthmoving	0.00
2.4	Geophysics	0.00
	2.41 Aeromagnetics	10,635.00
	2.42 Image Processing	0.00
	2.43 Ground Magnetics	0.00
2.5	Petrology	0.00
2.6	Surveying	0.00
2.7	Gridding	0.00
2.8	Remote Sensing	0.00
	2.81 Satellite Imagery	0.00
	2.82 Aerial Photography	0.00
	subtotal 2.0	11,019.00
3.0	**Field Expenses**	
3.1	Camp Equipment	0.00
3.2	Expendable Camp Supplies	56.00
3.3	Expendable Field Supplies	0.00
3.4	Freight	24.00
3.5	Vehicle costs	1,354.00
	subtotal 3.0	1,434.00
4.0	**Office/Field Expenses**	
4.1	Computer	0.00
4.2	Courier/Postage	27.00
4.3	Drafting	151.00
4.4	Plan printing/copying	113.00
4.5	Phone/fax	0.00
4.6	Maps & reports	0.00
4.7	Other	0.00
	subtotal 4.0	291.00
5.0	**Acquisition Costs**	
5.1	Application costs	0.00
5.2	Rent	0.00
5.3	Rates	0.00
5.4	Purchase payments	0.00
	subtotal 5.0	0.00
6.0	**Generative**	132.00
	subtotal 6.0	132.00
	Sub-Total	19,305.00
7.0	**Overheads 20%**	3,861.00
	TOTAL	23,166.00

APPENDIX 2

PREVIOUS EXPLORATION SUMMARY
MANNA HILL REGION

Mannahill EL
Nackara Arc, Adelaide Geosyncline
South Australia

Review of Previous Exploration

(MODIFIED)

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1.0 INTRODUCTION

Goldfields in the Nackara Arc of the Late Proterozoic Adelaide Geosyncline resemble Telfer-style gold deposits in many aspects: gold is commonly associated with paraconformable ferruginous quartz vein systems in low metamorphic grade, gently folded clastic sediments (dolomitic siltstone and sandstone) intruded by high-level granites.

In recent years, there has been a recognition that structural controls on orebodies at Telfer are critical and more important than previously recognised. Also in recent years, it has been recognised that the structural history of the Adelaide Geosyncline has involved early thrusting events superimposed on complex sequence stratigraphies.

Therefore, it is timely to re-appraise goldfields in the Nackara Arc in the light of these new findings.

Historically, Mannahill Goldfield was one of the main fields in the Nackara Arc with total production in excess of 155 500 grams of gold. Gold was discovered in 1885 and the two main producers were the Homeward Bound and Westward Ho! Mines. The Mannahill Goldfield is the central target of this exploration proposal but the area under application also encloses the Teetulpa Goldfield, another historically important producer but under current Mining Lease, and several small gold mines and prospects identified by previous mineral exploration but never drilled or fully evaluated.

The Manna Hill tenement E1961 (Figure A) covers an area of approximately 2 147km^2 including the Mannahill and Teetulpa Goldfields although some of the old workings, particularly at Teetulpa, are covered by current mining leases (approx. 17.5km^2).

2.0 METHODS

A review of previous exploration and mining has been undertaken. Much of this information is stored in open file envelopes and reports at the Document Storage Centre of MESA and was located following an initial search of the MESA SAMREF bibliographic database using the OLARY and ORROROO mapsheets and Mineral Exploration as the search criteria. SAMREF includes brief abstracts of the contents of many envelopes or reports and these have been expanded and updated for inclusion in this report (at the end of this text section); abstracts have been written for SAMREF listings that did not originally have such.

Geochemical assays and drilling are being compiled from open file information onto various base maps for analysis and identification of features or relationships thought to be prospective and worthy of further investigation. Preliminary maps of some areas are presented with this report.

3.0 RESULTS

3.1 Regional Geology

Mineralisation at Mannahill Goldfield occurs in a series of concordant ferruginous quartz veins and quartz-vein stockwork systems predominantly within the Enorama Shale member of the Neoproterozoic (Adelaidean) Umberatana Group (Figs A & B). Royal Charlie Gold Mine just to the NW of the main goldfield is within the basal Cox Sandstone Member of the Tarcowie Siltstone and Teetulpa Goldfield is a combination of both alluvial workings and discordant quartz vein systems in lower Tapley Hill Formation (Fig. C).

Enorama Shale is a predominantly green, planar-laminated, calcareous to dolomitic siltstone with minor sandy siltstone; sand intercalations increase up sequence towards the contact with Gumbowie Arkose. Siltstone beds may be incipiently graded but are generally featureless and well sorted. Dolomite is fine-grained, sparry, ankeritic, of diagenetic origin and ferruginised due to weathering.

Mineralised quartz veins within the Mannahill Goldfield are characteristically south-dipping parallel to bedding although some cross-sections constructed from drill sections infer local discordance on a macroscopic scale. Furthermore, in detail, the quartz vein systems of individual mines occur at different stratigraphic levels within the Enorama Shale (Fig. D).

Although principally quartz, the veins are composite mixtures of quartz and calcite with accessory Fe-sulphides (pyrite, pyrrhotite $\pm$ chalcopyrite & arsenopyrite), chlorite, flaky ilmenite and gold. Vein calcite is ferroan, manganiferous and limonitic when weathered. Quartz is extensively recrystallised due to overprinting deformation associated with folding and cleavage development and marginal areas of host lithologies are variably silicified with thin veinlets of quartz grading into massive silicified zones with only corroded relics of pelite (see Report CMS 84/7/29, Envelope 5260).

Mannahill Goldfield occurs along the northern limb of the Winnininnie Syncline, a major regional fold extending for about 100km in strike length. Along the Homeward Bound-Jacksons-Eudunda Hope-Westward Ho! line of workings, bedding dips consistently 20-25°S and is crosscut by a well-developed, steeply dipping (ca. 50-75°N) cleavage which is axial planar to the regional syncline. 400m N of Homeward Bound, there is a ridge of relatively intense folding with variable dips to both the N and S. This has been interpreted to represent a monoclinal flexure on the limb of the regional structure.

Cross-cutting fractures are well developed in several parts of the tenement. In the region of the Birthday line of workings, the predominant fracture direction is 040-065° with parallel quartz veins, while at Poverty Dam within the regional Teetulpa Fracture Zone, fractures are oriented NNW also with parallel ferruginous quartz veining. The Teetulpa Fracture Zone has been identified from both aerial photograph and Landsat TM image interpretation.

3.2 Mining History and Mine Geology

Mannahill Goldfield was proclaimed in 1886 following discovery of gold at the Nectar and No Gammon reefs in 1885 and Westward Ho! in 1886. A twenty head stamp battery operated at Westward Ho! between 1887 and 1889 and mining has continued sporadically in the field since that date.

Teetulpa Goldfield was also discovered in 1886 with discovery of several pieces of gold within bedrock in Bradys Gully and within two months there were 5 000 prospectors on the field.

There are current mining leases over Westward Ho!, Royal Charlie and Teetulpa but the former are only small, and there are a couple of mineral claims on the SE edge of Teetulpa Goldfield. The total area covered by leases excised from the Equinox Manna Hill tenement is approximately 17.5km^2.

Westward Ho!

This is the largest mine in the goldfield with a recorded production of 34 729gm gold from about 4 000 tonnes of ore. Production began in 1886 but figures are incomplete for the first two years of operation and it has been suggested that production may have been as high as 100 000gm gold (Hallmark Gold NL; Envelope 6971). In March 1887, a parcel of 25.4 tonnes of ore yielded 933.25gm (36.74g/t Au) with tailings assaying 30.03g/t (Horn, 1987). Ore treated at Peterborough State Battery totals 523 tonnes and yielded 8 335.78gm gold bullion (15.94g/t Au). It has been suggested that recovered grades varied from 7-17g/t.

The main shaft extends 77.7m on an underlay which has been extensively stoped in the upper levels above the water table along a strike length of ca. 60m.

The lode formation at Westward Ho! is a stratabound quartz-sulphide-siderite vein which can be followed for a length of ca. 1.5km and which dips approximately 15-20°S. The hanging wall contact is often intensely folded with tight crenulations in a narrow layer of sacharoidal recrystallised quartz. The main vein is massive recrystallised iron-stained quartz-carbonate varying in width from 50cm to 2.4m and dipping gently S (Fig. E). It is locally folded into a gentle monoclinal flexure and the width of the lode is ca. four times thicker in the anticlinal arch. This thickening has been attributed to remobilisation during folding and there is some associated brecciation and secondary veining of the country rock (Jarmand Minerals and Exploration NL, Envelope 5260). Below 70m in the main underlay shaft (ca.15m below the surface due to the flat dip), ore comprises quartz with abundant pyrite and arsenopyrite in a lode 2.4m thick and assaying 9.2g/t at the bottom of the shaft.

A chip sample from the 80cm-thick lode vein in the eastern wall of the main decline assayed 6.73g/t Au, 0.59ppm Ag, 4 463ppm As, 2 062ppm Cu and 27.0% Fe (p0030, Envelope5260). Newmont samples from pillars in the main workings range from 3.77g/t over 2.4m to 1.03g/t over 1.0m (Fig. E), and Amax Australia report an average grade of 2.7g/t over a thickness of 1.5m in the wall of the stope.

Drillhole WHP1 (Elvire Pty Ltd; Envelope 1833), drilled immediately south of the main workings, intersected 1.5m at 20.6g/t Au at a depth of 13.7m and drillhole WH-1 (Kingsway Minerals NL; Envelope 2778) intersected 0.13m at 33.0g/t at a depth of 26.38m. Best intersections in WH-2, WH-3 and WH-4 were two intervals of 1.4g/t in WH-4. Newmont drilled a series of holes at 200m spacing along strike from Westward Ho! (Fig. 5) and although all holes intersected the lode horizon varying from 0.5-1.5m in thickness, gold assays were erratic: M12 (200m east) intersected 4.73g/t Au from 21.5-22.0m, M11 (400m east) intersected 0.41g/t Au from 32.0-32.5m and M10 (600m east) intersected 3.21g/t Au from 29.0-29.5m and 3.18g/t Au from 30.5-31.0m. A report by Aminco and Assoc. for Jarmand Minerals (Envelope 5260, p0031) suggests that Newmont's results might be understating the true gold content due

to suspect drilling techniques. Nevertheless, based on these results, they concluded that there was still ca. 300 000 tonnes of ore at Westward Ho! and extending along strike to Elsie May (1100m strike length x 100m down dip x 1m thick).

MESA have investigated the tailings at Westward Ho! (Horn, 1987) and believe there is a resource of ca. 4 900 tonnes containing 3.97g/t Au.

A small Mining Lease is current over the main Westward Ho! mine (Fig. B).

Homeward Bound

Workings at Homeward Bound extend for ca. 800m along strike and produced at least 45 379gm gold at an average grade of 46.09g/t from ca. 1 000 tonnes of ore. Early crushings to 1904 averaged between 7.2 and 243.9g/t.

The stratabound ore horizon at Homeward Bound extends over a strike length of 1.5km and old workings comprise more than 40 inclined shafts and shallow opencuts. The main workings extend to 100m on a shallowly inclined underlay shaft. Average vein width is 0.36m.

The quartz lode horizon varies from saccharoidal and distinctly banded to glassy vein quartz (particularly in dilatant zones associated with monoclinal flexures), carbonate and ferruginous material with traces of malachite. The lode is stratabound within laminated dolomitic siltstones, ranges from a few centimetres up to 80cm thick and dips shallowly (20-30°) south. Vein material frequently contains tight chevron and kink folds which are not evident in the overlying sediments. Footwall sediments contain up to 5% of disemminated limonitic 'spots' which may represent former pyrite. Kingsway Minerals NL (Envelope 2778) reported two sets of cleavage at Homeward Bound: 245-255°/70-85°S and a minor set 170-190°/60-75°E.

Newmont rock-chip samples from within the main workings ranged up to 17g/t over 0.3m but indicated an average grade of 4.3g/t. Jarmand Minerals reported assays from chip channel sampling over 15cm as 1.66g/t Au, 0.34ppm Ag, 565ppm Bi, 5.91% Fe and anomalous Cu, Pb, Zn and Mn (but relatively low As). However, like Newmont samples, assays were erratic.

Kingsway Minerals NL drilled two diamond drillholes at Homeward Bound. HB-1 intersected 0.2m of 18.4g/t gold at 37.7m and HB-2 intersected 0.2m of 3.1g/t at 35.65m.

Slimes at Homeward Bound contain up to 4.8-6.1g/t Au but volume is small.

Elsie May

Elsie May line of workings define an arcuate line approximately 1200m in length and approximately 300m north of the Westward Ho!-Eudunda Hope-Jacksons line. Outcrop is poor but the average sampled width of lode is 0.74m and it dips shallowly south to almost subhorizontal. Footwall siltstones locally contain minor 1-3mm thick conformable quartz veinlets; these are often connected by cross-cutting fractures.

The quartz lode is very similar to Westward Ho! but surface samples indicate lower grades. Average grade reported by Newmont was 2.3g/t whereas Jarmand reported assays of 0.38g/t , 0.23g/t and 0.68g/t Au respectively from composite lode material and channel sampling (2

samples). The latter also contained 1.87ppm Ag, 2060ppm As, 1625ppm Cu, 24.6% Fe, 15.8ppm Cd and 962ppm Zn.

Newmont drilled a line of holes across strike from Elsie May to the Westward Ho!-Eudunda Hope line and intersected the lode horizon in each hole. Best assays were 2.59g/t in M4 (12.5-13.0m) and 2.09g/t in M1 (21.5-22.0m). Their interpretted cross-section (Fig. E) shows the lode flattening out in a monoclinal flexure between Elsie May and the Westward Ho!-Eudunda Hope line but surface outcrops do not support a corresponding flattening of bedding in host sediments. This suggests that either the lode veins are not connected between drillholes or that the lode is locally discordant. There is plenty of scope for further drilling along the Elsie May line with particular emphasis on the source of structural discordance where dilation may permit thickening of lode veins.

Eudunda Hope

Eudunda Hope comprises a cluster of shallow shafts, open workings and a vertical shaft to 34.6m. Five tonnes of ore were crushed in 1887 for an average 36.7g/t and 32.7 tonnes were crushed at Peterborough in 1898 for an average 7.4g/t Au.

Lodes comprise two narrow stratabound quartz veins in local anticlinal arches within the host siltstone. The veins have been locally dislocated by minor gossanous fault planes. Newmont assays of 5.65, 16.46 and 12.51 g/t over widths of 0.6, 0.36 and 0.1m respectively are supported by 1.0g/t from 24.5-25.0m in drillhole M15. Drillhole M16 200m east intersected 1.35g/t Au from 23-23.5m.

Based on Newmont drilling, Aminco & Associates estimated a possible resource of 400 000 tonnes between Eudunda Hope and Jacksons (1m x 1600m x 100m) but indicated grades are very low (<1.0g/t).

Jacksons

Jacksons Mine is 1200m east of Eudunda Hope and is geologically similar being in an anticlinal arch broached by a high angle thrust or reverse fault oriented 055°/72°N. On the northern side of the fault, the stratabound lode quartz vein is 12-15cm thick whereas on the southern side it comprises 6-8 parallel glassy quartz veinlets and several narrow gossanous beds below.

Surface vein samples assayed from 0.5g/t over 10-30cm up to 2.4g/t over 1m, and Newmont drillhole M22 assayed 0.45g/t over 3.5m from 20.5-24.0m. Multiple vein sets indicate potential for bulk tonnages in zones of structural complexity.

Trojan

This prospect appears also to be on the same line of lode as Westward Ho! and at a similar stratigraphic position. The quartz vein is 15-20cm thick and comprises an intensely crenulated layer of saccharoidal quartz above glassy vein quartz and sulphide-carbonate gossan with common malachite. Recorded production was 4.5 tonnes at about 3g/t. However, a Jarmand chip channel sample over 20cm assayed 9.65g/t Au, 2.06ppm Ag, 960ppm As, 72ppm Bi, 9270ppm Cu, 1.07% Mn and 13.5% Fe similar to Westward Ho! mineralisation. An Elvire Pty

Ltd drillhole at Trojan was incorrectly collared north of the opencut workings and did not test the main S-dipping lode horizon although it did intersect quartz from 20.6-21.2 assaying 0.31g/t Au.

Birthday

This extensive group of workings extends over a strike length of 1.5km on two subparallel lines of vein quartz about 10m apart and trending 060°/66°S (southern vein) and 055°/52°S respectively in graphitic to calcareous siltstone with local limonite spotting. The southern vein is 10cm-1.4m wide and composed of white quartz and 10-40% carbonate-sulphide gossan and appears to be along the plane of a reverse fault which has dragged the adjacent calcareous siltstones into horizontal to northerly dips. A Jarmand Minerals channel sample across this vein did not record any gold but did have moderate As, Ag and trace Cu and Pb.

The northern vein is narrower at ca. 15cm and postdates/crosscuts the southern vein. It is also associated with drag folding on a reverse fault and assays 0.18g/t Au, 1.0g/t Ag, 1851ppm Ni and minor As, Cu and Pb. Primary sulphides have been recorded from deeper workings.

Three angled RAB drillholes put down by Hallmark Gold NL did not intersect any significant gold.

Aurora Australis

Approximately 600m north of Birthday, this line of old workings extends along at least three subparallel fault-controlled quartz veins oriented 060-070°; the northern and southern veins dip ca.60°N while the central vein dips ca. 60°S. The veins range from 15cm-1.8m wide, are predominantly quartz though the central vein is sulphide rich, and are within calcareous siltstone with local small chert nodules.

A 2.1 tonne sample treated by a chlorination process in 1886 produced 3.37g/t while a Jarmand Minerals composite grab sample from pyritic stockpile assayed 0.33g/t Au, 0.99g/t Ag, 123ppm Co, 637ppm Cu, 27.6% Fe and 1665ppm Ni. Rare native copper has been recorded. Three RAB holes drilled by Hallmark Gold did not intersect significant lode material.

Nectar

These small shallow workings occur within a 50cm-wide 'bucky' white quartz vein dipping 47°N with associated drag folding in adjacent siltstones; regional dip of siltstones is to south and thrust faulting is suggested. Old records indicate that gold was found in small ironstone and ferruginous quartz veins whereas the larger veins apparently contained little gold. Recorded production was 1 285gm from 23.78 tonnes.

CRA Exploration drilled a line of auger holes and three percussion holes which intersected 0.1-0.55g/t and 3.0g/t in adjacent holes at 4.0-5.0m. Hallmark Gold also encountered elevated gold up to 0.55g/t from 0-6m; all occurrences were in ferruginized material in the upper few metres.

Euro

Located in the transitional zone between the Enorama Shale and Gumbowie Arkose, this lode occurs as a shallow-dipping, stratabound, 10-15cm-wide, saccharoidal quartz vein with sulphidic gossan lenses up to 5cm wide. The upper contact of the vein is intricately folded and silicified whereas the lower contact is variable from flat to irregular. Host sediments are folded into a local anticlinal flexure and there are local near-vertical quartz veins along NE-trending fractures in the footwall.

