DEPARTMENT OF MINES AND ENERGY
GEOLOGICAL SURVEY
SOUTH AUSTRALIA

REPORT BOOK 93/44

YEELANNA RC DRILLHOLE PROJECT: WELL COMPLETION REPORT

by

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Regional Geology

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Abstract

A total of 26 RC drillholes were completed in a NW-SE transect across a region of folded Archaean - Palaeoproterozoic orthogneisses and granitoids in the Cummins - Yeelanna region, southern Eyre Peninsula. It is unknown at present whether this sequence is part of the Sleaford Complex (ca. 2700-2200Ma) or the slightly younger Miltaie Gneiss (ca.1990Ma). Although base metal values in the sequence were low, several isolated Au anomalies (up to 12ppb) were discovered. The Sleaford Complex and Miltalie Gneiss of the southern Gawler Craton have some prospectivity for Au mineralisation, possibly associated with minor late-stage fractures.

INTRODUCTION

Project Objectives

The drilling programme was conceived to promote further exploration for base and precious metals within the southern Gawler Craton (Fig.1).

Strategy

A transect of up to 40 RC drillholes was proposed to test a region of N-S trending magnetic features suspected to be a zone of folded Palaeoproterozoic metasediments concealed by up to 100 metres of Cainozoic sediments (Figs 2 and 3). The drillholes were to test the nature of the basement, and to examine the mineral potential of the region. The drillhole traverse was located to compliment stratigraphic drilling proposed by Western Mining Corporation to the east on EL 1613.

Geological Rationale

The Palaeoproterozoic Hutchison Group within the southern Gawler Craton has attracted considerable interest in the past for exploration for Broken Hill and Balmatt-Edwards style stratiform base metal mineralisation. The potential for the sequence to host major base and precious metal mineralisation is high: numerous historical Cu, Pb and Ag deposits are known (e.g. Miltalie Mine (Parker, 1983; Parker *et al.*, 1988), Burrawing and Lady Franklin Mines (Rankin and Parker, in prep.)), and the discovery by Billiton Australia of the Menninnie Dam Pb-Zn-Ag prospect in the 1980's (Higgins *et al.*,1990) indicates the presence of major subsurface mineralisation.

However, apart from some notable exceptions, exploration has concentrated on areas with considerable outcrop. Large areas with only thin cover, such as the area of interest for this project, have largely been neglected as far as exhaustive, detailed exploration is concerned.

Current detailed mapping of the LINCOLN 1:250 000 mapsheet (Rankin and Parker, in prep.) has highlighted significant structural complexity within the exposed Archaean - Palaeoproterozoic sequence of the region.

Although this may increase the difficulty of exploration in areas of limited outcrop, the combination of intense folding and faulting has produced a thickened potential host rock sequence with a secondary fluid conduit system (major faults) present, dramatically increasing the potential of the region.

Previous Work

The LINCOLN 1:250 000 mapsheet was originally mapped by Johns (1956), who provided a basic outline of the outcrop distribution of crystalline basement in the area.

Detailed mapping of the crystalline basement was not attempted until the 1970's, with several PhD research projects conducted in the Port Lincoln - Tumby Bay area (Coin, 1976; Mortimer, 1984). The stratigraphy of the metasedimentary sequences on the Eyre Peninsula was initially unravelled on the WHYALLA 1:250 000 mapsheet (Parker and Lemon, 1982; Parker, 1978, 1983). A brief summary of these investigations is given in Parker *et al.* (1988).

Detailed mapping of the basement on the Tumby Bay and Cummins 1:100 000 sheets was conducted by Pancontinental (1982) during exploration for base metals.

Several drillholes were completed in the area of the Yeelanna drillhole transect by Endeavour Oil (1972) during exploration for sedimentary - hosted uranium, and by CRAE during coal exploration (McBain, 1981) (see Fig. 4). Bottom - hole descriptions of basement lithologies were generally ambiguous, and do not allow distinction between Archaean and Palaeoproterozoic lithologies. This was due in part to completion of drillholes within deeply weathered profiles.

GEOLOGY

Regional Setting

LINCOLN lies near the southern extremity of the Gawler Craton, a large crystalline basement province consisting of variably deformed late Archaean to Mesoproterozoic rocks (Thomson, 1970; Parker *et al.*,1988; Fanning *et al.*,1988). Three tectonic megacycles have been recognised in the Gawler Craton (Fanning *et al.*,1988):

1. Late Archaean - Palaeoproterozoic: an Archaean volcano-sedimentary sequence complexly deformed, metamorphosed and intruded by granitoids during the Sleafordian Orogeny (*c.*2500-2300Ma). This is collectively known as the Sleaford Complex in the southern Gawler Craton.
2. Palaeoproterozoic: several discrete phases of sedimentation and volcanism (including the Hutchison Group in the Cleve Subdomain; Parker and Lemon, 1982), with associated magmatism (Lincoln Complex), deformation and metamorphism during the Kimban Orogeny. Sedimentation and magmatism were operative *c.* 2000-1600 Ma (Fanning *et al.*, 1988) but deformation and metamorphism were restricted largely to 1850-1700 Ma.
3. Mesoproterozoic: extensive anorogenic volcanism *c.*1590 Ma (Gawler Range Volcanics) with contemporaneous clastic and volcaniclastic sedimentation associated with contemporaneous granitoid plutonism (Hiltaba Suite).

The LINCOLN area has exposures of crystalline basement rocks from both megacycles 1 and 2.

Rocks of the Sleaford Complex are exposed in coastal and island areas south and west of Port Lincoln, and in the Marble Range area. These comprise garnetiferous paragneisses (+/- cordierite), hypersthene gneiss, augen gneiss and basic granulites of the Carnot Gneisses, layered quartzofeldspathic gneisses of the Massena Bay Gneiss and high level granitoids of the Dutton Suite. The Carnot and Massena Bay Gneisses were deformed and metamorphosed during the Sleafordian Orogeny. The Dutton Suite granitoids intruded these Archaean supracrustals during this deformation.

Lying temporally between the Sleaford Complex and the Palaeoproterozoic Hutchison Group is the Miltalie Gneiss - a sequence of ?orthogneisses and granitoids with a crystallisation age of *c.* 2000 Ma. These gneisses are sporadically exposed in intimate intercollation with Hutchison Group metasediments in the Lincoln Uplands, and as sheared relics within the Kalinjala Mylonite Zone.

The Hutchison Group was deposited unconformably onto the Sleaford Complex and Miltalie Gneiss as a sequence of clastic and chemical sediments. The basal Warrow Quartzite contains minor feldspar, muscovite and ocassionally sillimanite, and represents a sequence of fluvial to marginal marine quartz sand. The Warrow Quartzite crops out sporadically throughout the Lincoln Uplands, but is best exposed in the Marble Range, where it is folded with Archaean Dutton Suite granitoids.

In the Cowell - Cleve area to the north, the Warrow Quartzite is then overlain by a sequence of chemical sediments: dolomitic marble of the Katunga Dolomite, carbonate and oxide facies iron formations of the Lower Middleback Jaspilite (including cherty and haematitic quartzites, graphitic schist and minor calcsilicate schist and gneiss). The change from Katunga Dolomite and carbonate facies iron formation to oxide facies iron formation represents a deepening of the depositional basin. The Lower Middleback Jaspilite is then overlain by the Cook Gap Schist: a sequence of garnet - biotite - sillimanite rich schist representing a regression to clastic sedimentation. Concordant amphibolite bands within the schist have been interpreted as either sills or flows of tholeiitic basalt (Parker, 1978, 1983; Parker *et al.*, 1988). The Cook Gap Schist is overlain by carbonate and oxide facies iron formations of the Upper Middleback Jaspilite (haematitic banded quartzite, dolomitic marble, grunerite - tremoloite schist and calcsilicate gneiss). A second regressive cycle of clastic sedimentation is represented by the quartz - feldspar - biotite (+/- garnet) rich Yadnarie Schist. Locally on KIMBA, calcsilicate gneiss and rhyodacite volcanics of the Bosanquet Formation appear to grade upwards from the Upper Middleback Jaspilite (Rankin *et al.*,1988; Flint and Rankin, 1991).