Old assays from Euro record values of 38.9, 80.9 and 1 003g/t Au but production records show 12 tonnes of ore were treated at Peterborough for an average grade of 12g/t. A Jarmand Minerals channel sample assayed 0.35g/t Au and 2.11g/t Ag over 10cm.

Teetulpa Goldfield

Teetulpa's total estimated production is about 87 000oz (2.7 tonnes) gold from both alluvial and hard-rock workings. The field was noted for the large number of nuggets found, the largest weighing 230oz (ca. 7 000gm). Alluvial gold was found in Brady's Gully, Goslins Gully, Strawbridges Gully (near Strawbridges Dam), and tributaries NE of Tonkins Dam.

The main alluvial leads represent fossil valley stream beds slightly offset from modern drainage and many slightly higher than modern watercourses (Drew, 1992; RB92/53). Gold occured at the base of the alluvials in sandy wash from erosional gutters and pockets in bedrock. Depths varied up to 7m.

NNW-trending quartz plus siderite/silceous ironstone veins in the underlying green-grey laminated calcareous siltstone/slate (Tapley Hill Formation) were prospected and mined intermittently but did not produce substantial quantities of gold. These veins are pyritic, about 0.2-0.5m wide and crosscut easterly-trending barren veins (Forbes, 1991; OLARY Explanatory Notes).

Western Mining Corporation Ltd (Envelope 6711) carried out intensive soil and rock chip geochemical sampling and geophysics over the Teetulpa Goldfield along 400m-spaced traverses with soil sampling every 20m bulked into 40m composites. Gold anomalies were recorded around known workings and contoured data confirmed the NNW trend of the main lode system.

There is still considerable activity on the Teetulpa Goldfield and current Mining Leases and Mineral Claims total approximately 17km^2.

Royal Charlie

Mineralisation at Royal Charlie occurs within ferruginous and gossanous pyritic quartz veins in calcareous slate and sandstone of the Cox Sandstone Member similar to Waukaringa Goldfield. Besides the main reef which is concordant to bedding and dips about 46°S, there are two other veins striking E-W and SSE-NNW; the former cuts off the main reef. Recorded production shows 811gm from 68.78 tonnes at 11.8g/t and 244gm from 50.8 tonnes at 4.81g/t.

Soil sampling by WMC (Envelope 6711) near the mine was encouraging and rock chip samples have assayed up to 58g/t with accompanying high As. However, no followup work was undertaken. Hallmark Gold sampled a S-dipping dolomite unit 50m north of the mine for a strike length of 6km; best assays were 0.52-0.68g/t Au 1km E of mine.

There is a very small current Mining Lease on Royal Charlie Mine.

Other Mines/Prospects

The stratabound, mineralised quartz lode at Odd Trick Mine is located in a monoclinal flexure within upper Enorama Shale, is 10-20cm wide and traceable for 400m. Like the Euro lode horizon, the upper silicified contact of the vein with siltstone is crenulated and the lower contact is, in one pit, flat and slickenslided. A chip channel sample assayed 0.21g/t Au, 0.4g/t Ag, 351ppm As, 1494ppm Cu, 21.7% Fe, 1.04% Mn, 12.6ppm Mo and 110ppm V.

No Gammon prospect, 1km SE of Nectar, was tested by CRA Exploration along a line of auger holes and two percussion holes but despite a good 3-metre exposure of a stockwork of quartz veinlets and a 50cm-wide quartz-carbonate vein, no mineralisation was detected. A Newmont sample assayed 2.4g/t Au.

Drilling was undertaken at the Spanish American prospect on stratabound sideritic-ferruginous quartz veining (shallowly dipping to south) but other than fresh sulphide at depth no significant mineralisation was encounted (Envelope 6971).

Jackson's Pile, just west of Homeward Bound, is located on a steeply-dipping, NE-striking quartz vein 25-30cm wide and containing common malachite coatings on fractures.

At Starlight Dam, a 10-20cm-wide quartz-carbonate vein with several shallow pits along it can be traced for 600m along a strike of 260°. The vein dips 83°S as opposed to a 46°S dip for the calcareous slate.

The Nob Copper Mine 10km NE of Paratoo RS was developed on gossanous veins crosscutting Saddleworth Formation (laminated slaty siltstone; Burra Group) and reported to contain up to 50% Cu and 3g/t Au. Recent assays from ca. 30cm ferruginous quartz veins (oriented 280°/60°S) at the Nob contain up to 0.84g/t Au with 8.15% Cu (Envelope 8049) and 1.15g/t Au with 11.8% Cu (Envelope 6411).

An extensive group of workings at the Whydown Prospect (3km W of Paratoo RS) is located on a 30-40cm thick iron-manganese-siderite-pyrite quartz vein concordant within Appila Tillite close to the Appila/Tapley Hill Formation boundary. Best rock chip assay is 3.0g/t Au (Envelope 6411).

3.3 Previous Regional Exploration

During the late 1960's, early 1970's and mid-1980's, several companies have looked at the Paratoo Copper Mine 5km WNW of Paratoo RS. A diamond drillhole was drilled to 370m and over 70 percussion holes drilled in an attempt to define a copper orebody. Best assays were up to 3.05% Cu and 0.3g/t Au over 1m although one assay of 3.1g/t Au was reported

(Envelope 592). Mineralisation at Paratoo is within laminated and stromatolitic, locally brecciated Burra Group siltstone. 21 drillholes in brecciated siltstone 3km NE of the mine did not locate any gold above the detection limit of 0.5g/t.

Two parallel quartz limonite (malachite) gossans in black pyritic shale were mapped and drilled at Winnininnie Prospect by SA Barytes (Envelope 1496) for a best intersection of 3.7%Cu and 410g/t Ag at 25.9-27.4m.

Sasearch (Envelope 1555) flew detailed low-level (70m), closely-spaced (305m) aeromagnetics over the Manunda area and undertook IP at Gum Well Mine but no follow-up work.

CSR Ltd (Envelope 6340) undertook reconnaissance stream sediment sampling and located 3 anomalies >0.7g/t Au 10, 11 and 15km respectively due south of Paratoo HS but follow-up rock chip samples did not identify a source.

Regional geochemistry by Barrier Exploration NL (Envelope 4505) south and east of Nillinghoo Goldfield and by Amax Australia (Gold) Pty Ltd south of Mt Victor failed to locate any significant gold anomalies.

Utah Development Co (Envelopes 4547 and 6411) undertook detailed mapping and geochemistry in the western area south of Waukaringa. They identified 5 zones anomalous in gold around the Whydown Dome and Nob Mine workings (see above). Detailed mapping and rock chip sampling along 500m-spaced traverses in the Black Hill Anticline area over Appila Tillite located several concordant to discordant ferruginous quartz veins with minor gold anomalies but none were drilled. Drilling east of Waukaringa Goldfield did not intersect significant mineralisation. Heavy mineral samples did not contain any diamond/kimberlite indicators.

Australian Anglo American Ltd (Envelopes 6029 and 6489) undertook regional stream sediment and rock chip sampling in the Winnininnie area and south of the Barrier Highway. Three samples contained anomalous gold with one sample at the Tapley Hill Formation/Tarcowie Siltstone boundary on the western end of the Winnininnie Dome assaying 1.66g/t Au in an ironstone unit. No follow-up work was undertaken. Minor anomalies around Gum Dam prospect occur within thin (<4cm) quartz veins in an arrenaceous facies of the Tarcowie Siltstone. Shell Co of Australia (Envelope 6895) also detected BLEG anomalies around Gum Dam.

CRA Exploration Pty Ltd (Envelope 6819) concentrated on the Waukaringa and Wabricoola areas following anomalous stream-sediment gold in catchments draining Elatina Subgroup sediments between Wabricoola HS and Waddington Bluff. Follow-up rock chip samples located trace gold in a WNW zone near Yellow Dam.

Aztec Mining Co Ltd (Envelopes 8316 and 8556) carried out regional sampling and mapping and located a minor gold anomaly (up to 2.98g/t Au) on the SE limb of the Hope Bank Anticline but did not follow it up.

4.0 CONCLUSIONS

Total production from Mannahill and Teetulpa Goldfields and other smaller mines in the tenement area approaches 95 000oz (2.95 tonnes) of gold.

Historical records from Mannahill Goldfield indicate that a substantial amount of gold, probably well in excess of 100 000gm and maybe as high as 150 000gm, has been extracted from narrow ferruginous and sulphidic quartz vein systems within the Enorama Shale of late Proterozoic age. Wide-spaced drilling along the Westward Ho!-Elsie May-Eudunda Hope-Jacksons line of workings indicates the possibility of a further 1.7 million tonnes of ore at grades of up to ca. 2.5g/t over a 1m interval. However, there has been very little drilling on the field considering the extensive nature of the workings and their long strike length. For example, the Homeward Bound line of workings extends for 1.5km yet there are only two recorded drillholes into the lode horizon! Therefore, there is considerable scope for further drilling and exploration within the goldfield itself.

Estimated and recorded gold production from Teetulpa Goldfield (ca. 2.7tonnes) is much higher than from Mannahill and all other fields in the immediate area put together. However, most of that gold was won from shallow alluvial workings with only minor amounts coming from cross-cutting quartz veins in Tapley Hill Formation. The source of gold in the alluvials is a mystery.

Outside of the goldfields there has been no substantive drilling or mineral exploration other than wide-spaced regional geochemical sampling. It is likely that any substantial alluvial gold would have been identified by these programs but bedrock Telfer-style mineralisation remains a viable target.

Previous investigations have drawn heavily on comparisons with Telfer-style mineralisation emphasizing syngenetic concepts, the concordant nature of mineralised veins, the significance of host lithologies and drapes over anticlinal fold crests. However, a number of descriptions of the quartz-vein lode systems in the Mannahill Goldfield and adjoining areas have described structural features which could be attributed to development of the veins along shallowly-inclined thrusts prior to regional folding, cleavage development and recrystallisation. Veins occur at different stratigraphic positions - occuring at higher stratigraphic levels in the southern area relative to the northern area - and they often have tight crenulations and chevron folding along their upper contact with host sediments yet their lower contacts tend to be flatter and, in one instance, apparently striated. A few descriptions suggest reverse faulting or shearing associated with some of the more steeply inclined veins.

Therefore, there is a strong case for careful re-evaluation of the structural characteristics of the individual mines and, in particular, of the whole region using new aeromagnetic data combined with detailed field mapping and construction of balanced cross-sections. Detailed solid geology and structural geological maps combined with appropriate geochemical mapping would then be available as a basis for drilling and follow up exploration.

Summaries of Open File Information
Department of Mines and Energy, South Australia

Derived Originally from SAMREF Database but Extensively Updated

Mannahill. Progress and final reports from 8.10.83 to October 1984.
Tenement: EL1164;
Amax Australia (Gold) Pty Ltd;
Author(s): Bull, P F; Wyatt, D H;
Source: MESA Open File Envelope 5211 Date: 1984
Abstract:
Exploration for Telfer type Proterozoic stratabound gold included review of previous work, an aerial survey of known occurrences and reconnaissance stream sediment, soil and rock chip geochemical sampling just south of Mt Victor HS and near Outalpa, but located no economic mineralization.
Assays: Cu; Pb; Zn; Ni; Co; Bi; Cd; As; Ba; Sn; U; Th; W; Se; Rb; Sr; Sb; Ga; Ge; Fe; Mn; Ag; Mo; V; Au; Hg; Sc;
Mines: Waukaringa Mine; Ajax Mine; Mount Grainger Mine; Wadnaminga Goldfield; Teetulpa Goldfield; Mannahill Goldfield; Kings Bluff Mine; Kirkeeks Treasure Mine;
Location: Mannahill; Baratta; Boiekevie Hill; Outalpa;
Mapsheets: ORROROO; OLARY; #100=6733I; #100=6833; #100=6933II; #100=6933III; #100=6932IV;

Mannahill. Progress report from 16.10.87 to 15.1.90
Tenement: EL1436;
Hallmark Gold NL;
Author(s): O'Hara, G P;
Source: MESA Open File Envelope 6971 Date: 1990
Abstract:
TARGET: Telfer-style gold deposits in the Mannahill Goldfield.
EXPLORATION: Reconnaissance of old workings, rock chip sampling of S-dipping dolomite 50m north of Royal Charlie Mine for strike length of 6km, and RAB drilling (16 holes, totalling 440 metres).
RESULTS: No significant gold values recorded in RAB drilling programme.
Spanish American: Stratabound sideritic & ferruginous & sulphidic quartz veining at depth but no Au (though trace Bi).
Nectar: Surface ferruginous sulphidic quartz stockworks do not continue at depth and have been mined out.
Birthday: 1.5km strike length of workings in graphitic siltstone. Complex multiple quartz vein system - 2 shear controlled sulphidic quartz veins ca. 10m apart dip S at 60°.
Aurora Australis: En echelon quartz veins over 1.5km strike length. At least 3 veins - northern and southern dip 60°N and central dips 60°S. Rare native Cu.
Assays: Au; Ag; As; Cu; Bi;

Mines: Mannahill Goldfield;
Location: Mannahill; Yunta; Olary;
Mapsheets: OLARY; #100=6933; #100=6832; #100=6932; #100=6833;

Teetulpa; Wattle Dam; Mannahill. Progress and final reports from 24.3.86 to 23.12.86.
Tenements: EL1322; EL1334; EL1336;
Western Mining Corporation Ltd;
Author(s): Paterson, H L;
Source: MESA Open File Envelope 6711 Date: 1986
Abstract:
Exploration centred on the Teetulpa Goldfield comprised intensive geochemical sampling (rock chip, soil, stream sediment, battery slimes and mine dump) and IP, resistivity, Sirotem (ineffective) and ground magnetic surveys. At Teetulpa, soil sampling was undertaken on 400m-spaced lines at 20m intervals then bulked for 40m composite samples. Some significant gold values were recorded from known workings and contoured data supported the NNW trend defined by the main Teetulpa lode system. Reverse circulation percussion drilling of IP anomalies at Teetulpa, (16 holes totalling 979 metres) gave generally low gold values.
Some rock chip, stream and soil geochemistry was undertaken in Mannahill Goldfield and Royal Charlie Mine regions but not followed up. Rock chip samples (up to 58g/t Au + high As) and soil samples at Royal Charlie warrant further evaluation. Slimes at Homeward Bound range from 4.8-6.1g/t Au but volume is small.
Assays: Au; Ag; As; Bi; Te; Tl; Hg; Co; Cu; Pb; Al2O3; Ba; Be; CaO; Cd; Ce; Co; Cr; Eu; Fe2O3; Gd; K2O; La; Lu; MgO; Mn; Mo; Na2O; Nb; Nd; Ni; P; Pr; S; Sm; Sn; Sr; Th; TiO2; V; W; Y; Zn; Zr; Fe;
Mines: Teetulpa Goldfield; Mannahill Goldfield; Royal Charlie Gold Mine;
Location: Wattle Dam; Mannahill
Mapsheets: OLARY; #100=6833; #100=6933III;

Mannahill Goldfield. Progress and relinquishment reports from 8.10.83 to December 1986.
Tenement: EL1161;
Jarmand Minerals and Exploration Pty Ltd; CSR Ltd;
Author(s): Aminco and Associates Pty Ltd; Curtis, J L; Brunt, D; Herbert, J M; Seymour, D L;
Source: MESA Open File Envelope 5260 Date: 1986
Abstract:
Increase in gold reserves inferred from Newmont drilling of the Mannahill Goldfield was not substantiated. Exploration included study of all old mines and prospects, geological mapping and photogeology. Stratigraphic or structural extensions or repeats were not located. Field testing of geochemical methods including stream sediment, soil and rock chip sampling and magnetic concentrates over Westward Ho! and Homeward Bound lines of lode were inconclusive.
No substantial geochemical anomalies were identified in reconnaissance sampling. However, a model for formation of the deposits was developed. It is inferred that a precursor stromatolitic dolomite bed within the Enorama Shale developed structurally-induced permeability during folding (preferably in anticlinal or monoclinal flexures). Fluids emanating from the Teetulpa Fracture Zone initially silicified the unit and subsequently introduced the gold mineralization early during tectonism with concurrent recrystallization of the earlier replacive quartz. Siliceous zones are crenulated which has been interpretted to be of primary (pre-silicification) origin.

Mineralisation occurs at different stratigraphic levels in each of the mining areas: Westward Ho! is at the transition from lower carbonate-rich facies to upper siltstone facies, Homeward Bound and Odd Trick are higher in the siltstone facies, and Euro is at the upper contact with the Gumbowie Arkose.
Folding in the vicinity of mines is gentle along the northern limb of the Winnininnie Syncline but 400m north of Homeward Bound there is a ridge of intensely folded (tight to isoclinal) siltstone. Axial plane cleavage is strongly developed and fractures are 040-065° parallel to quartz veining (eg at Aurora Australis and Birthday). Photogeology suggests Teetulpa Fracture Zone extends down to at least Poverty Dam where there is minor ferruginous quartz veining in NNW joints.
Re-evaluation of 'unimaginative' Newmont Pty Ltd drilling data at the Westward Ho! line (including Elsie May & Eudunda Hope), gave an inferred reserve of 1.7 M tonnes ore up to 2.75g/t. Mineralisation/veining at Euro, Odd Trick, Jackson's Pile , Homeward Bound, Jackson's, Aurora Australis, Starlight Dam, Nectar and No Gammon were considered too thin or discontinuous to be prospective/economic. Trojan and Birthday were considered to be worthy of follow-up exploration (this was not undertaken).
Assays: Au; Ag; As; Bi; Cd; Ca; Ce; Cr; Cu; Fe; Mn; Mo; Ni; Pb; Sb; V; W; Zn;
Mines: Mannahill Goldfield;
Location: Florian;
Mapsheets: OLARY; #100=6832II; #100=6832III;

Report on geological investigation and drilling on SML635 Mannahill area SA.
Tenement: SML635;
Elvire Pty Ltd;
Author(s): Kennedy, T J; Minoil Services Pty Ltd
Source: MESA Open File Envelope 1833 Date: 1971
Abstract
Brief review of goldfield with emphasis on Trojan and Westward Ho! prospects. Two drillholes: Trojan TP-1 (200') intersected quartz reef at 67.5-69.5' (<0.01 oz/ton Au) and WHP-1 (175') intersected mineralised siltstone from 45-50' (0.6 oz/ton Au).
Keywords: Metalliferous minerals; Mineral exploration; Drilling; Percussion drilling; Mines; Gold deposits; Copper deposits; Geological logs; Chemical analysis; Gold; Copper; Lead; Zinc; Cobalt; Bismuth; Geophysics; EM surveys; VLF EM surveys; Adelaidean;
Mines: Westward Ho! Mine; Trojan copper prospect;
Location: Mannahill;
Mapsheets: OLARY; #100=6833;

Geological reconnaissance at Mannahill Goldfield, SA.
Tenement: MC4212;
Kingsway Minerals NL;
Author(s): Foldessy, J;
Source: MESA Open File Envelope 2778 Date: 1975
Abstract:
Geological and structural study of Homeward Bound Mine area - 2 cleavage sets 245-255° ,70-85°S (main set) and 170-190° ,60-75°E (minor). Drilling at Westward Ho! (4 DHs) intersected 0.96oz/t Au at 26.38-26.51m in WH-1 and at Homeward Bound intersected 0.6oz/t at 37.7-37.9m in HB1.