On LINCOLN, recent mapping has indicated some differences in the stratigraphy of the Hutchison Group from that recorded above. Principally, the Lower Middleback Jaspilite, Cook Gap Schist and Upper Middleback Jaspilite are intimately interlayered with a thick sequence of amphibolite, amphibole schist, and quartz - diopside calcsilicate gneiss. This sequence (the Burrawing Amphibolite; Rankin, in prep.) is interpreted as a mixed basaltic volcanic and chemical sediment facies variation of the Middleback Subgroup of the Hutchison Group. The concordant amphibolites within the Cook Gap Schist in the Cowell - Cleve area are most likely equivalent to this sequence.

Both the Archaean and Palaeoproterozoic sequences were subsequently deformed and metamorphosed by three discrete pulses of deformation during the Kimban Orogeny (*c.* 1850 - 1700 Ma). This produced metamorphic assemblages up to upper amphibolite facies, associated with two mappable generations of open to isoclinal folding (F2 and F3).

Associated with the separate pulses of the Kimban Orogeny was the intrusion of several suites of granitoids. The Donington Granitoid Suite (*c.* 1850 ma), exposed along the coast and islands from West Point to Port Neill, comprises numerous phases of intrusives, ranging from gabbronorite to enderbite and leucogranite. Spectacular dolerite dykes (the Tournefort Dyke Swarm) are common throughout exposures of the Donington Granitoid Suite. Intrusive contacts between the Donington Granitoid

Suite and the Hutchison Group are not seen; tectonic juxtaposition of the two units is observed along the Kalinjala Mylonite Zone.

Syn-D2 granite was intruded within the Hutchison Group in the Cowell - Cleve area (the Middlecamp Granite: Parker, 1983), but a discrete equivalent has not been recognised in the LINCOLN area. Post-D2 to syn-D3 granitoids intrude the Hutchison Group in the Lincoln Uplands, and are collectively known as the Moody Suite.

Crustal - scale shearing was also associated with D3, producing a suite of major shaear zones. The best exposed of these (the Kalinjala Mylonite Zone) extends from south of Port Lincoln northwards past Lake Gilles.

Variable erosion and sedimentation during the Cainozoic in the Eyre Peninsula region has left the Gawler Craton only partly exposed and variably weathered. West of the Lincoln Uplands, variable thicknesses of Tertiary fluvial to marine sediments were deposited in the Cummins, Uley and Wanilla groundwater basins. Closely associated with Teriary sedimentation was the development of regolithic laterite horizons on the crystalline basement. Later sedimentation during the Pleistocene included deposition of variable thicknesses aeolian calcarenites of the Bridgewater Formation, gypsiferous lacustrine sediments and thin veneers of alluvial and fluvial sediments.

Local Geology

Within the area of the drillhole project, thin veneers of Quaternary-Tertiary sediment (Uley Formation)overly Eocene sediment (Wanilla Formation) and regolith, which in turn blanket weathered basement. No Precambrian rocks are exposed in the area: the nearest outcrop of crystalline basement occurs approximately 7 kms to the east. The surficial geology is dominated by thin calcareous soil and calcrete developed on khaki-orange mottled clay. A series of salt lakes and depressions in the area contain thin deposits of organic-rich black-brown mud and clay, with minor evaporites.

GEOPHYSICS

The drilling transect was chosen to traverse a zone of N-S trending linear magnetic features evident in the regional magnetic data. A ground magnetic survey was undertaken along the selected traverse by L. Rankin and M. Flintoff using two Overhauser GSM 19 magnetometers.

One magnetometer was set as a base station and automatically recorded the magnetic field every 60 seconds. A 22 km line was walked by one operator, with readings taken every 20 metres. Distances between readings were paced, and regularly checked against vehicle odometer readings every 100 metres. Survey pegs were placed every 100 metres along the line.

The raw data were plotted, without correction of the traverse for diurnal variation (see Appendix A). From the plots, a total of 35 drilling targets were selected to provide sampling of as many variations in the magnetic texture of the traverse as possible. The target sites were then located along the traverse with respect to the survey pegs and both pegged and recorded by GPS.

Location data for all holes drilled are compiled in Appendix B, and detailed locations are shown on Fig 5.

DRILLING

Sampling

Drilling was conducted with the Department's Investigator RC drillrig, using NQ drillrod and watermist. Samples were collected every 2 metres until fresh basement was intersected. Drilling was then continued until either a piece of fresh core or adequate quantities of drillchips were collected. Samples were collected in plastic sample jars and stored in core trays. Bottom hole samples were bagged ready for geochemical and petrological analysis. A seperate bulk sample (up to 1 kg) of cuttings from the weathered basement horizon was also collected for geochemical analysis. This sample was often a composite from several metres.

Drilling Conditions

Drilling of the Pleistocene calcrete and clay horizons at the top of each hole was relatively straightforward. Drilling became generally more difficult within the interlayered Tertiary sandy clays and sands, with problems encountered with stuck rods and collapsing holes within intervals of saturated fine to very fine - grained unconsolidated quartz sand. This was overcome by using abundant polymer downhole. Only one drillhole (RC 5) was abandoned prior to reaching basement.

The programme was plagued with breakdowns of the Investigator rig, which delayed completion of the programme by approximately 5 weeks. Combined with a lack of variation in the basement stratigraphy, it was decided to shorten the programme by a total of 9 holes.

Two drillholes (RC 5 and 26) were completed as groundwater observation bores, cased to a depth of approximately 12m each.

DRILLING RESULTS - BASEMENT LITHOLOGIES

Depth to basement was variable across the transect, with a range of 10 - 38 meters to top of weathered basement. Thickness of the regolith varied from 2 to 48 metres. Detailed and summary stratigraphic logs for each hole are compiled in Appendix C. Detailed petrological descriptions of both fresh bottom-hole basement samples and regolithic profiles are compiled in Appendix D. The following is a summary of the basement lithologies intersected for each drillhole (a summary cross section for the drilling transect is shown in Fig 6):

RC 1: fine-grained quatzofeldspathic gneiss with minor biotite + muscovite (+/-sillimanite). Protolith was most likely a granite with S-type characteristics (high Al).

RC2: medium-grained leucocratic gneiss with minor biotite, intersected by minor biotite - chlorite (+/-sphene) shears. Interpreted as highly deformed granite.

RC3: grey, fine to medium-grained granitic gneiss, with minor biotite + muscovite. Minor brittle fracturing evident.

RC4: grey, fine to medium-grained granite gneiss. Localisation of biotite into foliae has occurred during intense deformation.

RC6: grey, fine, even-grained granite with minor biotite. A weak foliation is evident, with most strain localised within microshears.

RC7: grey, fine-grained granitic gneiss, with a weak foliation defined by alignement of minor biotite.

RC8: dark grey, fine-grained plagioclase-hornblende-biotite gneiss. Interpreted as a deformed intermediate (?tonalitic) granitoid

RC9: Dark, fine-grained amphibolite, well foliated. Interpreted as a deformed intermediate granitoid to mafic intrusive

RC12: Grey, fine-grained plagioclase-biotite gneiss. Interpreted as a deformed intermediate intrusive.

RC13: fine-grained hornblende-biotite quartzofeldspathic gneiss. Alteration includes chlorite and carbonate replacement of mafic minerals. Interpreted as a deformed granitoid.

RC14: grey, fine-grained granitic gneiss. A weak foliation is defined by alignment of biotite.

RC16: grey, fine to medium-grained granite gneiss. Intersected by minor microshears.

RC17: fine to medium-grained leucocratic, quatrz-rich granitic gneiss, with minor biotite.

RC18: grey, leucocratic medium-grained gneiss. Interpreted as a highly deformed granite.