Mines: Homeward Bound Mine; Westward Ho! Mine;
Location: Mannahill;
Mapsheets: OLARY; #100=6833;

Progress reports on SML479 Mannahill, S.A.
Tenement: SML479;
Elvire Pty Ltd;
Author(s): Kopcheff, J T; Minoil Services P L;
Source: MESA Open File Envelope 1540 Date: 1971
Abstract:
30 000' of VLF identified some conductors over old mining areas. Detailed geological mapping and geophysics undertaken at Morialpa Copper Prospect and Morialpa Quartz Reef; drilling recommended but not undertaken.
Mines: Trojan copper prospect;
Location: Manna Hill; Mount Edmunds; Waronee Syncline; Morialpa;
Mapsheets: OLARY; #100=6933;

Progress & final reports EL 363(Mannahill) S.A.(2 reps, 9 figs).
Tenement: EL363;
Newmont Pty Ltd;
Author(s): Verwoerd, P J;
Source: MESA Open File Envelope 3224 Date: 1978
Abstract:
Review and detailed chip sampling and mapping of Mannahill Goldfield led to drilling program (25 rotary percussion drillholes at 200m centres along the Westward Ho! and Jackson's line of diggings). Assays >1g/tonne (and up to 8.13g/tonne for a single 0.5m sample) were intersected in 8 drillholes but were erratic. Interpretation of drill sections suggests that the mineralised quartz vein system may by slightly oblique to bedding (maybe shallower dipping to the S).
Mines: Homeward Bound Mine; Eudunda Hope Mine; Elsie May Mine; Westward Ho! Mine; Jackson Mine;
Location: Manna Hill;
Mapsheets: OLARY; #100=6833;

Appraisal of gold tailings, Westward Ho! gold mine, Mannahill Goldfield.
Author(s): Horn, C M;
Source: MESA Unpublished Report RB 87/045 Date: March 1987
Abstract:
Discovered in 1886, Westward Ho! Mine has a recorded production of 3 765.5 tonnes which yielded 34 729.48 grams of gold bullion. 4 000 tonnes were treated at a stamp battery at the mine and tailings were later cyanided.
Remaining on site is an indicated 4 900 tonnes of tailings containing 3.97 g/t Au in 3 separate stockpiles. 2 smaller stockpiles were not sampled and are not included in the estimate. Tailings also contain 1.6 g/t Ag, 845 g/t Cu, 575 g/t Pb, 470 g/t Zn and 6 510 g/t As. Cyanide leach tests on underground samples recorded poor gold extractions from 10% to 73% despite reasonably high Au content.

Assays: Au; Cu; Pb; Zn; Co; Ni; Cr; Ag; As; Cd; Bi; Ba; Mo; Ti; V; Be; Sc; Sr; Y; Zr; Nb;
Mines: Westward Ho! Gold Mine; Mannahill Goldfield;
Mapsheets: OLARY; #100=6833II;

Mount Victor area. Report on the reconnaissance exploration.
Tenement: SML488;
Property and Minerals Exploration Ltd;
Author(s): Minoil Services Pty Ltd; Kopcheff, J T;
Source: MESA Open File Envelope 1649 Date: June 1971
Abstract:
9 rock chip, mine dump, tailings, and hand auger alluvium samples were collected from abandoned gold workings. No significant assays were returned, and it was concluded the area has limited potential for either bedrock or alluvial gold. 1" to 1mile geological map.
Assays: Cu; Au; Fe;
Mines: Teetulpa Goldfield; Nillinghoo Goldfield;
Location: Mount Victor Homestead;
Mapsheets: OLARY; #100=6833I; #100=6833III; #100=6833IV;

Benda Range. Progress and final reports from 10.1.85 to 10.1.86.
Tenement: EL1268;
Australian Anglo American Searches Ltd;
Author(s): Newton Smith, J; McBride, B;
Source: MESA Open File Envelope 6029 Date: 1986
Abstract:
Exploration for stratabound gold in the Nackara Arc included stream sediment sampling (999 samples; As, Pb, Bi, Se only), and soil and rock chip sampling near Gum Dam over an area of auriferous quartz veins in an arenaceous facies of the Tarcowie Siltstone Member of the Umberatana Group. Locally auriferous quartz veins, not exceeding 40 mm in width are present throughout the unit. They are locally strike concordant but with dips opposite to the bedding (veins 240-260° ,40-75°SE; bedding 220-230° ,70-80°NW), perhaps representing infilling of tension fractures within the more competent arenaceous facies on the flank of a major anticline. Maximum assays were 15.8 and 10.6g/t Au. Stream sediments anomalous in bismuth were found to be associated with the Ulupa Siltstone but the cause of the response is unknown. Landsat interpretation identified a prominent NW-trending lineation.
Assays: As; Bi; Pb; Se; Au; Ag; Cu; Zn;
Mines: Gum Dam prospect;
Location: Tiverton;
Mapsheets: ORROROO; #100=6732I; #100=6732II; OLARY; #100=6832; #100=6932III; #100=6932IV;

Manunda. Final report for period ending October 1985.
Tenement: EL1279;
CSR Ltd;
Author(s): Brunt, D A;
Source: MESA Open File Envelope 6340, CSR rep EMR 109/85; Date: 1985
Abstract:

Reconnaissance stream sediment sampling of Umberatana and Burra Groups (220 samples) for Telfer type gold revealed 3 anomalous (>0.7g/t) gold values from the bulk samples. Analysis of magnetic concentrates revealed no useful pathfinders for gold. 2 of the marginally anomalous gold values were not reproduced in resampling, and follow up rock chip sampling (19 samples) did not result in any anomalous gold values.

Assays: Au; Cu; Ag; Pb; Zn; Ni; Co; Fe;
Location: Manunda; Nackara;
Mapsheets: ORROROO; #100=6732I; #100=6732II; OLARY; #100=6832; CHOWILLA; #100=6831I; #100=6831IV;

Paratoo. Progress and final reports from 23.2.84 to 23.2.87.
Tenement: EL1219;
Adelaide and Wallaroo Fertilizers Ltd;
Author(s): Bampton, K F; Villaroel, P;
Source: MESA Open File Envelope 5476; 4 fiche, 121 pages, 5 plans; 14 appx, 2 fig, 12 reps,
Date: 1987
Abstract:
Percussion drilling (63 holes totalling 2 895 metres) at the Paratoo Copper Mine, 20 km SW of Yunta, has defined a resource of 100 000 tonnes at less than 1% Cu. Most Au assays <0.05g/t but 2 DHs assayed anomalous gold: PT36 - 38-39m 0.30g/t Au + 3.05% Cu; PT37 - 17-18m 0.16g/t Au + 2.85% Cu. Cu-bearing quartz from southwestern pits gave 0.12g/t Au.
Assays: Cu; Au;
Mines: Paratoo Copper Mine;
Mapsheets: ORROROO; #100=6732I;

Mount Victor. Progress reports from 29.2.82 to 30.11.85.
Tenement: EL0939;
Barrier Exploration NL;
Author(s): P.J. Legge and Associates; Hunting Geology and Geophysics (Aust) Pty Ltd; Holt, G; Dawney, R L; Clavarino, J G; Pyper, R C; Legge, P J; (Code: PJL, HGG)
Source: MESA Open File Envelope 4505 Date: 1985
Abstract:
Detailed reappraisal of previous North Broken Hill Ltd and CRA Exploration Ltd drilling and exploration at Kirkeeks Treasure Mine gave favourable comparison with Telfer Gold Mine, WA. Evaluation of the potential of the Nillinghoo Goldfield included aerial photograph, Landsat and regional magnetic interpretation, soil, stream and rock chip sampling and extensive open hole drilling (70 holes, totalling 1934 metres). Significant gold intersections were recorded immediately east of Kirkeeks Treasure Mine; best values were 10 metres (34-44 metres) at 5.72 g/t and 38 metres (10-48 metres) at 1.79 g/t including 6 metres at 7.17 g/t. Regional geochemistry E and S of mine failed to locate any significant Au anomalies/extensions to orebody.
Assays: Cu; Pb; Zn; Ag; Au; As;
Mines: Nillinghoo Goldfield; Kirkeeks Treasure gold mine;
Location: Mount Victor; Koonamore;
Mapsheets: OLARY; #100=6833IV; ORROROO; #100=6733I;

Copperlinka. Partial relinquishment report for the period ending 15/4/93.
Tenement: EL1711;
Aztec Mining Co Ltd;
Author(s): Oxford Resources Pty Ltd; Greene, F F;
Source: MESA Open File Envelope 8698; 40 pages; 2 appx, 4 ref, Date: 1993
Abstract:
TARGET: Gold in the Olary area.
EXPLORATION: Geological reconnaissance and limited rock-chip and stream-sediment geochemical sampling.
RESULTS: Anomalous values were recorded near known occurrences particularly old workings 1.5km SW of Coo-ee Mine (up to 63g/t Au; up to 1.9% Pb).
Assays: Au; As; Cu; Pb; Zn; Ag;
Location: Copperlinka; Coo-ee Mine;
Mapsheets: OLARY; #100=6833; #100=6933;

Mount Misery. Progress and final reports from 30.11.81 to January 1986.
Tenement: EL0942;
Utah Development Co; Broken Hill Pty Co Ltd;
Author(s): Jarvis, D M; Pointon, T; Wright, P; Circosta, G; Mann, S T;
Source: MESA Open File Envelope 4547 Date: 1986
Abstract:
Search for easterly or southerly extensions in Umberatana Group to stratabound gold mineralization known in the Waukaringa and Ajax gold mines, included detailed geological mapping along close-spaced (500m) traverses in Black Hill Anticline area. Also included extensive associated rock chip, soil and stream sediment sampling, 5 diamond drill holes (2148 metres) and 7 percussion holes (1548 metres). Following encouraging assay results for gold from stream sediment samples from areas underlain by the Appila Tillite in the Black Hill Anticline, the search target became orientated towards a placer type deposit. The gold predominantly occurs within concordant to discordant ferruginous quartz veins which tend to be common toward the centre of the anticline, probably formed by mobilization of hydrothermal fluids during the Delamerian Orogeny.
33 heavy mineral and 17 loam samples were collected to test the kimberlitic potential but tested negative.
Assays: Cu; Pb; Zn; Bi; Mn; Ag; Au; As; Ba; Sb; W; B; K; Fe; Co;
Mines: Alma gold mine; Alma Extended gold mine; Victoria gold mine;
Location: Mount Misery south and east of Waukaringa Goldfield;
Mapsheets: ORROROO; #100=6733II; #100=6733III; #100=6732I; #100=6732IV; OLARY; #100=6833III;

Paratoo. Progress reports for the period 1/6/88 to 30/2/90.
Tenement: EL1470;
Yunta Gold Pty Ltd; Mount Street Securities Ltd; Fairview Gold Pty Ltd; Empire Mines NL;
Author(s): Rich, J; Curtis, J L; Greene, F F;
Source: MESA Open File Envelope 8049 Date: 1990
Abstract:
TARGET: Gold and copper within Adelaidean units of the Nackara Arc.

EXPLORATION: Detailed geological reconnaissance, data review and re-evaluation of Paratoo
Copper Prospect and Whydown Dome. Minor rock chip geochemistry of quartz veins.
RESULTS: Inconclusive, no follow-up undertaken though follow-up drilling recommended for Paratoo Copper Mine. Several previously unrecorded small copper mine workings were located. Minor gold anomalies (up to 0.84g/t Au and 8.15% Cu) at Nob Copper Mine and along strike thereof.
Assays: Cu; Ag; Au; As; Pb; Zn; Sn; W;
Mines: Nob copper mine; Paratoo copper prospect;
Location: Paratoo; Dare Hill; Oak Park;
Mapsheets: ORRoROO; #100=6632I; #100=6732I; #100=6732IV; #100=6733II; OLARY; #100=6832IV; #100=6833III;

Winnininnie. Progress reports from 6.9.85 to 6.3.86.
Tenement: EL1302;
Australian Anglo American Searches Ltd;
Author(s): McBride B;
Source: MESA Open File Envelope 6489 Date: 1986
Includes: Thynne, D; Commercial Minerals Pty Ltd; 1985. Winnininnie Dome, Winnininnie Barite Deposit. Appx. 3 in prog. rep. to 6.12.85.
Abstract:
Exploration for stratabound gold in basal Tarcowie Siltstone east of Yunta comprised stream sediment and rock chip sampling. Anomalous copper, arsenic and gold values were recorded in ironstone units and at Tapley Hill Fmn/Tarcowie Siltstone boundary of Winnininnie Dome (up to 1.66g/t Au). A separate geological appraisal downgraded the Winnininnie barite deposit.
Assays: Au; Ag; As; Bi; Cu; Pb; Zn; Se; BaSO4; SrSO4; SiO2; FeO; Fe2O3;
Mapsheets: OLARY; #100=6832I; #100=6832IV; #100=6833II; #100=6833III; #100=6933III; #100=6932IV;

Benda Range. Progress reports from 28.4.87 to 28.10.87.
Tenement: EL1396;
Shell Co of Australia Ltd; Tri-Arc Energy Ltd;
Author(s): Prowse, C K;
Source: MESA Open File Envelope 6895 Date: 1987
Abstract:
TARGET: Cross cutting gold mineralized quartz reefs / veining primarily in the Tarcowie Siltstone; gold in known mineralized zones in the Saddleworth Formation; and circular features as outlined from Landsat interpretation.
EXPLORATION: Rock chip and BLEG (bulk leach extractable gold; 16 samples) stream sediment sampling in Gum Well and Scobie Hill mine areas.
RESULTS: Minor BLEG anomalies around Gum Dam (SW of Oulina HS).
Assays: Au; Ag; As; Cu; Pb; Zn;
Mines: Gum Dam Mine
Location: Benda Range;
Mapsheets: OLARY; #100=6832;

Nackara. Partial relinquishment report for the period ending January 1986.
Tenement: EL1250;
Utah Development Co;
Author(s): Mann, S T;
Source: MESA Open File Envelope 6411 Date: 1986
Abstract:
Exploration was for Telfer style stratabound gold at the contact between Tapley Hill Formation and Tarcowie Siltstone and for placer type gold in Appila Tillite and Wilyerpa Formation (94 stream sediment, 28 rock chip samples and mine sampling). 5 anomalous gold zones were defined in the Whydown/West Nob region. Samples from West Nob Mine area had up to 11.8% Cu + up to 1.15g/t Au in quartz-siderite-Fe breccia. From Whydown area, there were several assays >1g/t Au (up to 3g/t Au in 30-40cm quartz vein close to Tapley Hill Fmn/Appila Tillite boundary) and a sample rom Robertson Mine assayed).88g/t Au + 1.3% Cu. The kimberlite potential was tested by 29 heavy mineral stream sediment and 8 soil samples; results show that surrendered area is unprospective for diamonds.
Assays: Au; Cu; Pb; Zn; Ni; Co; Cr; As; Ni; Zr; Ce; La; Ba;
Mines: Robertson's Mine; Nob Mine; Whydown prospect; Paratoo Copper Mine; Nackara Reward;
Wheal Bassett;
Mapsheets: ORROROO; #100=6732; OLARY; #100=6832IV;

Minburra. Progress reports for the period 23/11/90 to 22/11/91.
Tenement: EL1690;
Aztec Mining Co Ltd;
Author(s): Greene, F F; Humberston, R L; Remote Sensing and Geological Services; Davies,H;
Source: MESA Open File Envelope 8316 Date: 1991
Abstract:
TARGET: Gold and base metals in the Belton-Paratoo area NE of Orroroo.
EXPLORATION: Reconnaissance geological mapping and rock chip geochemical sampling of areas
identified by remote sensing (thematic mapping).
RESULTS: Minor Au anomaly (up to 2.98g/t Au) on SE limb of Hope Bank Anticline. Lineament map produced from Landsat TM interpretation. No follow-up was deemed to be warranted.
Assays: Au; As ;Cu; Pb; Zn; Ag;
Location: Minburra; Paratoo; Flinders Ranges;
Mapsheets: ORROROO; #100=6632; #100=6633; #100=6732; #100=6733;

Arkarula. Progress and final reports for the period 21/7/91 to 21/7/92.
Tenement: EL1734;
Aztec Mining Co Ltd;
Author(s): Greene, F F; Coggon, J H;
Source: MESA Open File Envelope 8556 Date: 1992
Abstract:
TARGET: Alluvial gold in concealed palaeochannels immediately north of Teetulpa Goldfield, 40 km north of Yunta.

EXPLORATION: A literature review, reconnaissance geological mapping, geochemical sampling
(rock chip, soil and stream sediment) and ground magnetic traversing. Follow-up geophysical studies were recommended but not undertaken. Minor geochemical anomalies around Teetulpa workings.
Assays: Au; Pt; Pd; As; Cu; Pb; Zn; Ag; Co; Ni; Mo; Bi; Cr; Cd; V; Sn; W; Sb;
Location: Arkarula;
Mapsheets: OLARY; #100=6833;

Progress reports - Paratoo examination SA.
Tenement: SML088;
Kennecott Exploration (Australia) Pty Ltd;
Author(s): Halliday, A L;
Source: MESA Open File Envelope 592 Date: 1966
Abstract:
Extensive soil sampling (479 auger holes and trenching) in the Paratoo Copper Mine area outlined several anomalous (in Cu) areas. 5 percussion DHs - BH4 produced a 175ft zone (75-250ft) averaging 0.41% Cu; BH2 had 0.10 oz/long ton Au; and BH1 had 0.07 oz/long ton Au. One diamond cored DH to 722ft encountered low Cu grades and was still in oxidised zone at bottom. Geophysics included Electrical and IP surveys
Assays: Copper; Silver; Cobalt; Lead; Zinc; Nickel; Gold;
Mines: Paratoo Copper Mine;
Mapsheets: ORROROO; #100=6732I;

Progress and final reports(3) SML126 Paratoo examination S.A.
Tenement: SML126;
Kennecott Exploration;
Author(s): Halliday, A L;
Source: MESA Open File Envelope 681 Date: 1967
Abstract:
Deepened Paratoo DDH-1 (see Env. 592) to 1214ft. Best assay = 0.21% Cu from 880-890ft and local native copper. 5 additional percussion holes.
Mines: Paratoo Copper Mine;
Location: Paratoo;
Mapsheets: ORROROO; #100=6732;

Progress and final reports on SML272 Paratoo area SA.
Tenement: SML272;
Union Oil Development Corporation;
Author(s): Pickhard, P H;
Source: MESA Open File Envelope 1112 Date: 1970
Abstract:
Very good detailed geological map of Paratoo region and, in particular, of NE extent of 'diapiric' breccia (3km NE of Paratoo Copper Mine). 21 rotary DHs (some with bottom-hole core) in breccia body - only 2 assayed for Au (<0.5g/t Au). Max. Cu 890g/t. No further work warranted.

Location: Paratoo; Paratoo Diapir;
Mapsheets: ORROROO; #100=6732;

Geological report on SML523 Manunda area SA.
Tenement: SML523;
Sasearch Pty Ltd;
Author(s): Iredale, J A; Shackleton, W G; Webb, J E; Austral Exploration Services Pty Ltd
Source: MESA Open File Envelope 1555 Date: 1971
Abstract:
IP anomalies identified at Gum Well Mine (located 4 500ft NNW of Manunda HS) and a minor anomaly at Pidgeon Box prospect. Flew detailed low level aeromagnetic survey and produced contour maps. No follow up work undertaken.
Mines: Gum Well Mine; Pidgeon Box prospect;
Location: Manunda;
Mapsheets: OLARY; #100=6832;

Investigation of the Kirkeek's Treaure Mine, Koonamore Station, near Yunta SA.
Tenement: ML4106;
North Broken Hill Ltd;
Author(s): King, A G;
Source: MESA Open File Envelope 2469 Date: 1974
Abstract:
Investigation restricted to mine area only. One diamond DH to 350ft but no encouraging assays.
Mines: Kirkeek's Treasure Mine; Nillinghoo Goldfield;
Location: Mount Victor; Koonamore;
Mapsheets: OLARY; #100=6833;

Final report on SML484 Winninninnie area(cyl.1496/1-transp"s).
Tenement: SML484;
S.A. Barytes;
Author(s): Reid, R B;
Source: MESA Open File Envelope 1496 Date: 1971
Abstract:
Focused exploration on 2 parallel quartz limonite (± malachite) gossans 500ft long, 1-2ft thick and dipping 50°S in black pyritic shale. Surface geochemistry up to 2.1% Cu + 900g/t Ag (no Au assays) and drilling (13 percussion DHs) 3.7% Cu + 410g/t Ag over 5ft. No further work.
Mines: Winninnie barite deposit;
Mapsheets: OLARY; #100=6832;

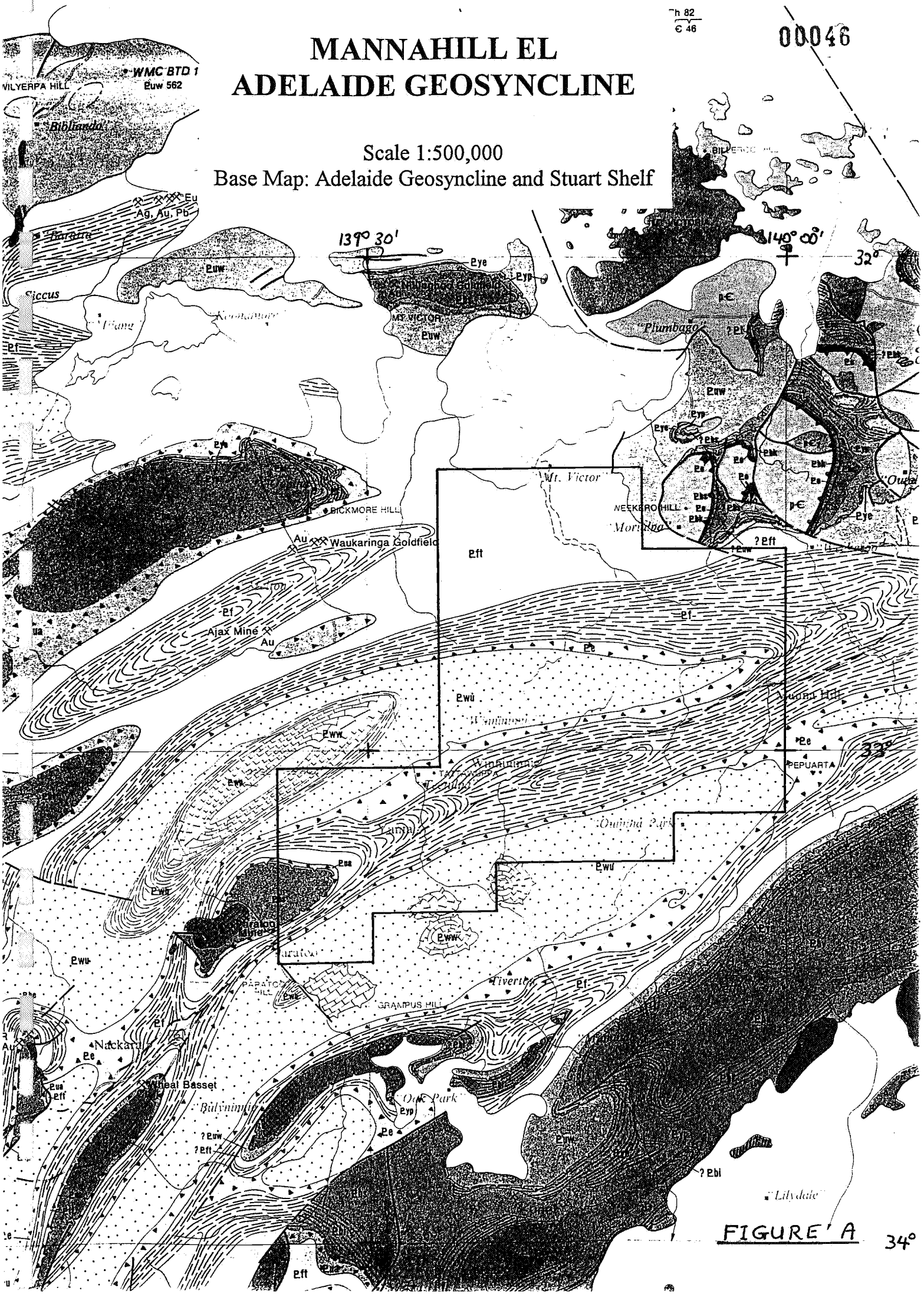
Progress & final reports el 584 Mt Victor S.A. (2 vols, 4 reps).
Tenement: EL0584;
CRA Exploration Ltd;
Author(s): Mayer, T E;
Source: MESA Open File Envelope 3847 Date: 1981

Abstract:
Detailed mapping, geochemistry and ground magnetics at Kirkeeks Treasure Mine (nb ground mag. of no value). 4 diamond DHs ans 77 percussion DHs failed to define either a shallow or deep ore zone immediatel east of main open cut.. Gold assays were generally low and were erratic. Best assays were: average 3.81g/t Au from 4-7m and 1.0g/t Au from 19-35m in 80KTD2 (including 1m @ 4.45g/t Au). Poor correlation with surface geochemistry. Following these disappointing results no further work was undertaken in the region.
Mines: Kirkeeks Treasure Mine; Nillinghoo Goldfield;
Location: Mount Victor;
Mapsheets: ORROROO; OLARY; #100=6733; #100=6833;

Terowie. Progress reports for the period 17/5/79 to 16/9/81.
Tenement: EL477;
Western Queen (SA) Pty Ltd; Pacific Exploration Consultants Pty Ltd; Labtech Pty Ltd;
Author(s): Gates, A H; Sas, Z; Esterle, J; Carson, M;
Source: MESA Open File Envelope 3612 Date: 1981
Abstract:
366 regional gravel and geochemical samples + followup loam sampling (102 samples) in selected areas (no assays for loam samples presented). No obvious diamond or kimberlitic indicators. Up to 8.8g/t Au (+ high Co) at Terowie Prospect in gossanous quartz stringers parallel to axial planar cleavage of anticline. 106 rock chip samples at Terowie prospect and 3 diamond DHs but no gold.
Assays: Ag, Co, Cr, Cu, Pb, Zn, Mo, Sr, As, W, Zr, Y, Ti, Ni, Ta, Li, Mn, Nb, U, La;
Location: Terowie; Boiekevie Hill;
Mapsheets: ORROROO; OLARY; BURRA; CHOWILLA; #100=6732; #100=6832III; #100=6731I; #100=6831IV;

MANNAHILL EL
ADELAIDE GEOSYNCLINE

Scale 1:500,000
Base Map: Adelaide Geosyncline and Stuart Shelf



139°47'

139°55'

32°19'

32°25'

Pu

Qrt

Starlight Dam

Well

VERMIN PROOF FENCE

Qra

Yds.

Back Dam

Aurora Australis

Roberts

Birthday

Elsie May

Eudunda Hope

Jacksons

Trojan

Nectar

Westward Ho!

ML 5144

Qpt

No Gammon

Homeward Bound

Mannchill 7M

Jackson Pile

Dam

Odd Trick

Euro

Pwu

PROOF FENCE

BEDDING

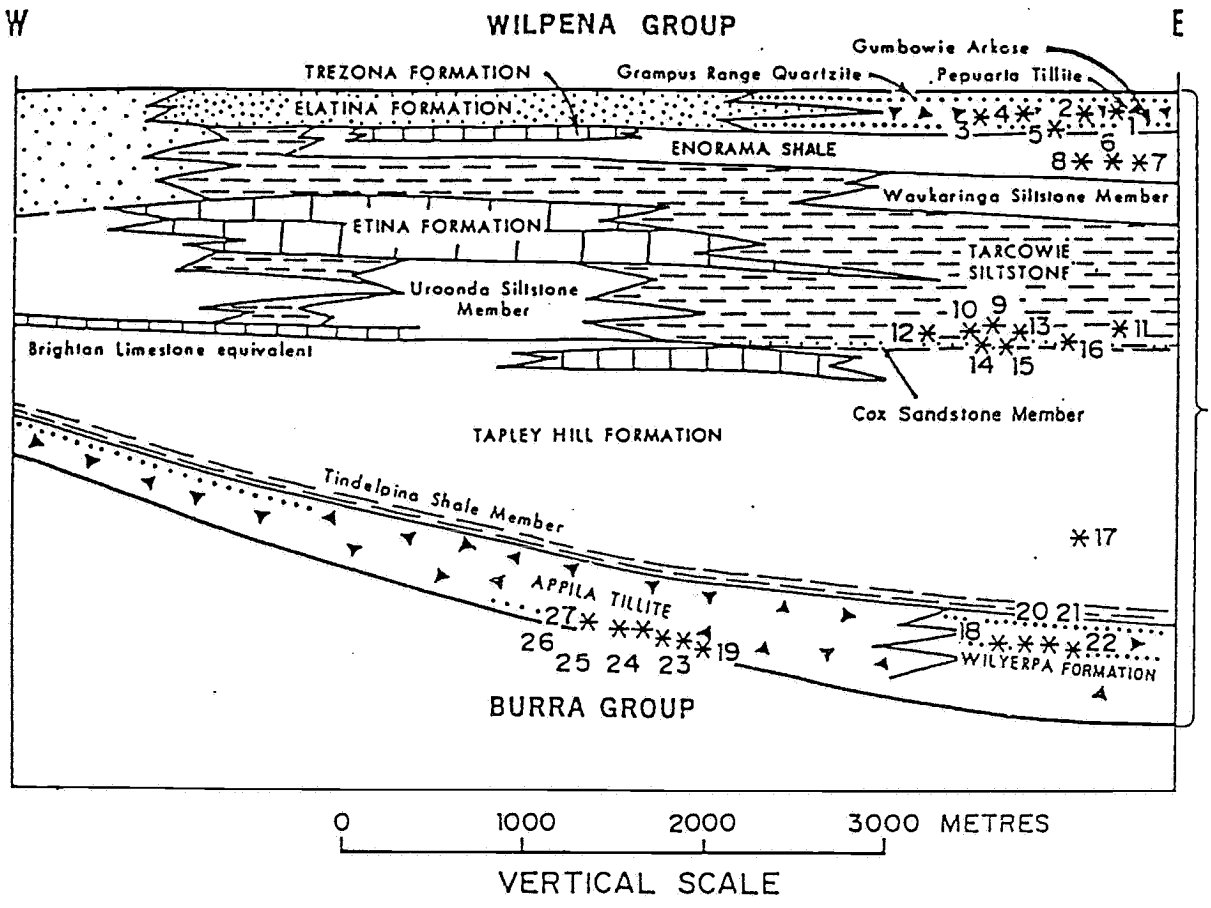
CLEAVAGE

GOLD MINE WITH LINE OF WORKINGS

0 1 2 3 km

Figure B

00047

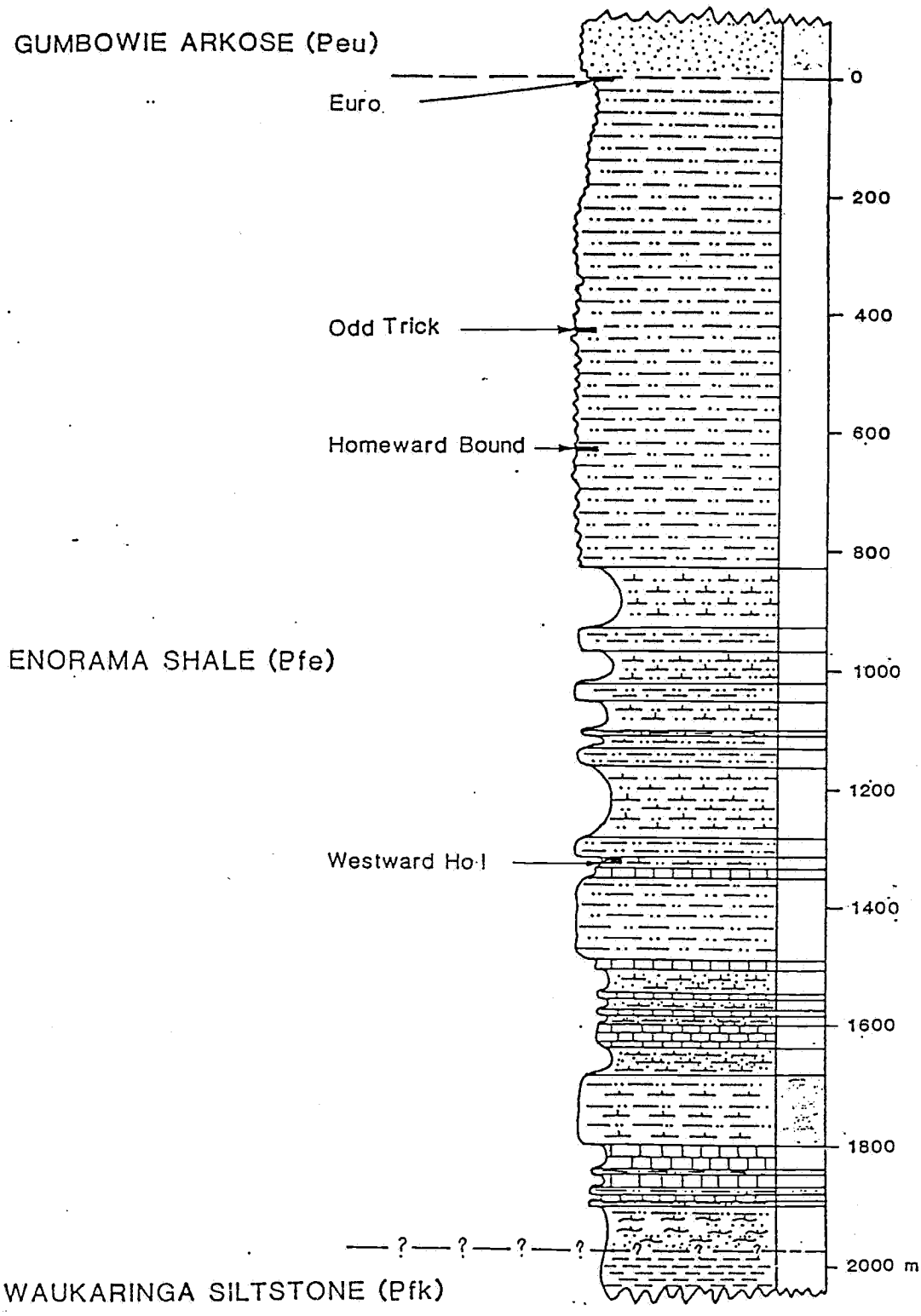


1 Copperlinka Mine
2 Ley's Mine
3 Only A Dream/Eastern Claim Mines
4 Pitcairn Range Gold Field
5 Dustholes Gold Field
6 Boomerang/Coo-ee Mines
7 Golden Dewdrop Mine
8 Mannahill Gold Field
9 Robertsons Mine
10 Aureous Line Mines
11 Eringa/Eringa South Mines
12 Eukaby Hill Mineral Field
13 Ajax Mine
14 Royal Charlie Mine
15 Mongolata Gold Field
16 Waukaringa Gold Field
17 Teetulpa Gold Field
18 Bumbumbie Hill Mine
19 Hennigs Mine
20 Kings Bluff Gold Field
21 Nillinghoo Gold Field
22 Orama Hill Mine
23 Mount Grainger Gold Field
24 Terowie
25 Wonna Gold Field
26 Black Hill Claims
27 Moneo Ridge

FIGURE C

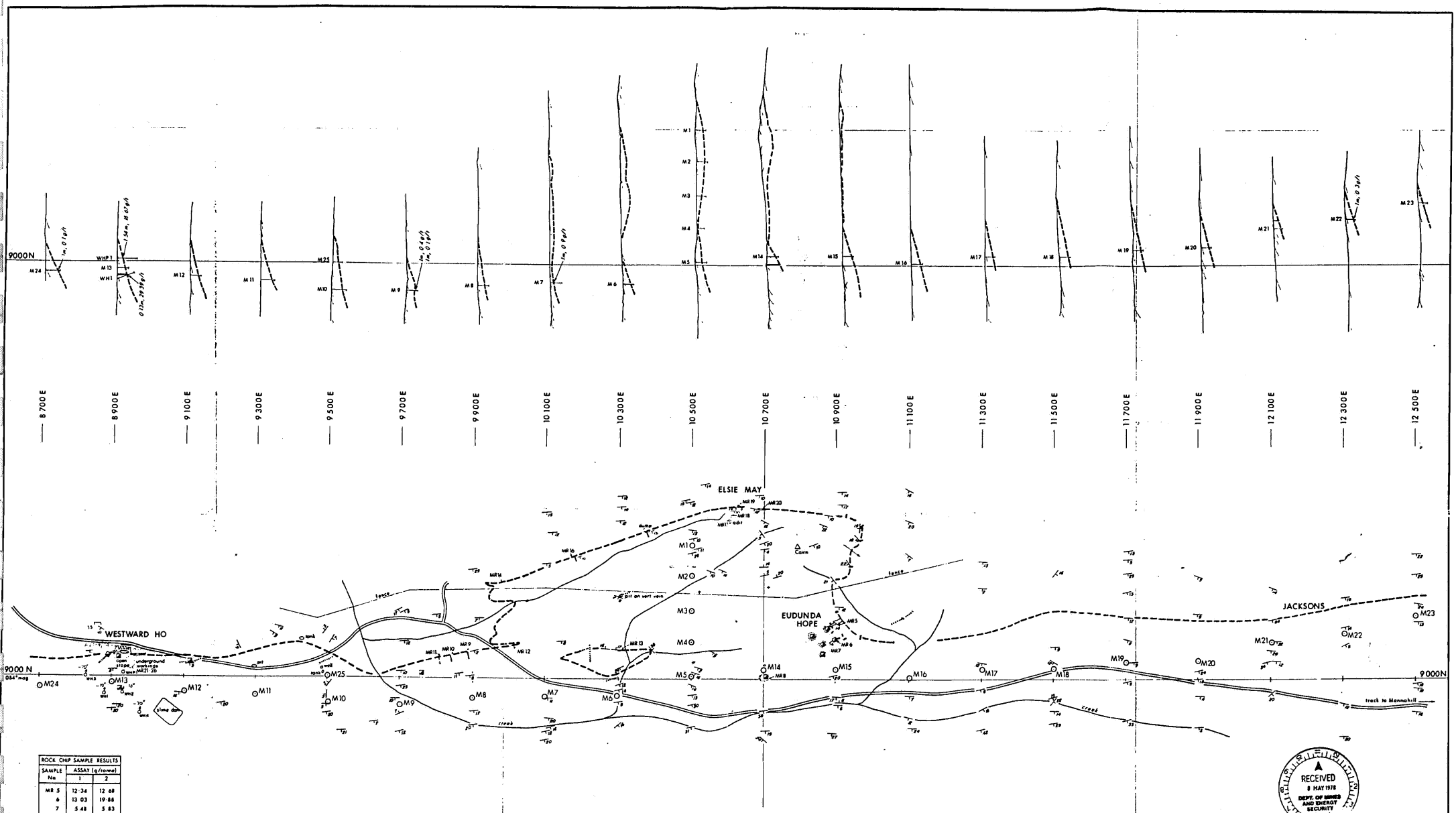
DEPARTMENT OF MINES AND ENERGY SOUTH AUSTRALIA	COMPILED B. Morris	19.4.89 C.D.O. DATE
GOLD MINERALISATION-NACKARA ARC	DRAWN L.W.	SCALE
DISTRIBUTION OF GOLD DEPOSITS IN THE UMBERATANA GROUP	DATE APRIL '89	PLAN NUMBER S 20740
	CHECKED	