RC20: fine-grained cream-pink granitic gneiss. Narrow microshears are parallel to a subvertical foliation.

RC22: grey, medium-grained pegmatitic granite gneiss. Biotite is rare.

RC24: regolithic sandy clay (kaolin), developed on a granitoid or granitoid gneiss.

RC26: leucocratic granite gneiss, with minor microshears and dynamic recrystallisation of the metamorphic foliation.

RC28: regolithic sandy clay, with primary chaotic gneissic textures evident in thin section.

RC29: fine to medium-grained granitic to tonalitic gneiss, intersected by minor shear zones.

RC31: unsorted colluvial to regolithic clay, most likely developed on weathered granitic to intermediate orthogneiss.

RC32: pink, medium-grained granitic gneiss.

RC33: grey, fine-grained granitic gneiss. The regional foliation is overprinted by a variable-intensity foliation.

RC34: grey, fine-grained quartzofeldspathic biotite gneiss. Well foliated.

RC35: grey, fine-grained granitic gneiss with minor biotite and muscovite. A weak foliation is defined by the alignment of micas.

In summary, the basement lithologies intersected in the Yeelanna RC drillholes represent a sequence of variably deformed granitic to intermediate intrusives, ranging from leucocratic and pegmatitic granite to ?tonalite and diorite/gabbro.

A regional prograde (upper amphibolite) metamorphism associated with regional deformation has produced a variable-intensity foliation, with subsequent deformation producing localised shears and a weak foliation, with associated retrograde metamorphism to lower amphibolite-greenschist facies.

GEOCHEMISTRY

Methods

Samples of each of the fresh basement intersections were analysed for both whole - rock silicates and trace elements. Composite samples of regolithic horizons for each drillhole that intersected basement were analysed for selected trace elements to test for any secondary enrichment of metals in the weathered profile.

Results

The orthogneisses and granitoids generally exhibit low values for both base and precious metals. Cu is generally <45ppm, Pb <55ppm and Zn <65ppm. Sample 6029 RS 282 has a weakly elevated Zn content (360ppm). Pt and Pd are both below detection limits (<5ppb and <1ppb respectively). Au is generally below detection limits, although 5 samples have detectable Au, with a maximum value of 10ppb in 6029 RS 276.

The regolithic clays are also generally low in base and precious metals; Zn shows slight enrichment in the regolith (maximum value of 410ppm in 6029 RS 228). Au is generally below detection limit within the regolith, although 6029 RS 289b has an anomalous value of 12ppb.

Detailed analyses are compiled in Appendix E.

DISCUSSION

Tectonic Synthesis

The orthogneisses and granitoids intersected within the Yeelanna RC drillholes are interpreted as either part the Archaean Sleaford Complex, or the Palaeoproterozoic Miltalie Gneiss. A sample of leucocratic gneiss from RC2 has been submitted for U-Pb zircon geochronological analysis to allow a confidant correlation; results from this study will be reported when complete.
The regional magnetic signature of the package indicates at least one and possibly two generations of folding of the orthogneissic complex on a macroscopic scale (see Fig 7). Repetition of the mafic gneiss unit in the eastern half of the transect is interpreted as part of the macroscopic fold pattern of the area. The difference in character of the magnetics from the surrounding, generally low - intensity magnetics indicates that the units represent a distinctly different sequence from that of the surrounding Sleaford Complex.

The most magnetic horizon in the area, lying just north of the Yeelanna transect, was intersected by Endeavour Oil Co. (1972), revealing granitoid gneiss. One CRAE drillhole (81CBR5: McBain,1981) drilled on the margin of this horizon intersected a weathered biotite - rich lithology interpreted by McBain (1981) as Hutchison Group metasediment. Although this intersection may represent a minor folded/faulted sliver of Hutchison Group surrounded by orthogneissic basement, it is more likely that the biotite - rich unit represents a more schistose horizon within the orthogneiss. Similar biotite - rich horizons were encountered in several of the Yeelanna drillholes within the regolith, with granitic gneiss intersected at the bottom of the holes.

Mineral Potential

The orthogneiss/granitoid sequence has generally low metal values, and are not considered as a highly potential host for base metal mineralisation. However, the presence of minor isolated anomalous Au values suggests that the sequence may be a potential host for primary and/or secondary Au mineralisation. This is important for exploration strategies in the southern Eyre Peninsula, as the Sleaford Complex occurs over a large area of the southern Gawler Craton (typically in the subsurface), and correlatives of the Miltalie Gneiss are exposed in both the Tumby Bay - Pt Lincoln area (Rankin and Parker, in prep.) and the Cowell - Mangalo area (Parker, 1983).

ACKNOWLEDGEMENTS

The assistance of John Parker is gratefully acknowledged, both for the initial project concept and for well-siting and logging of RC 14, 16, 17, 18, 22, 24, 28, 29, 31, 32, 33, 34, and 35. Some alterations to well-site logs were made by the author subsequent to petrological examinations.

Drilling was ably conducted by the DME Drilling Branch, and field assistance was provided by Mark Flintoff, Neil Gray and Rod South (Mineral Resources Branch).

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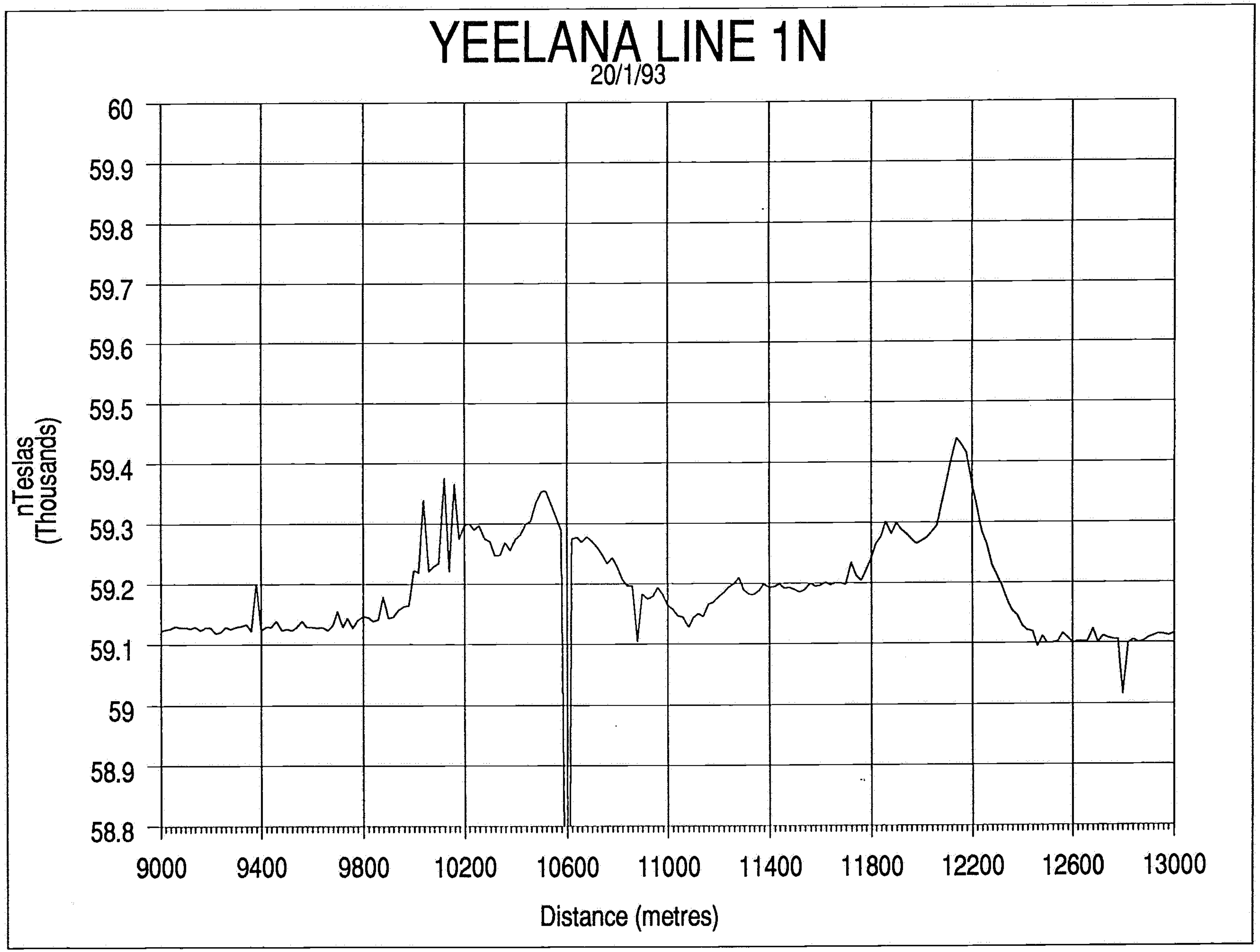
APPENDIX A