4806



(Scale 1: 10,000)

Figure D: Columnar Section of Enorama Shale



ROCK CHIP SAMPLE RESULTS		
SAMPLE No	ASSAY (g/tonne) 1	2
MR 5	12·34	12 68
6	13 03	19·88
7	5 48	5 83
8	0 69	0 69
9	4 11	5·14
10	0 34	1 03
11	0 69	0 34
12	0 17	0 17
13	1·03	1·37
14	1·03	0·69
15	2 76	4 11
16	0 69	3 43
17	2 40	3·08
18	2·40	2·06
19	4 11	4·11
20	0 34	0·17
21	<0 17	<0·17
22	3·43	3·77
23	1·71	2·06
24	3·08	2·74
25	1·71	2·40
26	1·03	1 37

REFERENCE

- M15 ⊙ Newmont Pty Ltd percussion drill hole
- WHP1 ● Elvire percussion drill hole
- WH4 Kingsway Minerals diamond drill hole
- MR20 Rock sample location
- Strike and dip of bedding
- \+ Flat bedding
- Shaft, costean, pit
- Outcrop of lode
- Cross cutting veins

RECEIVED 8 MAY 1978 DEPT. OF MINES AND ENERGY SECURITY 3224

0 50 100 200 300 400 500 metres

MESA Envelope: 3224-2

NEWMONT PROPRIETARY LTD.

PROJECT MANNAHILL E.L. 363

TITLE WESTWARD HO - JACKSONS GEOLOGY & CROSS SECTIONS

SURVEY	SCALE	PLAN No.	FIG
D. Wright	1:10000	S23-12	9
DRAWN D. Brame	DATE April 1978		

A1

FIGURE E

00050

APPENDIX 3

PREVIOUS EXPLORATION SUMMARY
RED HILL - WAUKARINGA REGION

Previous Exploration in the Red Hill - Waukaringa Region. Adelaide Fold Belt, South Australia

Authors

J. McIntyre BSc (Hons)

C. S. Tomich BSc (Hons)

This report was first compiled by J McIntyre in 1994 and modified by C. S. Tomich in 1995

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CONTENTS

1.0 INTRODUCTION

This document is a summary of previous gold and/or copper exploration reported in the Red Hill - Waukaringa Region of the Adelaide Fold Belt, South Australia. Data has been drawn principally from SADME Open File databases (indexed in the SAMREF Database) but includes related Mines Department reports and documents.

Data recorded includes descriptions of gold and/or copper exploration only.

2.0 BATTLE MOUNTAIN (AUSTRALIA) - WAUKARINGA PROJECT

Source: Hextall, C.A., 1988. SADME Envelope 6894

2.1 Tenements

Tenement EL1408 was aquired in 1986 covering the region surrounding Waukaringa (but not including areas immediately adjacent to the Waukaringa Mines, Lovely Gully, or Ajax, already under title to Nixon Investments) to explore for Waukaringa style mineralization. A surrender was lodged in Oct. 1988.

2.2 Exploration Program

Exploration included:

- 378 stream sediment samples were collected at a nominal spacing of one per 1km^2 throughout the tenement; samples consisted of pan concentrate of -80# from trapsites; assayed for Au, Pt, Pd by fire assay; follow up sampling of all drainages was completed at the Moneo Ridge and Osborne Park prospects.
- regional float and rockchip sampling; 379 samples assayed for Au, Ag, Cu, As.
- soil sampling at Round Hill Bore; 51 samples of 2m deep soil auger collected along 8 traverses; pan concentrate of -80# fire assayed for Au; also separate Cu + As analysis.
- ground magnetic surveys at the Moneo Ridge and Osborne Park prospects.
- semi-regional interpretation of aeromagnetic and gravity data by consultant geophysicist Graham Elliot.
- detailed mapping at 1:1000 scale, plus rock chip sampling, at Moneo Ridge and Osborne Park .
- petrographic description of 2 samples from Moneo Ridge.
- RAB drilling at Moneo Ridge (7 holes for 288m) and Round Hill Bore (23 holes for 995m), testing geochemical and/or geophysical anomalies.

2.3 Discussion

Eight anomalies were defined by stream sediment sampling and 4 by rock chip sampling;

- Moneo Ridge: a line of old workings extends 750m along a resistant sandstone ridge in tillitic siltstone and shale; rockchip sampling located significant gold values (2 samples with visible Au) including 31 samples averaging 5.00 ppm Au (10m strike), 11 samples averaging 5.78 ppm Au (10m strike), and 4 samples averaging 5.59 ppm Au (10m strike); narrow gold bearing quartz-sulphide and gossanous veins trending 200° are hosted in a 310° trending sandstone ridge; veins range from a few mm to 12cm thick, averaging 5cm, and have a density of up to 5 veins/m; a second vein set trends 090°; RAB drilling (designed to test the 200° trending veins) intercepted 2m @ 0.97g/t Au (6-8m in MR1), 2m @ 2.06g/t Au (8-10m in MR3), 2m @ 2.69g/t Au (16-18m in MR5), and 2m @ 0.54g/t Au (18-20m in MR7
- Osborne Park: zone of old alluvial workings and small hard rock workings were located through followup of stream anomalies; initial rock chipping returned assays up to 1.13 ppm Au but infill sampling returned low assays (<0.07 ppm Au); mineralization occurs in thin quartz veins cross cutting sandstone and siltstone units; the veins were considered to be of too low density to host a significant gold resource, and no further work was undertaken.
- Bewley Hill: anomalism probably sourced from the Bewley Copper workings and gossanous quartz veins outcropping at the Tapley Hill Formation / Tindelpina Shale Member contact; low assay results (max 0.07 ppm Au); no further work was completed.
- Waukaringa North: narrow quartz-limonite veins were located in outcrop, but not considered of sufficient size or density to warrant followup work; max assay of 0.2 ppm Au in scree.
- Waukaringa South: No definite source to the anomaly was located, and was considered to result from contamination from the nearby Waukaringa Mines.
- Misery Creek: No source areas identified and no further work undertaken.
- Round Hill Bore: one gold anomaly was reported from a broad alluvial wash area; soil sampling (max. 6.87ppm Au, ave. 0.31 ppm Au) located a linear anomaly, but RAB drilling (23 holes) returned no assays above 0.5 ppm Au; large buried diapir or intrusion interpreted from aeromagnetics, possibly reflected by dislocation of Holowilena Ironstone; no further work was undertaken.
- Wyranie Hills: visible Au in several stream heavy mineral concentrates; follow up prospecting located several shallow pits up to 100m strike in Appila Tillites; pits contain ferruginous and gossanous material, with minor sericite and no quartz; max assays of 1.73 ppm Au, 7300 ppm As, and low Cu and Ag; anomaly not adequately explained, but source may be narrow quartz-ironstone veins and matrix related detrital Au in tillites.

Other anomalies located during regional mapping, prospecting, and rock chip sampling include;

- DF-I Workings; old working of highly gossanous siltstone and minor quartz-gossan veining in prominent ridge of quartzite just north of Round Hill Dam; approx 10t of gossan quarried; 2 fine flecks of Au in dollied dump material; rock chip sampling returned 0.15-4.88 ppm Au, 37-140 ppm As, 0.50-2.50 ppm Ag, 220-900 ppm Cu.
- DF-II Workings; NE/SW trending zone of workings up to 1km long; quartz-gossan veining with minor malachite and disseminated limonite (ex-pyrite) in Fe rich siltstone dump and shaft spoils; max assays of 0.61 ppm Au, 10 ppm Ag, 1050 ppm As, 3.25% Cu.
- Ajax Extended; the inferred western strike extension of the Ajax Mine; results included 26.2 ppm Au and 2.6 ppm Au from gossanous quartz veins in altered siltstone.
- Salt Well Dam; quartz-gossan veins in old workings returned low results.

2.4 Conclusions

BMA located extensive gold anomalism in stream samples. Followup work in almost all cases led to sources comprising arrays of discordant to concordant narrow quartz-sulphide and gossan veins.

Work at Moneo Ridge indicates that lithology plays a strong control on localizing veins, with sandstone units acting as brittle hosts for veining. The combination of structural and lithological control on vein geometries leads to complex vein arrays that need to be understood before accurate assessment of the potential of the system can be completed.

Further assessment of the sources of the stream anomalies, and other anomalous areas, will require a better understanding of the structural controls on mineralization. Note that although the heavy mineral sampling technique delineated many anomalies, several areas were not highlighted (and areas of minor mineralization emphasised), a byproduct of the sampling technique. A more consistent technique would be to use BLEG sampling of large samples of active stream sediments.

Reassessment of many of the stream anomalies and hardrock mineralization is warranted.

3.0 BATTLE MOUNTAIN (AUSTRALIA) - ERINA PROJECT

Source: Hextall, C.A., SADME Envelope 6926

3.1 Tenements

The Erina Project comprises EL1418 which was explored in 1987.

3.2 Exploration Program

Exploration comprised:

-stream sediment sampling, assaying 82 heavy mineral concentrates;
-soil sampling; and
-rockchip sampling.

3.3 Discussion

Reconnaissance work located a 1km long quartz vein with abundant limonitic boxworks and malachite staining. The vein dips moderately north, cutting stratigraphy at about 10°, and is hosted in the base of the Tarcowie Siltstone. Rockchip sampling of the vein produced a maximum Au value of 0.32ppm Au. Several other veins with similar orientations were located within the tenement. The vein is apparently along strike from a marked working, "Helene Shaft", approximately 1km due west.

Stream sampling highlighted a zone 7km long parallel to the main vein, with visible gold in samples draining from the central vein.

BMA considered the low grade rockchip values the source of the large stream anomaly and no further work was done.

3.4 Conclusions

BMA located a slightly discordant, extensive mineralized quartz vein within EL 1418.

BMA's negative response was based principally on the results of surface rockchip values, from oxidized and gossanous samples. No fresh material has been sampled. The size of the vein indicates a large system is developed, with potential for large tonnages and possibly high grade pods, which have not been adequately tested. Further work is required.

4.0 CRA EXPLORATION - HOPE BANK PROJECT
Source: SADME Envelope 6819

4.1 Tenements

CRAE explored the Hope Bank tenement, EL1376, straddling the southwestern end of the Mannahill tenement from Jan. 1987 to July 1988.

4.2 Exploration

Exploration included stream sediment sampling for Au, Pb, Zn, Cu and As. No significant Au or As values were reported. Anomalous Pb, Zn and Cu is believed to be sourced from lateritic ironstone accumulations overlying Appila Tillite.

5.0 CONCLUSIONS AND RECOMMENDATIONS

Previous exploration has focussed on locating stratabound mineralization generally occurring at the contact between the Tarcowie Siltstone and Tapley Hill Formation, with regional stream sampling (principally heavy mineral concentrates) used to locate similar styles of mineralization on the broader scale.

The regional stream sampling has produced a large number of anomalies, most sourced by areas of prospecting pits or scratchings on hardrock mineralization at a range of stratigraphic levels. These workings are on arrays or sets of veins of quartz and iron oxide after sulphide, generally regarded as too low density to produce significant mineralization, although locally the grade of the veins is very high.

Mineralization is clearly epigenetic, commonly discordant, and has a strong lithological control, with sandstone units providing the best host (being structurally competant). Significant potential exists to locate mineralization through reinterpretation of the existing data and prospects using a structurally controlled epigenetic model for mineralization.

On a cautionary note, the regional stream database comprises principally heavy mineral concentrates from trap sites in streams. While this has successfully identified several hardrock sources, the sample is effectively a measure of trapsite efficiency, and subject to ambiguity. This database should be interpreted with care, and where required, further regional sampling be conducted with the BLEG method, using large samples of active stream sediment.

APPENDIX 4

AEROMAGNETIC INTERPRETATION REPORT

ADELAIDE FOLD BELT - SOUTH AUSTRALIA AEROMAGNETICS INTERPRETATION AND EXPLORATION TARGETING IN THE WAUKARINGA REGION
(modified)

Report on interpretation of SAEI and Equinox-MESA Aeromagnetics and the Implications for Exploration in the Waukaringa, Red Hill, and Manna Hill areas - April 1995

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1.0 INTRODUCTION

The Waukaringa Joint Venture tenements (ELs 1901,1902, and 1963) and the contiguous Manna Hill and Red Hill licence areas (ELs 1961 and 1962) lie to the north of the township of Burra, and encircle the township of Yunta in largely pastoral areas of eastern South Australia. The project is centred on the Waukaringa and Manna Hill Goldfields occurring in Neoproterozoic sedimentary rocks of the Adelaide Fold Belt.

1.1 History

Eagle Bay Resources initially offered the Waukaringa Goldfield licence areas (EL's 1901 and 1902) for joint venture to Equinox in the latter part of 1993. Equinox entered into a Joint Venture with Eagle Bay and applied for adjacent areas encompassing the Manna Hill Goldfield to the east and potentially prospective Neoproterozoic Telfer type target areas to the north and south of the Waukaringa Joint Venture for inclusion in a Prospectus for Equinox's public capital raising.

After listing and granting of tenements, Equinox sought to fly aeromagnetics over those parts of the region not already covered by the South Australian Government's Exploration Initiative (SAEI) flying, or by older detailed open-file surveys (ie. Paratoo and Koonamore 1:100,000 sheet areas). Agreement was subsequently reached with Mines and Energy South Australia (MESA) to collaborate on flying these new areas under the SA Exploration Initiative.

Almost continuous medium resolution magnetic (400m line spacing) data of moderate to high quality is now available around the Nackara Arc, providing the opportunity to develop valuable insights into the geological structure and mineralisation controls in the area of interest. Nonetheless, it must be emphasised that the effective resolution of 400 m aeromagnetic surveys is coarse relative to the scale of sedimentary layering and many of the structures hosting mineralisation.

Throughout this report use of the adjective "bedded" indicates that a structure, vein or thrust, is confined to a particular stratigraphic horizon or at least contained within a very narrow stratigraphic interval within the area of immediate concern.

2.0 METHODS

Adequate outcrop exists in the region for the distribution of lithologies and stratigraphic units to be well understood. In addition, the relationship between mineralisation and geological structure has been well established in field work preceding the interpretation of the aeromagnetics. The attentions of this final compilation process have therefore been focussed of the structural trends and truncations that are discernible from the magnetic imagery and producing a structural summary map that is geologically sustainable.

Interpretation techniques more commonly applied by Equinox Resources personnel, revolving around the careful tracing of magnetic unit contacts from which detailed solid geology maps are derived that are structurally and stratigraphically consistent, have not been applied. The adopted approach of tracing trends and truncations is generally a much faster process, and should generally only be applied (as in this terrane) where sound gross structural and stratigraphic control can be derived from existing mapping.

In many areas, especially in broader fold hinges where primary layering has very shallow dips, the geometries and structures can not be resolved by the aeromagnetics. Joint sets, swarms of dykes, quartz veins, and other features with regular patterns tend to swamp any subtle features that might otherwise have been visible in such areas.

3.0 GEOLOGY

The geological structure of the region in question has proven to be much more complex and discontinuous than currently available Government regional mapping would indicate. Although it is likely than only one major progressive deformation event occurred in the region (Delamerian Orogeny at ca. 500 Ma), structures developing early during the orogenesis may have been subsequently overprinted during the latter stages of shortening. Correspondingly complex structural relations are therefore possible, and have been identified. It follows that simple "folded layer cake" or "thrust & fold" models have not been rigidly applied.

3.1 Structure

3.1.1 Folding

The style of folding toward the north is mostly open with a marked tendency for hinges to be broad areas of flat dips with steep dips on limbs comparatively localised, such that some of the map-scale structures have a box-like profile. Anticline hinges are commonly tighter, such as the Winnininnie Dome, with narrow zones of flat dips in the hinge areas. Hinge areas in general are characterised by a well defined cleavage, evident both in the field and in the aeromagnetics.

High angle thrust faults are commonly associated with folding, particularly toward the southeast where many map-scale hinges appear to be bounded by anastomosing fault zones that attenuate fold limbs.

3.1.2 Breccia masses

Breccia bodies, commonly regarded as intrusive breccias and possibly diapirs of some kind, and generally mapped as the basal Neoproterozoic Callanna Group (Pk), can be shown in the aeromagnetics to be directly related to the fault systems referred to above.

3.1.3 Thrust faulting

Bedded faults (ie. bedding parallel thrusts or thrust flats) have been recognised during the aeromagnetic interpretation, largely through the presence of localised structural features that can only arise from the ramping of these thrust flats up through the stratigraphy in the thrust transport direction. Such structures are evident as footwall and hangingwall cut-outs of units, localised folds (eg. ramp anticlines) associated with minor changes the stratigraphic level of thrusts, or apparent localised stratigraphic disruption contained within a narrow stratigraphic interval.

One particular thrust flat appears to be consistently developed at or about the Umberatana Group - Wilpena Group contact throughout the Waukaringa - Manna Hill region, climbing gradually from the uppermost Umberatana Group into the lowermost part of the Wilpena Group northwestwards. These structures are, in the main, folded around the map-scale folds in the region and are probably thrusts that developed at an early stage of the orogenic

process, with the map-scale folding and associated high angle thrust faults probably developing in the latter stages of shortening.

Displacements on these earlier, bedded thrusts can not generally be determined but are probably not more than several km at the most on the most significant of these features. Some later high angle thrust structures may reactivate earlier bedded thrusts in fold limbs, or locally on appropriately oriented fold limbs, adopt a bedding parallel trajectory. Probable examples of both have been recognised, with the latter examples locally cutting out fold hinges.

The interaction between folding and later faulting, the style of the folding, and the trajectories of cleavage throughout the region are entirely consistent with a thrust-fold belt structural regime, indicating the existence of a basal detachment underling most of the region. It is thought likely that this main thrust detachment (décollement), or a major splay, comes to the surface between the Teetulpa Goldfield northwest of the Manna Hill Goldfield (where the cleavage is strong and shallowly south dipping), and inliers of Mesoproterozoic basement of the Olary Block to the northeast of the Manna Hill Goldfield. However, it is also probable that the margins of the Olary Block have been involved in the thrusting (ie. allochthonous), in order to account for folding in the cover sequence in areas between the basement inliers.

3.1.4 Thrust transport direction

The orientation and geometries of cleavage and fold axial planes, the asymmetry of folds and the direction in which thrusts seem to dominantly ramp up-section are all consistent with a thrust transport direction of approximately 330° (NW to NNW). These characteristics are best defined in the region north and northeast of Paratoo. The manner in which some folds terminate along strike and the character of a number of across-strike discontinuities can also be used to infer such a thrust transport direction.

3.2 Mineralisation

Most known mineralisation is associated with very small outcrop scale structures, typically < 0.5m thick and rarely > 1.5m, which cannot be imaged by, or discerned in the aeromagnetics.

It has been noted in field examinations that bedded veins which initiated early during tectonism (at the onset of folding) occur in the Waukaringa workings, at Westward Ho, Eudunda Hope and Elsie May in the Manna Hill Goldfield, and other localities. These veins are themselves folded on a small scale. Stiffer rock units such as the Cox Sandstone Member of the Tarcowie Siltstone seem to have localised the development of these bedded veins, as well as other cross cutting veins, particularly where the enclosing units are siltstone and shale dominated.

The more significant mineralisation occurs where additional perturbations were also active during folding, such as minor faults (oblique to cleavage) or vein sets developed at a high angle to bedding, or localised meso- to macroscopic folding parasitic on the map scale structures. Other gold occurrences are associated with parasitic fold structures, in particular roughly cleavage parallel veins and reefs occurring in the northern limb or hinge area such as at Birthday (Manna Hill) and in the vicinity of Mt Edwards.

Copper mineralisation is minor. In all examples a direct association with fault zones, or breccias we now regard as fault related, is evident. Little additional information has been derived from the magnetics with regard to possible controls on the localisation of these occurrences.

4.0 DISCUSSION

4.1 Telfer Model

From the Telfer experience a train of localised small domal features, possibly tight and locally disrupted, hosted by a sequence of interlayered stiffer (quartzite/sandstone) and weaker (shale) units would seem to be prospective. The Telfer scenario suggests that some lineament or discontinuity at depth has localised the development of the Main and West Domes, as well as much of the mineralisation on the scale of the Main Dome (this scenario is difficult to verify). Proximity to late or post-orogenic granitoids is also indicated.

Nichola Goellnicht's work (Ph.D. UWA) on Telfer indicates that a significant component of the fluid was derived from igneous sources, and identified the nearby Mt Crofton Granite as a likely source. The age difference between the Yeneena Group and the Mt Crofton Granite is similar to the difference between the Umberatana Group and the post-orogenic Ordovician granitoids to the south of the current area of interest.

Although the Middlevale Reef, a bedded quartz or quartz and sulphide reef, occurring below the base of a prominent quartzite unit, has been the main producer at Telfer, the 'E' reefs occurring above the Middlevale Reef have also contributed some ore, as have stockwork vein arrays developed immediately above the Middlevale Reef consisting largely of shallowly dipping veins. The 'E' Reefs are less continuous and do not follow a consistent stratigraphic horizon, having the appearance of small displacement bedded thrusts rather than bedded reefs or saddle reefs. A recent Newcrest Annual Report outlined the existence of repeated bedded vein-type reefs to depths of 1,000m or more down the axis of Main Dome.

From the above, targeting criteria should include:

a) localised domal structures (up to 6 km x 3 km) forming a zone or corridor
b) stratigraphy that includes abundant stiffer quartzite or sandstone intervals (for competency contrast)
c) late to post-orogenic granitoids within 10 to 20 km (see sketch map)
d) layer parallel quartz-sulphide reefs with stockworking in stiffer units

4.2 Other concepts

It has previously been argued in relation to targeting in the Adelaide Fold Belt that prospective environments might include;

a) zones like the so called Teetulpa Fracture Zone and other similarly trending features ("corridors") recognisable on regional maps,
b) structures in appropriate localities (eg. in the vicinity of bedded veins) that parallel the plunge of ore shoots as observed at Waukaringa, and
c) areas of flat cleavage such as in the vicinity of the Teetulpa Goldfield where depths to a detachment or basal décollement as inferred from the shallowness of cleavage dip might be small. In terranes of high P_{fluid} as is indicated by the nature of the

veining (bedded & cleavage parallel), such a flat lying structure, particularly in the vicinity of an irregularity, could be susceptible to large-scale dilation and thus mineralisation.

However, in relation to each of the above respectively it has been found that;

a) the north to north-northwest trending corridors or lineaments recognised in existing regional maps are not borne out in analysis of the aeromagnetics, and the tenor of associated mineralisation is not such that these features would comprise good target zones should they be recognised,

b) the empirical observation concerning the ore shoot at Waukaringa (not similarly evident at Ajax) has limited validity as the shoot may simply be the zone along which bedded veins at slightly different stratigraphic levels began to overlap and induced a kink-fold-like feature when the intervening material failed allowing the veins to coalesce - the plunge azimuth so produced does not appear to be geometrically related to any other structural element in the region of interest, and finally

c) detachment related mineralisation is possible as quartz "flat-makes", but is more commonly known as highly altered locally brecciated structures from extensional detachments, and defining a drillable target based on such a model will prove extremely difficult.

Slate-belt models may also conceivably be applied to some of the fold-fault geometries recognised in the region of interest, in particular where locally bedded reverse faults on one limb of an anticline become cross-cutting dilational structures on the opposing limb. One such zone, for example, may occur along the anticline axis to the south of the Ajax Mine. However, fold styles that are too open and a lack of appropriate vein arrays and structural domains indicate that slate-belt models are not adequately applicable.

4.3 Exploration Potential

In general, the scale of known Au ± Cu mineralisation occurring in the region is one or two orders of magnitude smaller than is required to be economic in current circumstances. Known mineralisation is associated with narrow, mostly discontinuous veins/structures of limited tonnage potential. The aim in the region has therefore been to generate targets based on appropriate scale criteria with potential for >½ million oz. orebodies. Locating a 50,000 oz orebody based on Waukaringa-type criteria could not be regarded as a desirable result. Despite some caution in not allowing such criteria (eg. well developed Cox Sandstone Member) to dominate the targeting process, this has so far tended to occur in the absence of other encouragement.

4.3.1 Applying Telfer models

By direct comparison with Telfer and the Paterson Province, Equinox's current tenement holding may be too far from the granitoids to capitalise on the input from granitoid derived fluids. Conversely, the folding patterns and the spacing of significant discontinuities in the region immediately surrounding the Telfer deposit seem more akin to those of the Waukaringa - Manna Hill portions of the Adelaide Fold Belt. Thus, direct comparisons seem inappropriate.

Finer-grained sedimentary rocks dominate the Adelaide Fold Belt succession, but more competent units in abundances and thicknesses comparable to the Yeneena Group at Telfer seem most likely to occur near the base of the Umberatana Group (eg. parts of the Pualco Tillite, Benda Siltstone, Appila Tillite, Wilyerpa Formation, and equivalents), and

near the top of the Umberatana Group extending into the base of the Wilpena Group (eg. Gumbowie Arkose, Pepuarta Tillite, Grampus Quartzite, Nuccaleena Formation, Seacliff Sandstone, and equivalents). However, these potentially favourable units occur in areas lacking suitable Telfer-style structural settings and far removed from post-orogenic Ordovician granites. No obvious potential Telfer style targets have been identified within the Waukaringa - Manna Hill region.

5.0 CONCLUSIONS

A detailed aeromagnetic interpretation of the Waukaringa region of the Adelaide Fold Belt has revealed the following:

- The regional structure is far more complicated and discontinuous than is shown on published maps;
- Geometries observed are typical of thin skinned thrust-fold style terranes;
- Two main thrust styles have been observed, (i) small displacement layer parallel "early" thrusts, including one prominent one at or near the Umberatana Group / Wilpena Group contact, and (ii) high angle "late" reverse faults associated with folding;
- A NW to NNW tectonic transport direction is indicated, based on fold terminations, fold axial plane orientations, and across strike fault / discontinuity orientations;
- Breccia, probably tectonic, and diapiric intrusions mapped as belonging to the Callanna Group (basal Middle Proterozoic) are intimately associated with faults;
- Folds, especially synclines, are mostly open with broad flat dipping hinges and more localised steeper limbs ("box folds" - also observed in the field);
- Anticlines are generally tighter structures than synclines;
- In some cases fold limbs are truncated by "early" and/or "late" thrusts;
- In areas of low angle layering (typically fold hinge regions with flat dip), geometries cannot be resolved by existing aeromagnetic data;
- The aeromagnetic pattern has been complicated by a set of NW and NE trending late dykes, veins, and/or joints which range from cross-cutting to layer parallel;
- The margins of the Olary Block have been involved in Adelaide Fold Belt thrusting, particularly in the eastern portion of the tenement block;
- Most of the region is underlain by a basal thrust detachment (décollement) which may surface in the vicinity of the Teetulpa Goldfield;
- Most known Au-Cu mineralisation is associated with small scale structures which are not always readily identified on the aeromagnetics;
- Telfer-type targets or environments have not been identified in any of the existing tenements and direct comparisons seem inappropriate - potential is low;
- Slate-belt models for gold mineralisation are not applicable.

6.0 RECOMMENDATIONS

Aeromagnetic interpretation and field investigations have failed to highlight any geological environments or relationships analogous to or reminiscent of Telfer geology within the existing Waukaringa - Manna Hill region. In the absence of any other encouragement it is recommended that all Adelaide Fold Belt tenements be relinquished.

APPENDIX 5

ROCK CHIP SAMPLE DETAILS

SAMPLE	EASTING	NORTHING	TENEMENT	PROSPECT	DESCRIPTION	STRUCTURE
WD01	378485	6398919	Manna Hill EL1961	Winnininnie Dome (West)	quartz vein, weakly ferruginous, 5-10cm thick, cleavage parallel	vein & cleavage dip 60 > 330
WD02	378485	6398919	Manna Hill EL1961	Winnininnie Dome (West)	ferruginous quartz vein, locally strongly laminated, 10-25cm thick, stratabound	vein dips 20 > 190
WD03	378329	6399147	Manna Hill EL1961	Winnininnie Dome (West)	ferruginous, intersecting quartz veins, 1-10cm thick	various vein orientations: 77 > 60, 78 > 168, 38 > 198
WD04	378148	6399105	Manna Hill EL1961	Winnininnie Dome (West)	ferruginous quartz vein, 25-30cm thick, cleavage parallel	vein dips 85 > 165 (subvertical)
WD05	378781	6399083	Manna Hill EL1961	Winnininnie Dome (West)	quartz vein, locally ferruginous, 5-20cm thick, cleavage parallel	vein dips 85 > 150 (subvertical)
WD06	378781	6399083	Manna Hill EL1961	Winnininnie Dome (West)	ironstone band within siltstone, adjacent to WD05	irregular
WD07	379013	6399155	Manna Hill EL1961	Winnininnie Dome (West)	ironstone vein & ferruginous quartz float, 5-20cm thick, cleavage parallel	cleavage dips 80 > 325
WD08	378511	6398800	Manna Hill EL1961	Winnininnie Dome (West)	ironstone vein (float?), minor quartz & green Cu staining, 1-2m wide?	cleavage dips 80 > 340
WD09	378511	6398800	Manna Hill EL1961	Winnininnie Dome (West)	ironstone vein, 10-20cm thick, cleavage parallel	vein dips 75 > 140
WD10	378705	6399037	Manna Hill EL1961	Winnininnie Dome (West)	ironstone pit spoils, from stratabound vein, on strike from WD08	vein dips 30 > 170
WD11	378705	6399037	Manna Hill EL1961	Winnininnie Dome (West)	ironstone pit spoils, green Cu staining, from stratabound vein, on strike from WD09	vein dips 32 > 174
WD12	386328	6401952	Manna Hill EL1961	Winnininnie Dome (East)	ferruginous baryte vein in costean, max 1m thick, cleavage parallel ?	vein strikes 245, dip steep ?
WD13	386730	6401801	Manna Hill EL1961	Winnininnie Dome (East)	ferruginous & vuggy quartz vein, 5-10cm thick, discontinuous, cleavage parallel	cleavage dips 70 > 160, bedding 15 > 345
WD14	386730	6401801	Manna Hill EL1961	Winnininnie Dome (East)	ferruginous quartz vein, 10-20cm thick, stratabound	vein dips 50 > 300, lineation plunges 20 > 240
WD15	386730	6401801	Manna Hill EL1961	Winnininnie Dome (East)	bifurcation of WD14 ferruginous quartz vein, 1.3m thick, stratabound	similar to WD14
WD16	386730	6401801	Manna Hill EL1961	Winnininnie Dome (East)	ferruginous quartz vein, 10cm thick, stratabound, along strike from WD14 & WD15	similar to WD14
WD17	386730	6401801	Manna Hill EL1961	Winnininnie Dome (East)	ferruginous quartz vein, locally gossanous, up to 2m thick ?, poddy, stratabound	similar to WD14
WD18	386706	6402038	Manna Hill EL1961	Winnininnie Dome (East)	ferruginous baryte vein, 0.5m thick, cross cutting cleavage along strike from WD12	vein dips 85 > 335, cleavage dips 65 > 145
WD19	386400	6402115	Manna Hill EL1961	Winnininnie Dome (East)	quartz vein, irregularly ferruginisation, relatively massive, scree & subcrop	vein strike 260, dip unknown
WD20	383004	6402115	Manna Hill EL1961	Winnininnie Dome (Central)	quartz vein blob, irregularly ferruginised, in old digging, cleavage parallel ?	attitude uncertain
WD21	383004	6402115	Manna Hill EL1961	Winnininnie Dome (Central)	quartz vein, locally ferruginous, max 1m thick, cleavage parallel ?, next to WD20	vein dips 90 > 320
WD22	383004	6402115	Manna Hill EL1961	Winnininnie Dome (Central)	quartz vein & ferruginous vein float, 20-30cm thick, cross cutting cleavage	vein dips 63 > 294, bedding 58 > 148, cleavage 69 > 355
WD23	383004	6402115	Manna Hill EL1961	Winnininnie Dome (Central)	highly ferruginous quartz vein float, near WD20 & WD21	unknown
WD24	383639	6400505	Manna Hill EL1961	Winnininnie Dome (Central)	quartz-ironstone vein, 10-20cm wide, steep & cross cutting bedding	vein dips 85 > 090, quartzite bedding dips 25 > 180
239	320923	6435238	Red Hill EL1962	Helene Shaft	highly gossanous shaft dump spoils	curved ironstone vein, average dip 60 > 330?
240	320923	6435238	Red Hill EL1962	Helene Shaft	weakly gossanous outcropping ironstone vein	curved ironstone vein, average dip 60 > 330?
241	320923	6435238	Red Hill EL1962	Helene Shaft	weakly ferruginous laminated quartz vein dump spoils	curved ironstone vein, average dip 60 > 330?
242	321031	6432678	Red Hill EL1962	Erina Prospect Region	gossanous ironstone vein, 10-15cm wide, stratabound	vein dips 87 > 150
243	323704	6435268	Red Hill EL1962	Erina Prospect	laminated ferruginous quartz vein, max 0.5m thick, stratabound, cut by small fault	vein dips 30 > 355, lineation plunges 35 > 345
244	323952	6435275	Red Hill EL1962	Erina Prospect	ferruginous quartz vein as above	vein dips 35 > 355, cleavage dips 85 > 325
245	323947	6435272	Red Hill EL1962	Erina Prospect	highly ferruginous quartz vein, locally gossanous, stratabound, pit spoils	bedding dips 22 > 355
246	396537	6417985	Manna Hill EL1961	Manna Hill - Nectar Mine	weakly ferruginous quartz vein, 20cm thick, pit spoils	vein dips 90 > 150
247	396654	6417643	Manna Hill EL1961	Manna Hill - No Gammon Mine	ferruginous & gossanous quartz vein pit spoils	bedding dips 10 > 320, cleavage dips 60 > 150
248	393189	6416118	Manna Hill EL1961	Manna Hill - Homeward Bound Mine	ferruginous laminated quartz vein, stratabound, pit spoils	bedding dips 18 > 180
249	393189	6416118	Manna Hill EL1961	Manna Hill - Homeward Bound Mine	strongly laminated & weakly ferruginous quartz vein pit spoils	unknown
250	393189	6416118	Manna Hill EL1961	Manna Hill - Homeward Bound Mine	laminated & massive ferruginous quartz vein pit spoils	unknown
251	390243	6417576	Manna Hill EL1961	Manna Hill - Eudunda Hope Mine	laminated & massive ferruginous quartz vein, partly gossanous, pit spoils	bedding dips 10 to 15 > 170, cleavage 85 > 165
252	390065	6417914	Manna Hill EL1961	Manna Hill - Elsie May Mine	gossanous quartz vein shaft spoils, vein 10-25cm thick & stratabound	bedding dips 25 > 180, cleavage dips 75 > 340
253	389735	6417864	Manna Hill EL1961	Manna Hill - Elsie May Mine	gossanous quartz vein shaft spoils, vein 10-15cm thick & stratabound	bedding & vein dips 25 > 160
254	388335	6417505	Manna Hill EL1961	Manna Hill - Westward Ho! Mine	highly ferruginous quartz vein dump spoils, stratabound vein	bedding dips 20 > 190, cleavage dips 90 > 345
255	377495	6420293	Manna Hill EL1961	Manna Hill - Royal Charlie Mine	gossanous quartz vein shaft spoils, stratabound vein	bedding dips 50 > 170
256	377345	6428491	Manna Hill EL1961	Teetulpa Goldfield - Bismark No 2	ferruginous quartz vein shaft spoils, steep vein 0.2-0.5m wide	vein dips 85 > 260, cleavage 34 > 182, bedding 35 > 000
257	377345	6428491	Manna Hill EL1961	Teetulpa Goldfield - Horseshoe Shaft	ferruginous & gossanous quartz vein shaft spoils, max 30cm thick	vein dips 70 > 080 at surface, but steeper at depth
258	377160	6428535	Manna Hill EL1961	Teetulpa Goldfield - Blue Star	ferruginous & gossanous quartz vein shaft spoils, max 20cm thick	vein dips 80 > 065, bedding 40 > 340, cleavage 20 > 155
259	377345	6428491	Manna Hill EL1961	Teetulpa Goldfield - Ironclad Extended	ferruginous & gossanous quartz vein shaft spoils, 2 veins max 20cm thick	veins dip 80 > 065, bedding dips 20 > 155
260	377706	6428289	Manna Hill EL1961	Teetulpa Goldfield - Prince Consort	weakly ferruginous quartz-carbonate vein shaft spoils	bedding dips 10 > 170, cleavage dips 35 > 170
270	392416	6418771	Manna Hill EL1961	Manna Hill - Birthday Line	ferruginous quartz vein, up to 1.5m wide, cleavage parallel	vein dips 65 > 145, bedding dips 33 > 135
271	386684	6401905	Manna Hill EL1961	Winnininnie Dome (East)	stockwork of 0.5-1.5cm wide ferruginous quartz veins & fractures in siltstone	mixed vein orientation, "flat" & "steep" stockwork
272	379337	6399201	Manna Hill EL1961	Winnininnie Dome (West)	ironstone vein, 25cm thick, 1of 5 in pit, stratabound, strike up to 350m	vein dips 40 > 160
273	379337	6399201	Manna Hill EL1961	Winnininnie Dome (West)	ironstone vein, 15-25cm thick, 1of 5 in pit, stratabound	vein dips 42 > 160
274	379405	6399567	Manna Hill EL1961	Winnininnie Dome (West)	quartz-ironstone vein in creek, area 3m x 2m, possible float?	unknown