YEELANNA LINE 1N GROUND MAGNETIC PROFILES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Distance (metres)

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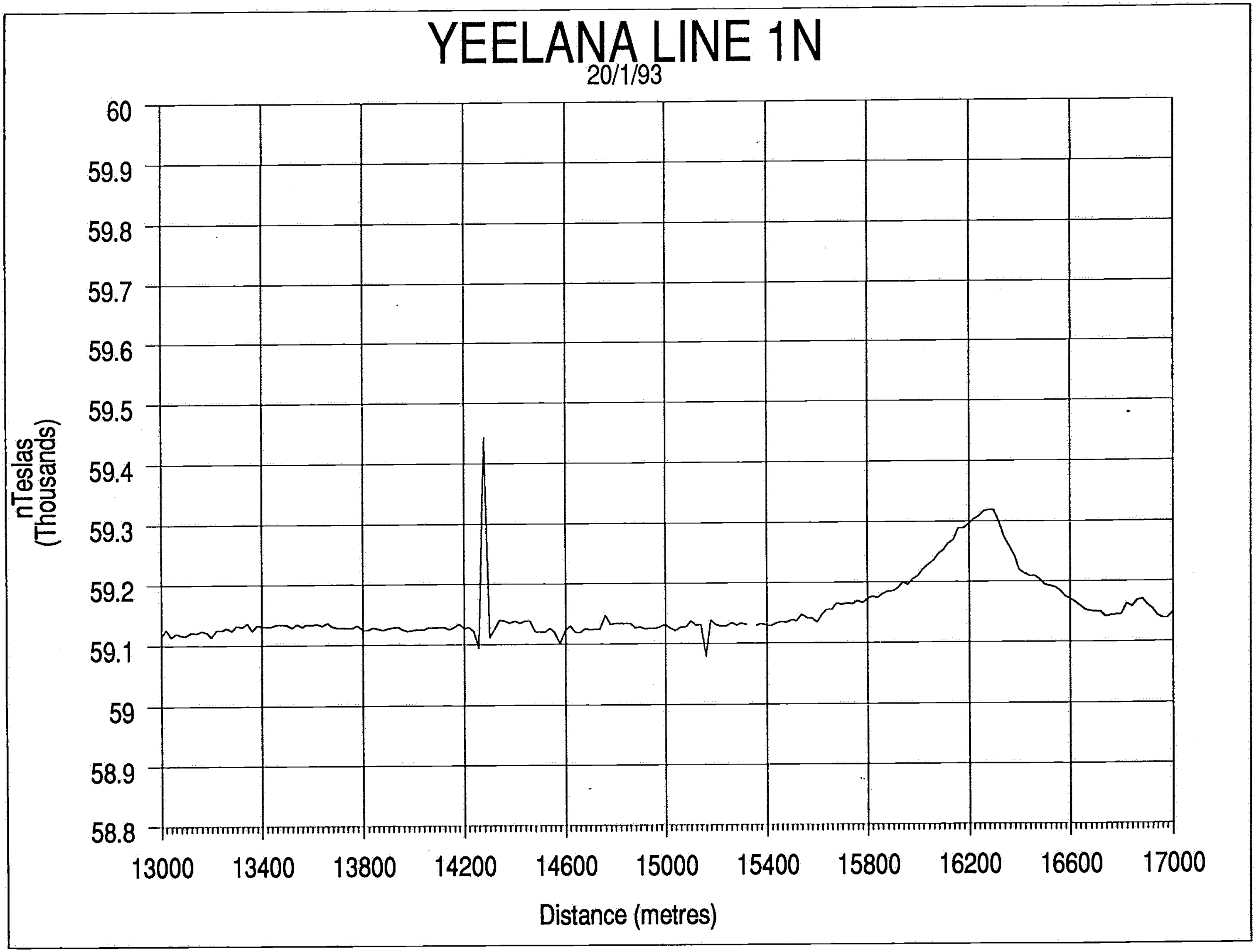
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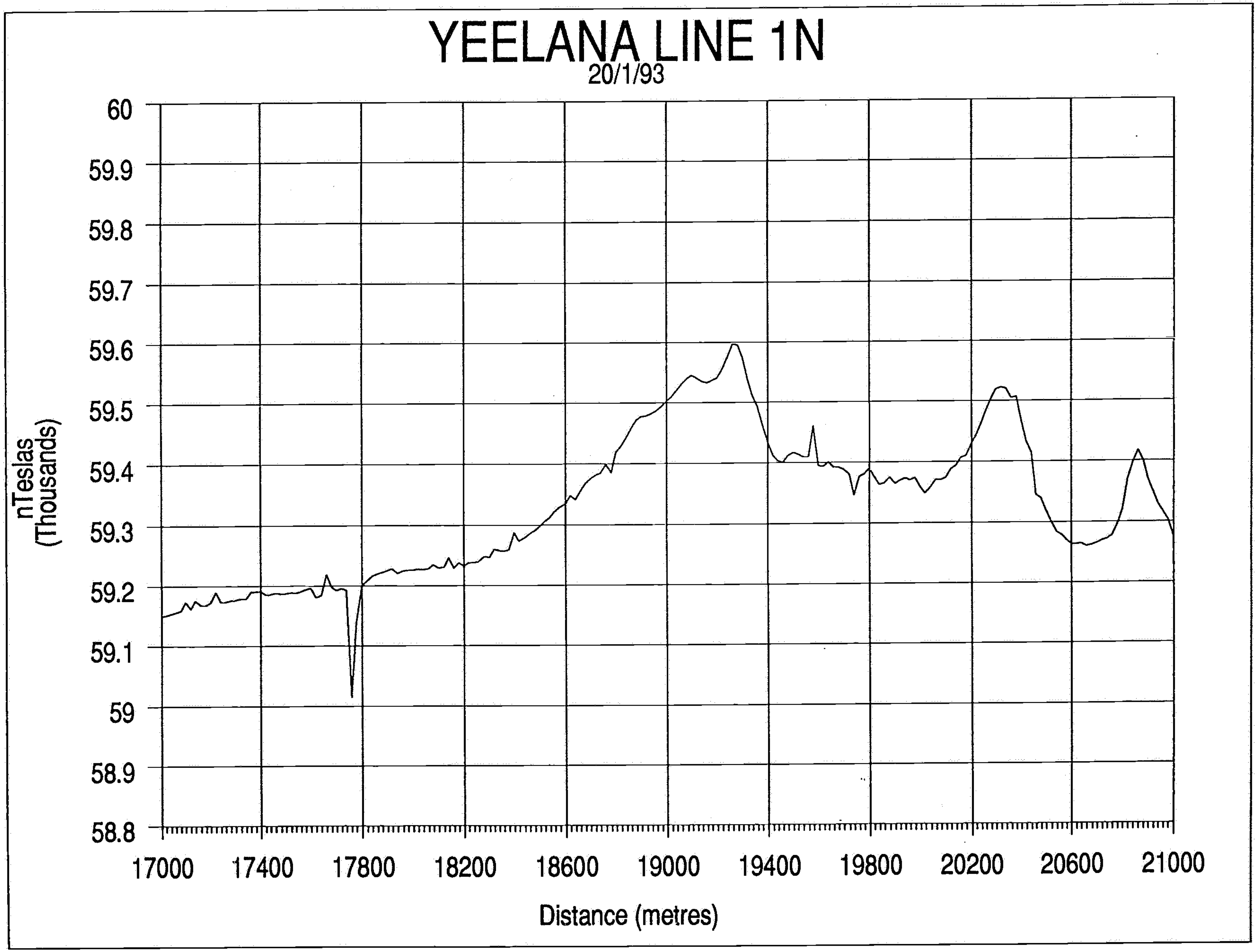
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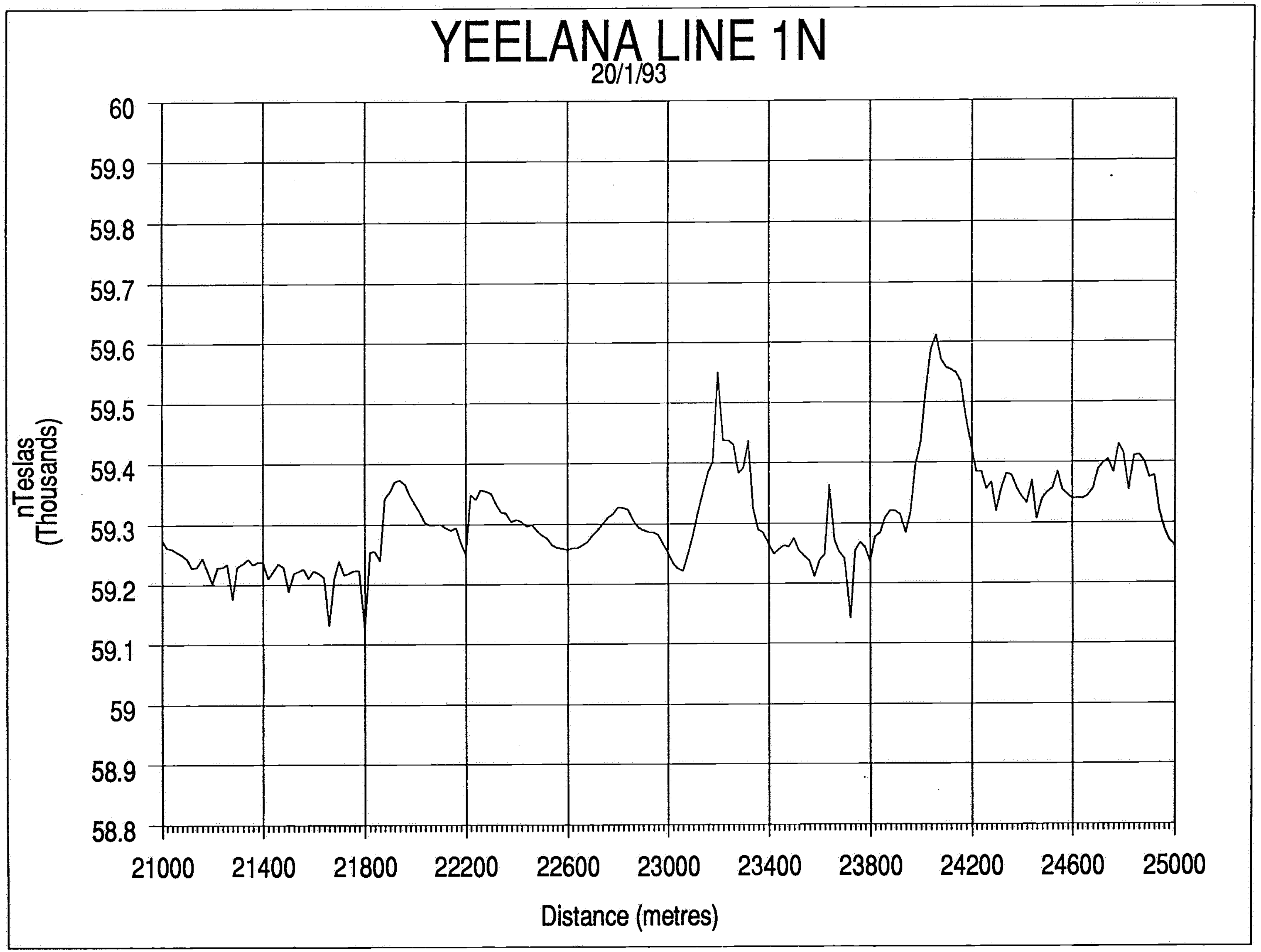
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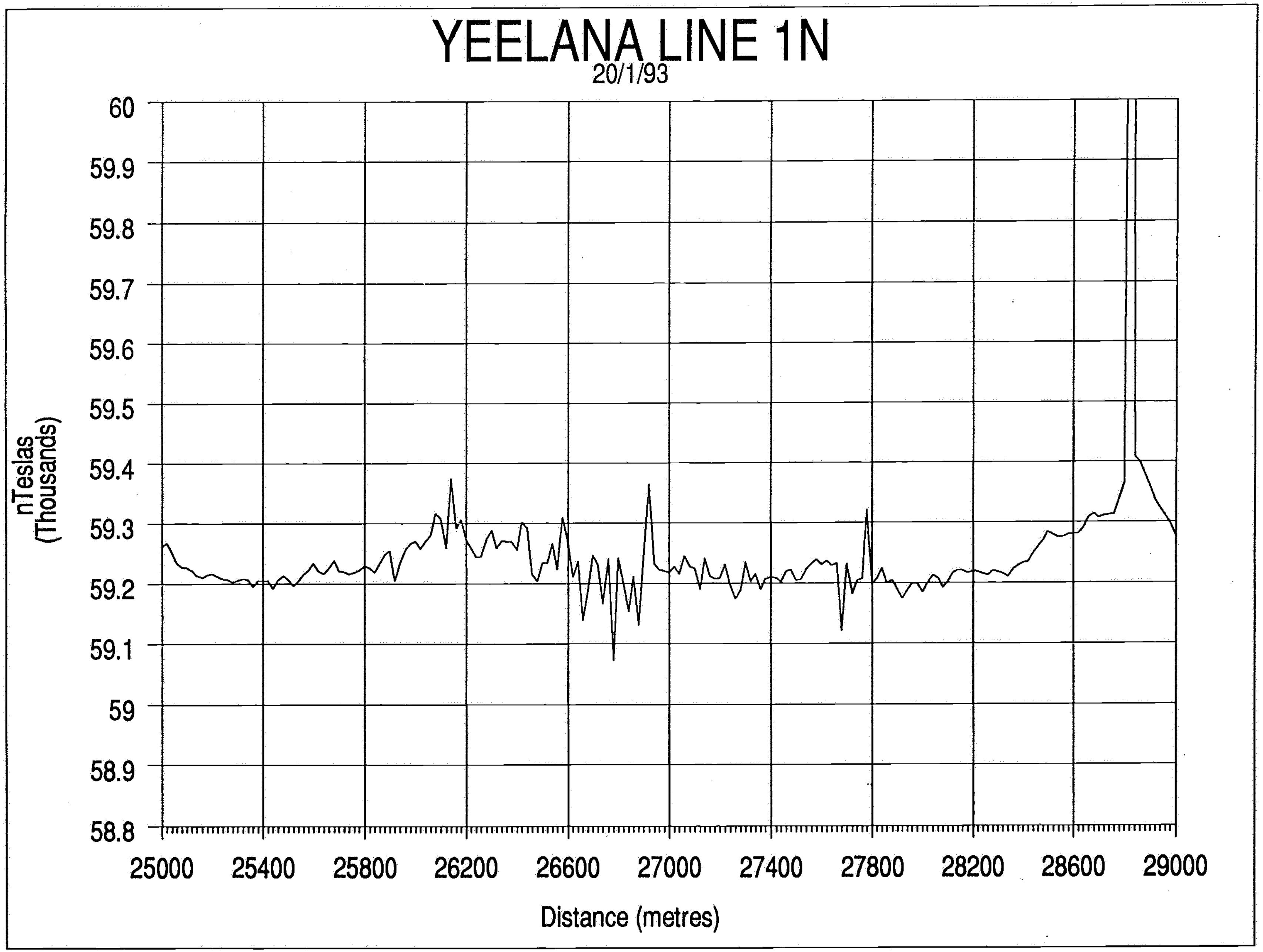
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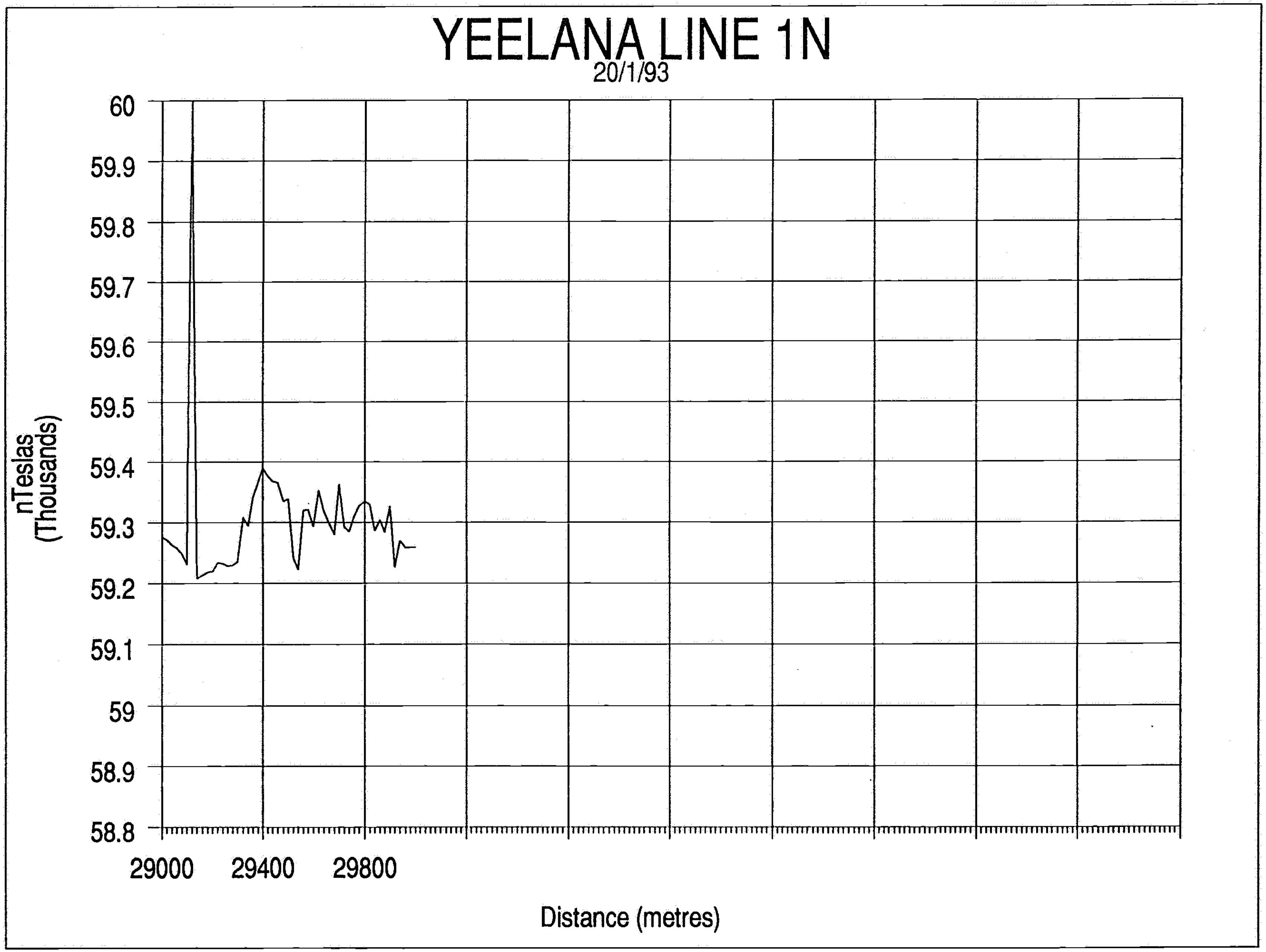
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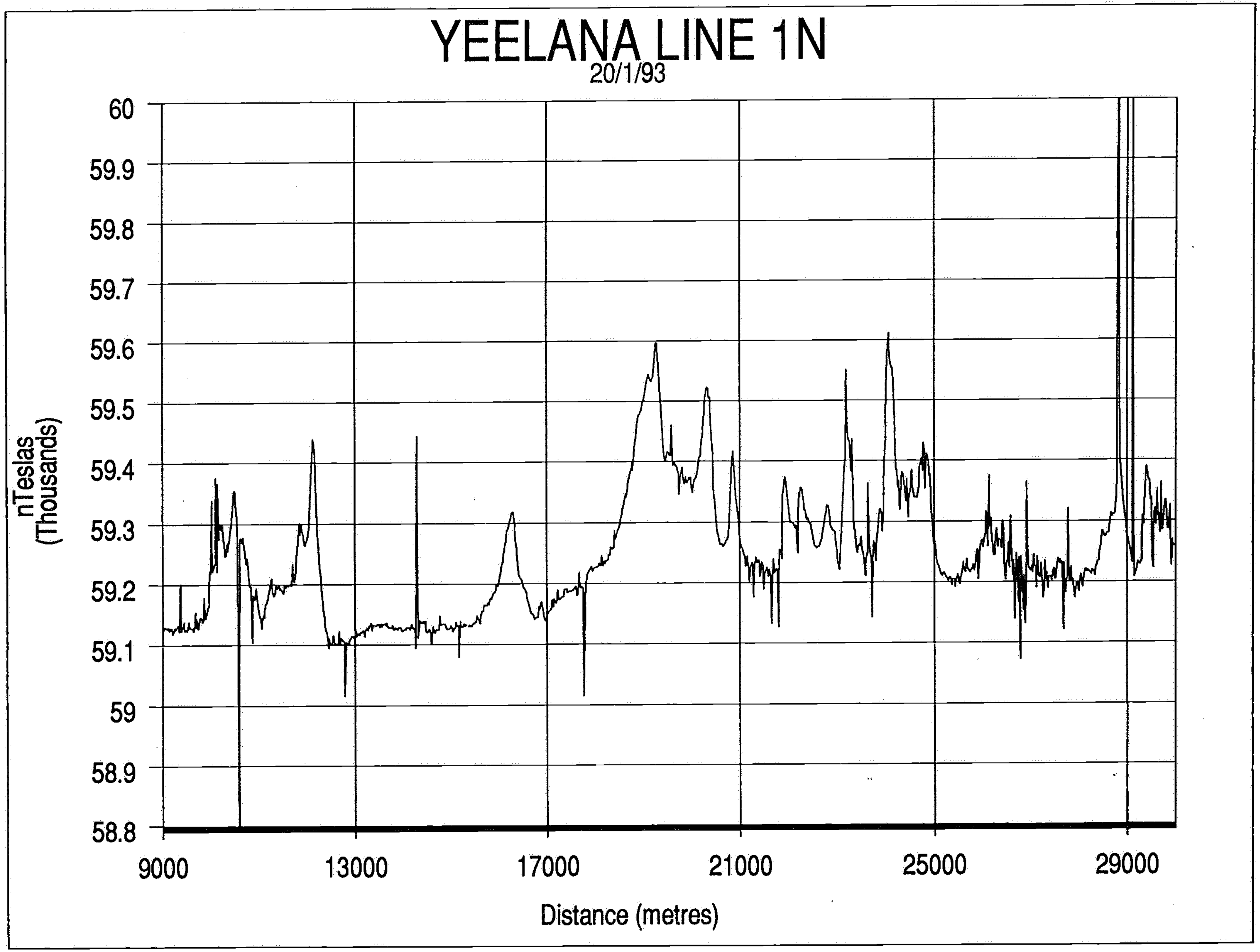