APPENDIX 6

ROCK CHIP SAMPLE ASSAY RESULTS

SAMPLE NUMBER	Au ppm	Au Dp1 ppm	Ag ppm	As ppm	Bi ppm	Cd ppm	Co ppm	Cr ppm	Cu ppm	Fe %	Mn ppm	Mo ppm	Ni ppm	P ppm	Pb ppm	V ppm	Zn ppm
WD01	0.24	0.26	<1	40	<5	<2	6	420	50	3.66	1320	4	19	100	<5	9	15
WD02	0.50		2	390	40	<2	90	300	1200	23.20	6320	<3	95	1530	10	42	60
WD03	0.15		1	780	10	<2	80	155	280	37.20	10900	8	60	2080	20	42	115
WD04	2.59	2.30	4	1410	20	<2	175	320	1330	40.00	260	4	105	1500	30	39	36
WD05	0.30	0.28	<1	390	<5	<2	29	630	120	5.99	1670	4	29	270	10	16	21
WD06	0.09	0.11	14	1120	25	6	880	28	4190	62.40	66200	14	400	2400	10	60	280
WD07	0.03	0.02	4	450	15	3	650	75	1740	50.00	56600	8	120	1010	15	140	140
WD08	0.93	0.83	4	630	25	4	175	75	8770	61.80	19200	8	175	2980	30	125	300
WD09	0.08		5	6850	70	5	37	19	1090	49.10	10900	10	70	570	20	155	200
WD10	0.03		5	430	10	2	50	55	12700	41.50	12300	6	80	1870	5	37	140
WD11	0.01		550	3490	1010	6	44	100	50300	34.00	13100	6	100	1900	20	30	400
WD12	0.34	0.36	30	60	15	<2	14	105	210	39.40	5900	6	70	1170	10	175	38
WD13	0.05		170	2180	75	2	460	120	2000	34.70	1720	6	360	1360	10	30	49
WD14	0.07		3	250	5	<2	1360	230	690	12.80	59400	4	470	1830	5	25	135
WD15	0.02		20	970	15	<2	90	150	310	27.10	7550	4	80	2350	10	33	60
WD16	0.19		2	740	15	<2	280	165	240	27.40	21100	10	1220	3110	15	70	65
WD17	0.03		6	610	10	3	710	80	560	22.00	57900	8	670	2520	5	37	280
WD18	0.03		2	36	10	<2	19	115	29	32.80	7250	6	70	1900	5	290	31
WD19	0.01		5	125	<5	<2	27	560	85	5.01	1340	6	46	110	<5	19	24
WD20	0.06		2	1690	5	<2	310	310	175	23.20	3000	<3	210	1020	<5	22	23
WD21	0.22	0.24	2	320	10	<2	47	550	80	10.00	410	6	200	660	<5	9	20
WD22	0.25		2	1610	5	<2	180	115	150	40.00	11600	4	450	5700	<5	35	31
WD23	0.05		3	3490	20	3	200	25	280	57.60	360	8	220	3240	5	35	50
WD24	0.04		2	115	10	<2	85	70	30	43.30	1310	6	130	1430	<5	60	50
239	0.01		<1	54	5	5	59	84	165	19.10	5300	6	91	6100	35	63	500
240	<0.01		2	92	15	3	61	57	48	29.50	700	8	190	8800	35	84	800
241	<0.01	<0.01	<1	4	<5	<2	<2	300	25	0.74	110	<3	6	100	15	4	18
242	0.02		<1	46	15	<2	<2	29	24	30.00	300	6	33	900	50	170	100
243	0.13		<1	52	60	<2	7	180	1900	15.60	200	4	33	1100	400	27	300
244	0.10		2	38	125	<2	3	200	700	5.60	115	<3	18	500	110	23	91
245	0.21		6	83	190	<2	20	200	12000	11.20	500	4	51	500	500	26	400
246	0.01		<1	8	5	<2	14	400	195	3.82	200	<3	43	145	300	14	300
247	0.06		<1	1800	10	2	24	120	300	16.30	5300	4	50	600	300	55	300
248	0.87	1.17	<1	8	15	<2	21	300	600	3.47	600	<3	30	110	40	13	54
249	2.75	2.48	<1	400	25	<2	200	175	500	2.81	1500	<3	53	170	185	9	190
250	9.94	9.79	<1	78	135	<2	98	200	1300	5.24	1200	<3	125	105	200	7	200
251	2.08	1.81	6	1000	70	11	17	200	800	15.90	300	6	24	105	3000	24	5400
252	7.33	7.43	3	2400	20	27	38	68	19600	24.40	400	4	80	300	90	27	4400
253	4.94	4.90	<1	5200	30	<2	80	82	800	25.60	10100	8	32	180	40	37	150
254	3.77	3.76	1	6700	65	<2	24	200	1800	12.70	200	10	14	200	600	51	115
255	15.00	14.10	7	600	110	<2	27	160	300	16.50	700	6	34	1400	800	23	500
256	0.02		<1	200	10	<2	10	300	300	5.05	2800	8	25	300	10	18	54
257	0.09		<1	600	65	<2	200	195	700	10.10	38900	12	400	600	500	120	300
258	0.03		<1	800	<5	<2	49	200	4400	5.98	27800	6	50	200	5	11	15
259	0.16		6	600	200	<2	300	175	1000	14.60	2600	4	900	85	600	18	26
260	<0.01		<1	44	10	<2	11	190	300	3.07	3600	<3	20	80	10	18	17
270	0.04	0.05	<1	81	<5	<2	5	320	32	2.58	320	<3	44	40	280	5	120
271	0.03		<1	42	<5	<2	42	58	50	17.80	7400	<3	62	1300	<5	33	23
272	0.04		<1	150	<5	<2	200	54	1100	43.60	16300	4	91	960	10	79	82
273	0.03	0.03	<1	340	<5	<2	280	100	2500	46.70	28600	6	185	1500	10	195	220
274	0.07	0.07	<1	520	5	<2	115	34	800	45.90	8200	4	115	780	15	42	120

APPENDIX 7

BLEG STREAM SAMPLE DETAILS

BLEG SAMPLE DETAILS
RED HILL

SAMPLE	EASTING	NORTHING	TENEMENT	PROSPECT	DESCRIPTION
1	355831	6434935	Red Hill EL1962	Moneo Ridge Region	silt & clay, minor pebbles & cobbles, minor creek 1m deep & 1m wide
2	355831	6434935	Red Hill EL1962	Moneo Ridge Region	silt & clay, some cobbles, significant creek 2m deep & up to 10m wide
3	355873	6434671	Red Hill EL1962	Moneo Ridge Region	silt & clay, minor cobbles, minor creek 1.5m deep & 0.5-1.5m wide
4	355915	6434355	Red Hill EL1962	Moneo Ridge Region	silt & sand, common pebbles, possible trap site, minor creek 1m deep & 3-4m wide
5	355915	6434355	Red Hill EL1962	Moneo Ridge Region	sand & silt, minor cobbles, likely trap site, minor creek 1m deep & 2-3m wide
6	356366	6436835	Red Hill EL1962	Moneo Ridge Region	sand, major creek 2m deep & up to 10m wide (main channel 5m)
7	356366	6436835	Red Hill EL1962	Moneo Ridge Region	sand, major creek 2m deep & up to 15m wide
8	356391	6437520	Red Hill EL1962	Moneo Ridge Region	sand, major creek 1.5m deep & 5-10m wide
9	355580	6436357	Red Hill EL1962	Moneo Ridge Region	sand, major creek 1m deep & up to 10m wide
10	355580	6436357	Red Hill EL1962	Moneo Ridge Region	sand , some silt & cobbles, moderately sized creek 1m deep & up to 10m wide
11	357035	6435824	Red Hill EL1962	Moneo Ridge Region	sand & silt, some pebbles, minor creek 1m deep & 5-10m wide
12	357035	6435824	Red Hill EL1962	Moneo Ridge Region	sand, some silt & cobbles, minor creek 1-1.5m deep, 1-5m wide (main channel 2m)
19	357690	6434580	Red Hill EL1962	Moneo Ridge Region	sand & silt, poorly defined creek with local wash area, 0.5m deep & up to 5m wide
301	320638	6432001	Red Hill EL1962	South of Erina Prospect	sand & silt, poorly defined channel (20cm deep) within much larger wash area
302	320425	6432689	Red Hill EL1962	South of Erina Prospect	clay & silt, poorly defined creek 20cm deep & 1m wide
303	323735	6435437	Red Hill EL1962	Erina Prospect	coarse sand to boulders, likely trap site, high energy creek 2-3m deep, up to 5m wide
304	323640	6435967	Red Hill EL1962	Erina Prospect	coarse sand to cobbles, high energy creek 2-3m deep & up to 4m wide
305	323018	6434981	Red Hill EL1962	Erina Prospect	coarse sand to boulders, minor high energy creek 2m deep & 2-3m wide
306	323018	6434981	Red Hill EL1962	Erina Prospect	coarse sand to cobbles, possible trap site, minor creek 1m deep & 1-2m wide
307	323013	6434726	Red Hill EL1962	Erina Prospect	coarse sand to cobbles, likely trap site, small creek 1m deep & 0.5-1.0m wide
308	323013	6434726	Red Hill EL1962	Erina Prospect	silt & sand, minor pebbles, poorly defined minor creek 0.5-1.0m deep & up to 1m wide
309	323364	6434215	Red Hill EL1962	Erina Prospect	silt & sand, minor creek 1-3m deep & 1m wide, at/near head of drainage
310	323364	6434215	Red Hill EL1962	Erina Prospect	silt & sand, minor creek 1-2m deep & 0.5-1.0m wide, at/near head of drainage
311	323311	6434554	Red Hill EL1962	Erina Prospect	silt & sand, minor cobbles, minor creek 1m deep & 1m wide, at/near head of drainage
312	324013	6434866	Red Hill EL1962	Erina Prospect	coarse sand to cobbles, trap site, minor creek 1m deep & 1-2m wide
313	324013	6434866	Red Hill EL1962	Erina Prospect	coarse sand to cobbles, possible trap site, minor high energy creek 1-3m deep & 3m wide

00072

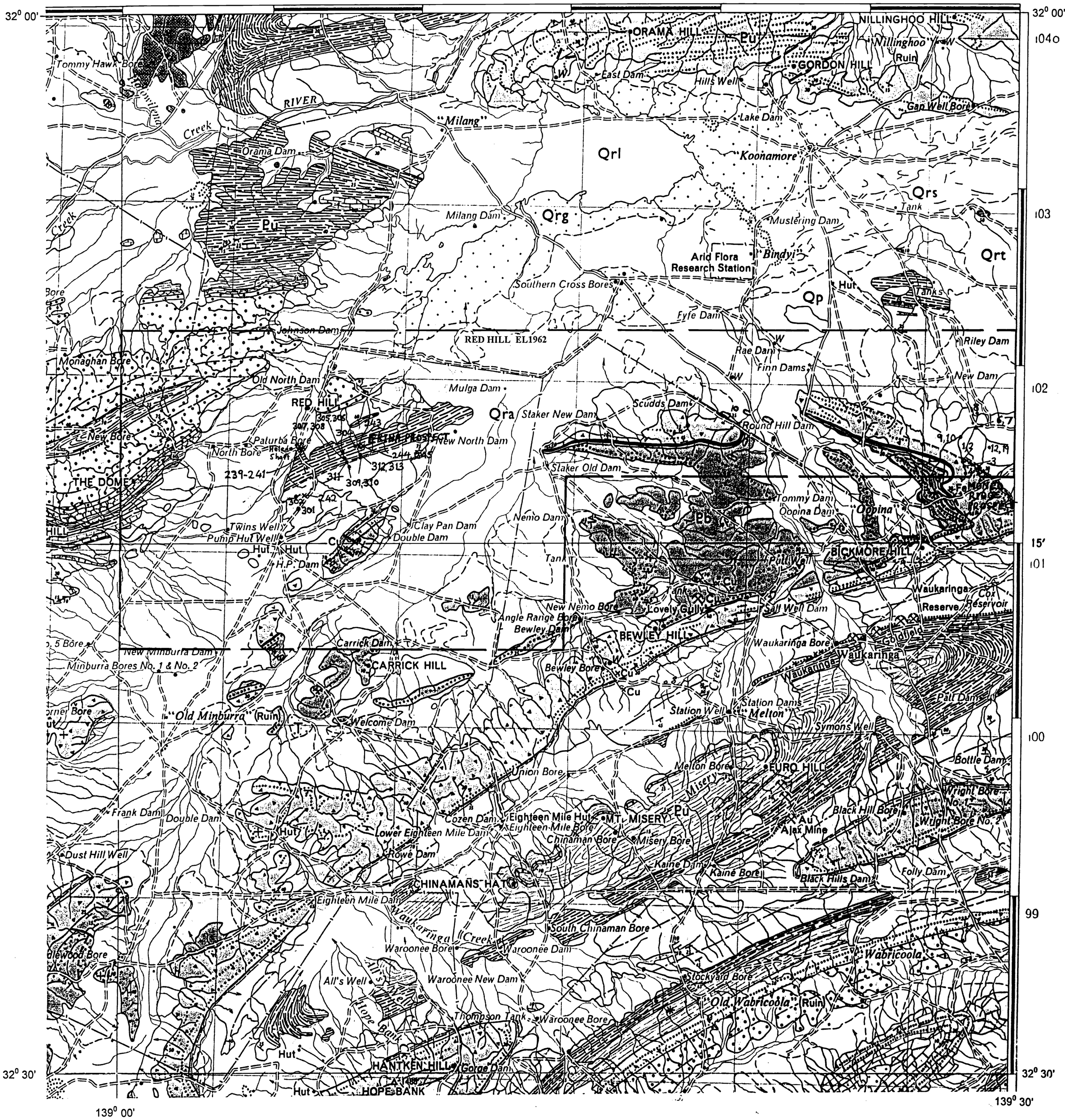
APPENDIX 8

BLEG STREAM SAMPLE ASSAY RESULTS

BLEG ASSAY RESULTS
RED HILL

SAMPLE	EASTING	NORTHING	Au ppb	Cu ppm
1	355831	6434935	0.8	1.40
2	355831	6434935	0.5	1.65
3	355873	6434671	0.8	2.10
4	355915	6434355	0.3	1.35
5	355915	6434355	0.2	1.70
6	356366	6436835	0.7	1.25
7	356366	6436835	0.6	1.00
8	356391	6437520	<0.1	0.60
9	355580	6436357	0.1	0.65
10	355580	6436357	0.2	0.50
11	357035	6435824	1.1	1.60
12	357035	6435824	1.2	1.35
19	357690	6434580	0.6	1.90
301	320638	6432001	0.8	3.80
302	328425	6432689	0.9	3.10
303	323735	6435437	0.5	1.10
304	323640	6435967	0.6	1.40
305	323018	6434981	0.2	1.25
306	323018	6434981	0.3	1.60
307	323013	6434726	0.6	1.65
308	323013	6434726	0.1	1.95
309	323364	6434215	<0.1	1.75
310	323364	6434215	0.1	1.45
311	323311	6434554	0.7	1.50
312	324013	6434866	0.2	2.30
313	324013	6434866	0.4	1.85

8970-1



TN
GN
MN
GRID CONVERGENCE 0.9°
GRID/MAGNETIC ANGLE 6.5°

True north, grid north and magnetic north are shown diagrammatically for the centre of the map. Magnetic north is correct for 1984 and moves easterly by 0.1° in about four years.