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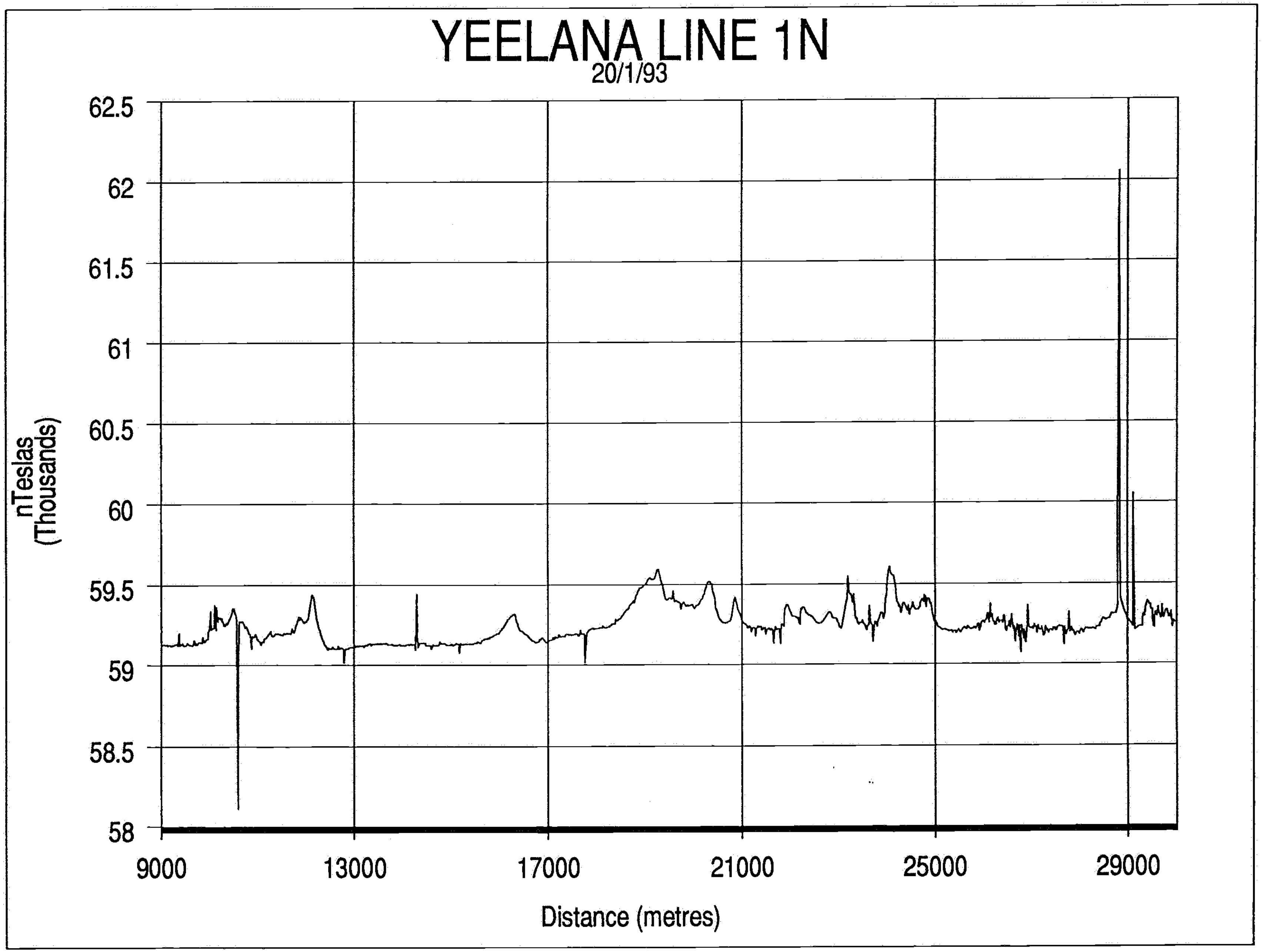
59.6
59.5
59.4
59.3
59.2
59.1
59
58.9
58.8
9000
13000
17000
21000
25000
29000
Distance (metres)

7


YEELANA LINE 1N
20/1/93
nTeslas (Thousands)
62.5
62
61.5
61
60.5
60
59.5
59
58.5
58
9000
13000
17000
21000
25000
29000
Distance (metres)

APPENDIX B

DRILLHOLE LOCATION DATA

Drillhole: YEELANNA RC 1

Lease : 0

Map : 6029 UnitNo : 1083

Location_Type : Lat/Long Decimal Degrees

Lat_or_Northing : -34.1010

Long_or_Easting : 135.6869

Zone : 53

Depth(m), Start: 0.00 Max : 55.00

Dip_at_Collar: -90.00 Azimuth :

Class : SW

Operator : DME

Completion_Date : 05/02/93

Checkedby : L R RANKIN

Checkdate : 02/05/93

Drillhole: YEELANNA RC 2

Lease : 0

Map : 6029 UnitNo : 1084

Location_Type : Lat/Long Decimal Degrees

Lat_or_Northing : -34.0955

Long_or_Easting : 135.6794

Zone : 53

Depth(m), Start: 0.00 Max : 82.00

Dip_at_Collar: -90.00 Azimuth :

Class : SW

Operator : DME

Completion_Date : 03/05/93

Checkedby : L RANKIN

Checkdate : 29/06/93

Drillhole: YEELANNA RC 3

Lease : 0

Map : 6029 UnitNo : 1085

Location_Type : Lat/Long Decimal Degrees

Lat_or_Northing : -34.0912

Long_or_Easting : 135.6738

Zone : 53

Depth(m), Start: 0.00 Max : 57.50

Dip_at_Collar: -90.00 Azimuth :

Class : SW

Operator : DME

Completion_Date : 25/05/93

Checkedby : L R RANKIN

Checkdate : 25/05/93

Drillhole: YEELANNA RC 4

Lease : 0

Map : 6029 UnitNo : 1086

Location_Type : Lat/Long Decimal Degrees

Lat_or_Northing : -34.0868

Long_or_Easting : 135.6677

Zone : 53

Depth(m), Start: 0.00 Max : 68.00

Dip_at_Collar: -90.00 Azimuth :