INDEX TO ADJOINING SHEETS
(not necessarily published)

WILPENA 6634	WILLIPPA 6734	CURNAMONA 6834
CARRIETON 6633	KOONAMORE 6733	WINNININNIE 6833
ORRORROO 6632	PARATOO 6732	YUNTA 6832

This map is part of sheet
SI 54-1 ORRORROO
in the 1:250 000 scale series

SCALE 1 : 100 000

REFER TO ORRORROO 1:250,000 GEOLOGY MAP SHEET FOR GEOLOGICAL LEGEND

242 × Rock Chip Sample Location
12 • BLEG Stream Sample Location

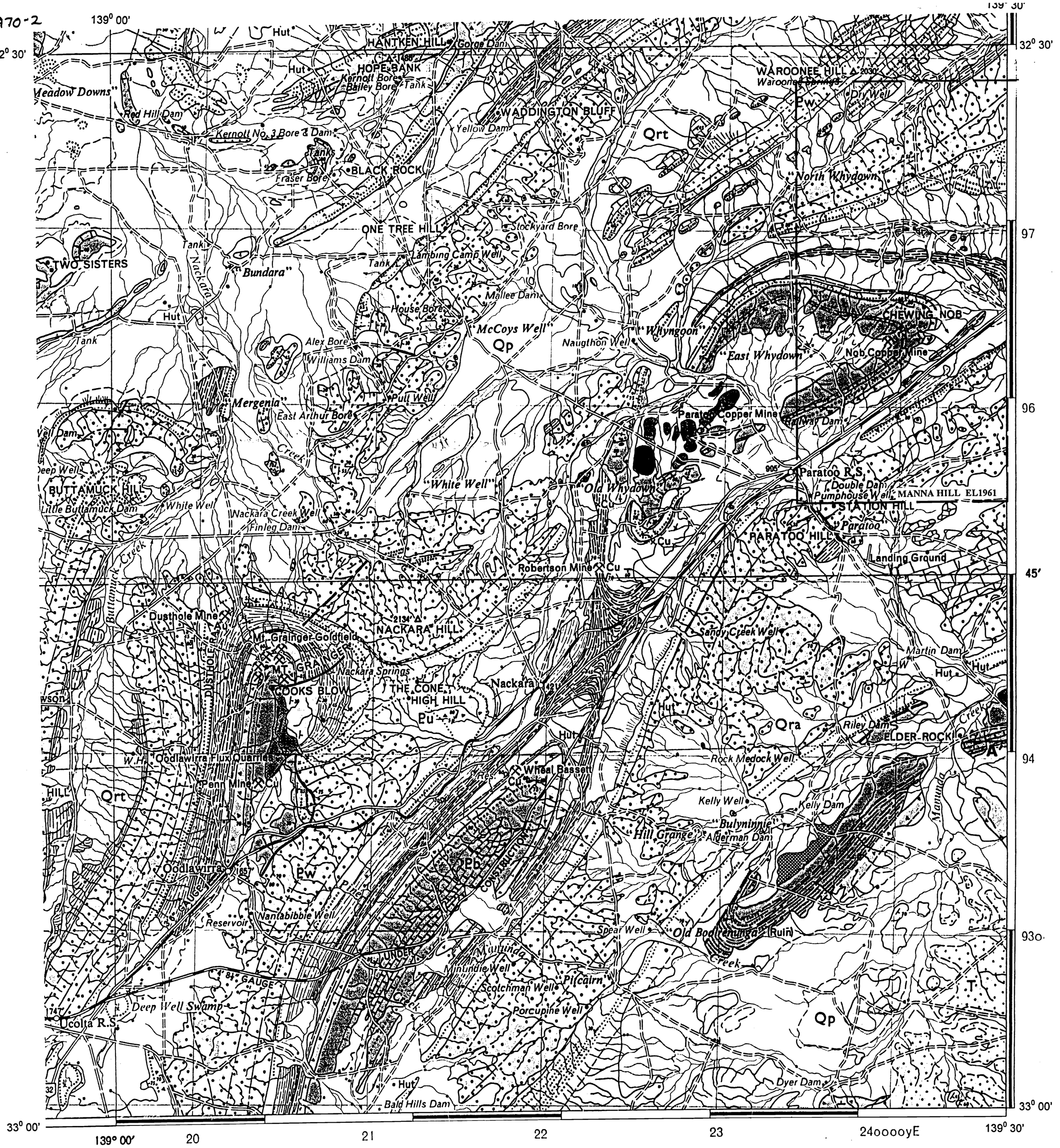
A.C.N. 009 681 777
EQUINOX RESOURCES NL

GEOLOGY AND SAMPLE
LOCATION MAP
KOONAMORE 1:100,000 SHEET

Author:	C.S.T.	Scale:	100,000
Date:	Sep-95	No:	ENCLOSURE 1

8970-1

8970-2



GN
TN
MN
GRID CONVERGENCE 0.9°
GRID/MAGNETIC ANGLE 6.6°

True north, grid north and magnetic north are shown diagrammatically for the centre of the map. Magnetic north is correct for 1985 and moves easterly by 0.1° in about four years.

INDEX TO ADJOINING SHEETS
(not necessarily published)

CARRIETON 6633	KOONAMORE 6733	WINNININNIE 6833
ORRORROO 6632	PARATOO 6732	YUNTA 6832
JAMESTOWN 6631	CAROONA 6731	MURKABY 6831

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SI 45–1 ORRORROO
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SCALE 1 : 100 000

REFER TO ORRORROO 1:250,000 GEOLOGY MAP SHEET FOR GEOLOGICAL LEGEND

A.C.N. 008 681 777
EQUINOX RESOURCES NL

GEOLOGY AND SAMPLE
LOCATION MAP
PARATOO 1:100,000 SHEET

Author:	C.S.T.	Scale:	100,000
Date:	Sep-95	No:	ENCLOSURE 2

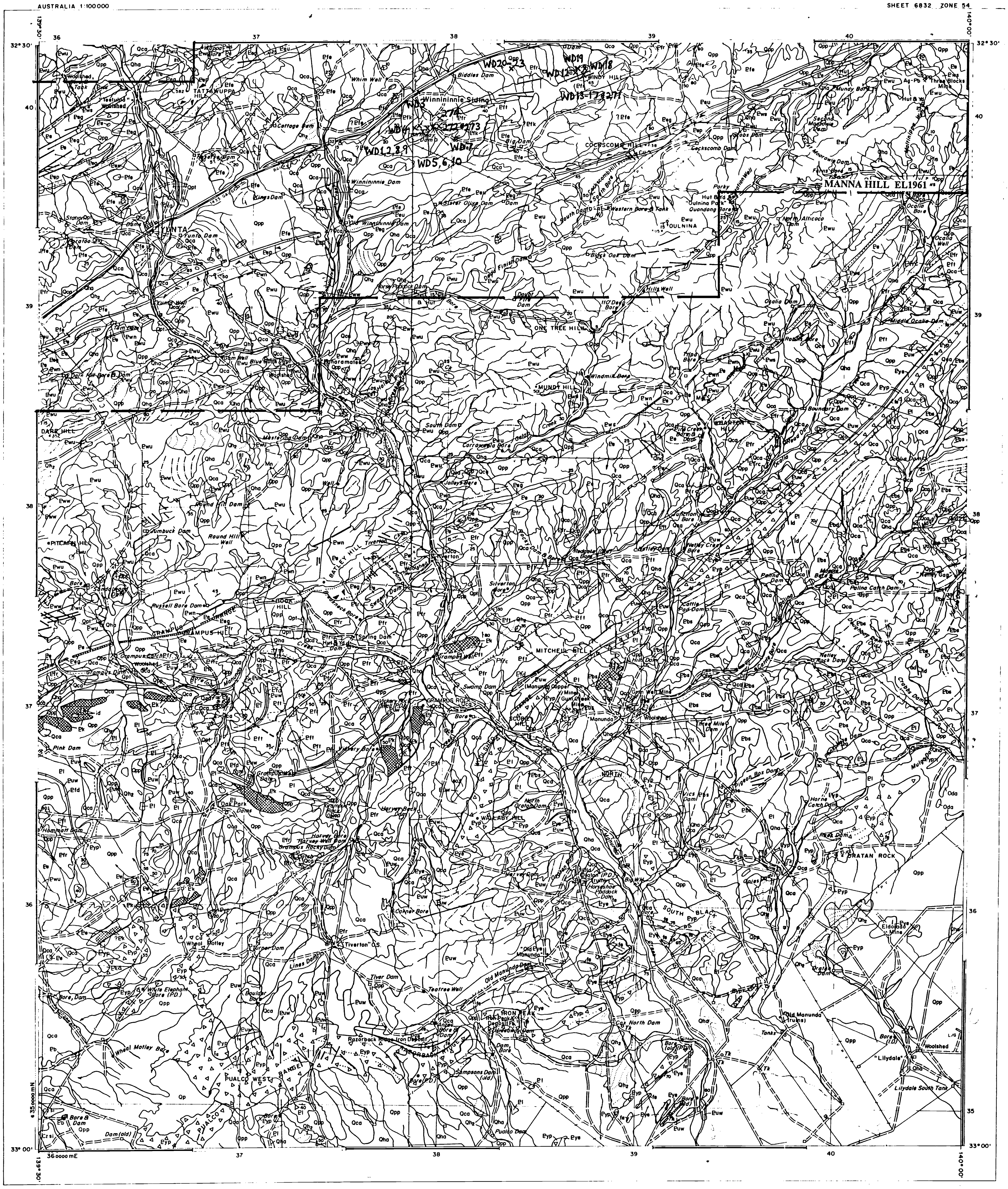
8970-2

8970-3

YUNTA

GEOLOGICAL SURVEY OF SOUTH AUSTRALIA
DEPARTMENT OF MINES AND ENERGY ADELAIDE

AUSTRALIA 1:100 000 — SHEET 6832 ZONE 54



HEAD STATION, OUT STATION, HUT
NATIONAL ROUTE NUMBER
HIGHWAY OR MAIN ROAD
SECONDARY ROAD
TRACK
TRACK ALONG BOUNDARY FENCE
RAILWAY AND STATION
RAILWAY AND SIDING
MAJOR ROAD BRIDGE, RAILWAY BRIDGE
BOUNDARY FENCE
INTERNAL FENCE
VERMIN PROOF, DOG FENCE — VPF DF
POWER TRANSMISSION LINE
MINERAL FEATURES
MINOR MINERAL OCCURRENCE, PROSPECT
MINE, ALLUVIAL WORKINGS
OPEN CUT, QUARRY
YARD
TRIG-STATION, ASTRONOMICAL STATION
IDENTIFIED HILL OR MOUNTAIN, CAIRN, PILE
SPOT ELEVATION — 73
CONTOURS, DEPRESSION CONTOURS — 100, 10
ESCARPMENT
EMBANKMENT
SAND DUNE
DRAINAGE
RIVER, CREEKS
BRAIDED STREAM WITH FLOOD CHANNEL
FLOOD PLAIN BOUNDARY
CLAYPAN, SALTPAN (PLAYA LAKE), SWAMP
BORE, WELL
TANK
ARTESIAN BORE
SPRING
WATERHOLE
DAM

1:100 000 SHEET INDEX

WINNININNIE	OLARY	MINGARY
	OLARY	
YUNTA	ANABAMA	OAKVALE

DEPARTMENT OF MINES AND ENERGY

SCALE 1:100 000

KILOMETRES 2 1 0 2 4 6 8 10 12 KILOMETRES

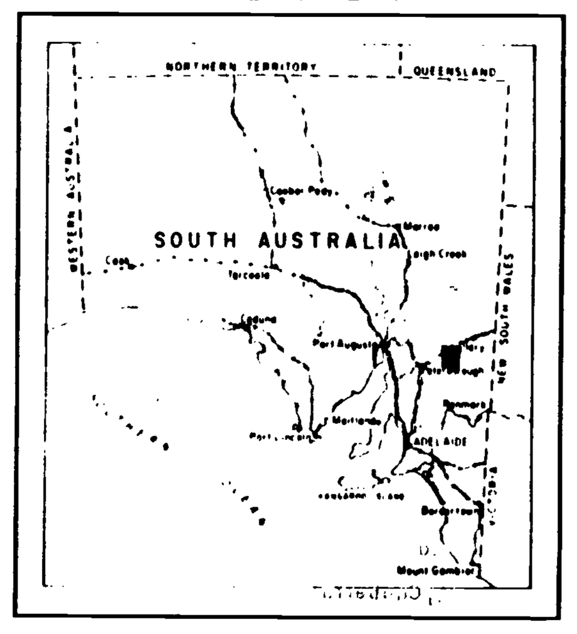
UNIVERSAL TRANSVERSE MERCATOR PROJECTION
HORIZONTAL DATUM AUSTRALIAN GEODETIC GRID 1966
GRID LINES ARE 10 000-METRE INTERVALS OF THE AUSTRALIAN MAP GRID

Compiled from material supplied by Division of National Mapping, Canberra

Prepared by the Drafting Branch for use within the SA Department of Mines and Energy

WD20 × Rock Chip Sample Location

LOCALITY PLAN



A.C.N. 066 881 777
EQUINOX RESOURCES NL

GEOLOGY AND SAMPLE LOCATION MAP
YUNTA 1:100,000 SHEET

Author:	C.S.T.	Scale:	100,000
Date:	Sep-95	No:	ENCLOSURE 3

8970-3

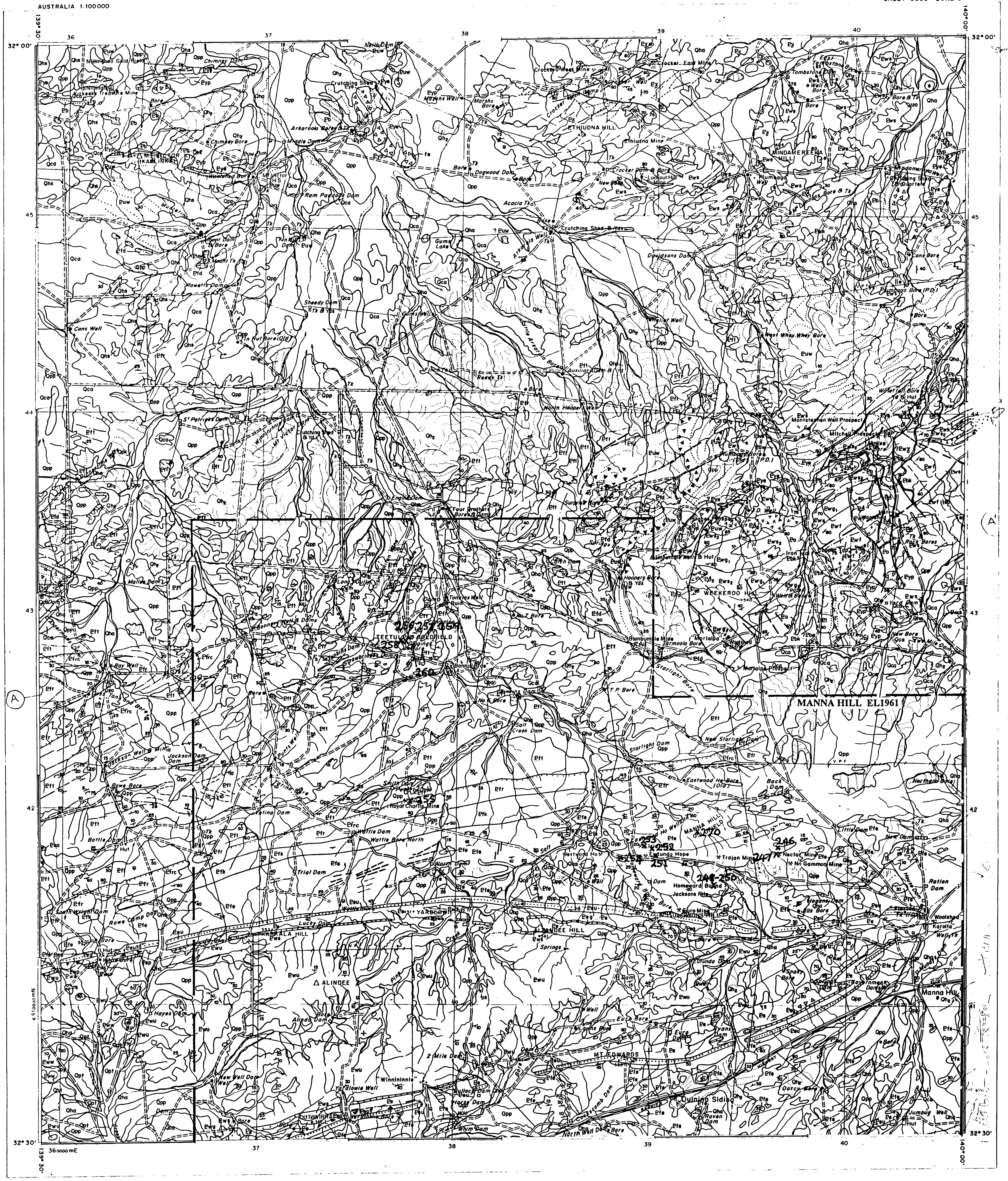
8970-4

WINNININNIE

GEOLOGICAL SURVEY OF SOUTH AUSTRALIA
DEPARTMENT OF MINES AND ENERGY ADELAIDE

SHEET 6833 ZONE 54

AUSTRALIA 1:100 000



HEAD STATION, OUT STATION, HUT
NATIONAL ROUTE NUMBER
HIGHWAY OR MAIN ROAD
SECONDARY ROAD
TRACK
TRACK ALONG BOUNDARY FENCE
RAILWAY AND STATION
RAILWAY AND SIDING
MAJOR ROAD BRIDGE, RAILWAY BRIDGE
BOUNDARY FENCE
INTERNAL FENCE
VERMIN PROOF, DOG FENCE — V.P.F. D.F.
POWER TRANSMISSION LINE
MINERAL FEATURES
MINOR MINERAL OCCURRENCE, PROSPECT
MINE, ALLUVIAL WORKINGS
OPEN CUT, QUARRY
YARD
TRIG-STATION, ASTRONOMICAL STATION
IDENTIFIED HILL OR MOUNTAIN, CAIRN, PILE
SPOT ELEVATION
CONTOURS, DEPRESSION CONTOURS
ESCARPMENT
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RIVER, CREEKS
BRAIDED STREAM WITH FLOOD CHANNEL
FLOOD PLAIN BOUNDARY
CLAYPAN, SALTPAN (PLAYA LAKE), SWAMP
BORE, WELL
TANK
ARTESIAN BORE
SPRING
WATERHOLE
DAM

1:100 000 SHEET INDEX

WINNININNIE	OLARY	MINGARY
	OLARY	
YUNTA	ANABAMA	OAKVALE

DEPARTMENT OF MINES AND ENERGY

SCALE 1:100 000

KILOMETRES 2 1 0 2 4 6 8 10 12 KILOMETRES

UNIVERSAL TRANSVERSE MERCATOR PROJECTION.
HORIZONTAL DATUM: AUSTRALIAN GEODETIC GRID 1966.
GRID LINES ARE 10000-METRE INTERVALS OF THE AUSTRALIAN MAP GRID.

Compiled from material supplied by Division of National Mapping, Canberra

Prepared by the Drafting Branch for use within the SA Department of Mines and Energy.

LOCALITY PLAN

SOUTH AUSTRALIA

251 × Rock Chip Sample Location

EQUINOX RESOURCES NL

GEOLOGY AND SAMPLE LOCATION MAP

WINNININNIE 1:100,000 SHEET

Author:	C.S.T.	Scale:	100,000
Date:	Sep-95	No:	ENCLOSURE 4

8970-4

8970-5

139° 00'

139° 30'

140° 00'

32° 30'

RED HILL
EL1962

MANNA HILL
EL1961

Pw

Pu

Pb

Pk ?

Helene
Cu Shaft

Erina Prospect

Johnsons Gully
Alluvial Field

TEETULPA GOLDFIELD

Burrumbie
Au Mine

MANNA HILL GOLDFIELD

Royal Charlie
Mine

Birthday Mine

Elsie May Mine

Westward Ho! Mine

Eudunda
Hope Mine

Trojan Mine

Nectar Mine

No Gammon Mine

Homeward Bound Mine

Jacksons Mine

Odd Trick Mine

Euro Mine

Three Blocks
Ag - Pb Mine

Nob
Cu Mine

LEGEND

UPPER PROTEROZOIC
(MID PROTEROZOIC)

- Pk — Callana group
- Pw — Wilpena group
- Pu — Umberatana group
- Pb — Burra Group

- Major formation boundary
- Lithological trend
- Aeromagnetic trend line
- Joint, fracture, vein
- Discontinuity - "Early" layer parallel thrust
- Discontinuity - "Late" high angle reverse fault
- Discontinuity - Undifferentiated fault, shear, or thrust
- Discontinuity - Inferred or approximate
- Strike and dip of bedding
- Synclinal axis
- Anticlinal axis
- Mine, working, significant mineral occurrence
- Tenement boundary

N

0 1 2 5 10km

Scale 1:100000

8970-5

Equinox Resources N.L.

PROJECT: **Manna Hill - Red Hill**

TITLE: **AEROMAGNETIC INTERPRETATION MAP**

COMPILED	SCALE	DATE REVISED	PLATE
C. Tomich	1 : 100,000		
DRAWN	DATE	Enclosure No.	
	July 1995	5	