Class : SW

Operator : DME

Completion_Date : 26/05/93

Checkedby : L RANKIN

Checkdate : 29/06/93

Drillhole: YEELANNA RC 5

Lease : | 0

Map : 6029 *UnitNo :* 1087

Location_Type : Lat/Long Decimal Degrees

Lat_or_Northing : -34.0809

Long_or_Easting : 135.6600

Zone : 53

Depth(m), Start: 0.00 Max : 30.00

Dip_at_Collar: -90.00 *Azimuth :*

Class : SW

Operator : DME

Completion_Date : 26/05/93

Checkedby : L RANKIN

Checkdate : 30/05/93

Drillhole: YEELANNA RC 6

Lease : | 0

Map : 6029 *UnitNo :* 1088

Location_Type : Lat/Long Decimal Degrees

Lat_or_Northing : -34.0749

Long_or_Easting : 135.6523

Zone : 53

Depth(m), Start: 0.00 Max : 65.50

Dip_at_Collar: -90.00 *Azimuth :*

Class : SW

Operator : DME

Completion_Date : 27/05/93

Checkedby : L RANKIN

Checkdate : 29/06/93

Drillhole: YEELANNA RC 7

Lease : | 0

Map : 6029 *UnitNo :* 1089

Location_Type : Lat/Long Decimal Degrees

Lat_or_Northing : -34.0734

Long_or_Easting : 135.6506

Zone : 53

Depth(m), Start: 0.00 Max : 51.00

Dip_at_Collar: -90.00 *Azimuth :*

Class : SW

Operator : DME

Completion_Date : 27/05/93

Checkedby : L RANKIN

Checkdate : 30/06/93

Drillhole: YEELANNA RC 8

Lease : | 0

Map : 6029 *UnitNo :* 1090

Location_Type : Lat/Long Decimal Degrees

Lat_or_Northing : -34.071

Long_or_Easting : 135.6467

Zone : 53

Depth(m), Start: 0.00 Max : 47.50

Dip_at_Collar: -90.00 *Azimuth :*

Class : SW

Operator : DME

Completion_Date : 28/05/93

Checkedby : L RANKIN

Checkdate : 30/06/93

Drillhole: YEELANNA RC 9

Lease : 0

Map : 6029 *UnitNo :* 1091

Location_Type : Lat/Long Decimal Degrees

Lat_or_Northing : -34.0699

Long_or_Easting : 135.6438

Zone : 53

Depth(m), Start: 0.00 Max : 14.00

Dip_at_Collar: -90.00 *Azimuth :*

Class : SW

Operator : DME

Completion_Date : 29/05/93

Checkedby : L RANKIN

Checkdate : 30/06/93

Drillhole: YEELANNA RC 12

Lease : 0

Map : 6029 *UnitNo :* 1092

Location_Type : Lat/Long Decimal Degrees

Lat_or_Northing : -34.0664

Long_or_Easting : 135.6348

Zone : 53

Depth(m), Start: 0.00 Max : 18.00

Dip_at_Collar: -90.00 *Azimuth :*

Class : SW

Operator : DME

Completion_Date : 30/05/93

Checkedby : L RANKIN

Checkdate : 29/06/93

Drillhole: YEELANNA RC 13

Lease : 0

Map : 6029 *UnitNo :* 1093

Location_Type : Lat/Long Decimal Degrees

Lat_or_Northing : -34.0636

Long_or_Easting : 135.6317

Zone : 53

Depth(m), Start: 0.00 Max : 62.00

Dip_at_Collar: -90.00 *Azimuth :*

Class : SW

Operator : DME

Completion_Date : 05/06/93

Checkedby : L RANKIN

Checkdate : 29/06/93

Drillhole: YEELANNA RC 14

Lease : 0

Map : 6029 *UnitNo :* 1094

Location_Type : Lat/Long Decimal Degrees

Lat_or_Northing : -34.0617

Long_or_Easting : 135.6289

Zone : 53

Depth(m), Start: 0.00 Max : 25.50

Dip_at_Collar: -90.00 *Azimuth :*

Class : SW

Operator : DME

Completion_Date : 03/06/93

Checkedby : L RANKIN

Checkdate : 30/06/93

Drillhole: YEELANNA RC 16

Lease : 0

Map : 6029 *UnitNo :* 1095

Location_Type : Lat/Long Decimal Degrees

Lat_or_Northing : -34.0594

Long_or_Easting : 135.6226

Zone : 53

Depth(m), Start: 0.00 Max : 27.70

Dip_at_Collar: -90.00 *Azimuth :*

Class : SW

Operator : DME

Completion_Date : 03/06/93

Checkedby : L RANKIN

Checkdate : 01/07/93

Drillhole: YEELANNA RC 17

Lease : 0

Map : 6029 *UnitNo :* 1096

Location_Type : Lat/Long Decimal Degrees

Lat_or_Northing : -34.0566

Long_or_Easting : 135.6191

Zone : 53

Depth(m), Start: 0.00 Max : 45.70

Dip_at_Collar: -90.00 *Azimuth :*

Class : SW

Operator : DME

Completion_Date : 04/06/93

Checkedby : L RANKIN

Checkdate : 01/07/93

Drillhole: YEELANNA RC 18

Lease : 0

Map : 6029 *UnitNo :* 1097

Location_Type : Lat/Long Decimal Degrees

Lat_or_Northing : -34.0521

Long_or_Easting : 135.6139

Zone : 53

Depth(m), Start: 0.00 Max : 25.00

Dip_at_Collar: -90.00 *Azimuth :*

Class : SW

Operator : DME

Completion_Date : 06/05/93

Checkedby : L RANKIN

Checkdate : 01/07/93

Drillhole: YEELANNA RC 20

Lease : 0

Map : 6029 *UnitNo :* 1098

Location_Type : Lat/Long Decimal Degrees

Lat_or_Northing : -34.0485

Long_or_Easting : 135.6077

Zone : 53

Depth(m), Start: 0.00 Max : 77.00

Dip_at_Collar: -90.00 *Azimuth :*

Class : SW

Operator : DME

Completion_Date : 29/05/93

Checkedby : L RANKIN

Checkdate : 01/07/93

Drillhole: YEELANNA RC 22

Lease :	0
Map :	6029
UnitNo :	1099
Location_Type :	Lat/Long Decimal Degrees
Lat_or_Northing :	-34.0419
Long_or_Easting :	135.6001
Zone :	53
Depth(m), Start:	0.00
Max :	39.70
Dip_at_Collar:	-90.00
Azimuth :	
Class :	SW
Operator :	DME
Completion_Date :	06/06/93
Checkedby :	L RANKIN
Checkdate :	01/07/93

Drillhole: YEELANNA RC 24

Lease :	0
Map :	6029
UnitNo :	1100
Location_Type :	Lat/Long Decimal Degrees
Lat_or_Northing :	-34.0376
Long_or_Easting :	135.5967
Zone :	53
Depth(m), Start:	0.00
Max :	71.50
Dip_at_Collar:	-90.00
Azimuth :	
Class :	SW
Operator :	DME
Completion_Date :	07/06/93
Checkedby :	L RANKIN
Checkdate :	01/07/93

Drillhole: YEELANNA RC 26

Lease :	0
Map :	6029
UnitNo :	1101
Location_Type :	Lat/Long Decimal Degrees
Lat_or_Northing :	-34.0314
Long_or_Easting :	135.5877
Zone :	53
Depth(m), Start:	0.00
Max :	25.00
Dip_at_Collar:	-90.00
Azimuth :	
Class :	SW
Operator :	DME
Completion_Date :	06/06/93
Checkedby :	L RANKIN
Checkdate :	01/07/93

Drillhole: YEELANNA RC 28

Lease :	0
Map :	6029
UnitNo :	1102
Location_Type :	Lat/Long Decimal Degrees
Lat_or_Northing :	-34.0229
Long_or_Easting :	135.5744
Zone :	53
Depth(m), Start:	0.00
Max :	65.50
Dip_at_Collar:	-90.00
Azimuth :	
Class :	SW
Operator :	DME
Completion_Date :	06/07/93
Checkedby :	L RANKIN
Checkdate :	01/07/93

Drillhole: YEELANNA RC 29

Lease : | 0

Map : 6029 *UnitNo :* 1103

Location_Type : Lat/Long Decimal Degrees

Lat_or_Northing : -34.0151

Long_or_Easting : 135.5629

Zone : 53

Depth(m), Start: 0.00 Max : 74.00

Dip_at_Collar: -90.00 *Azimuth :*

Class : SW

Operator : DME

Completion_Date : 08/06/93

Checkedby : L RANKIN

Checkdate : 01/07/93

Drillhole: YEELANNA RC 31

Lease : | 0

Map : 6029 *UnitNo :* 1104

Location_Type : Lat/Long Decimal Degrees

Lat_or_Northing : -34.0157

Long_or_Easting : 135.5312

Zone : 53

Depth(m), Start: 0.00 Max : 59.50

Dip_at_Collar: -90.00 *Azimuth :*

Class : SW

Operator : DME

Completion_Date : 08/06/93

Checkedby : L RANKIN

Checkdate : 01/07/93

Drillhole: YEELANNA RC 32

Lease : | 0

Map : 6029 *UnitNo :* 1105

Location_Type : Lat/Long Decimal Degrees

Lat_or_Northing : -34.0163

Long_or_Easting : 135.5277

Zone : 53

Depth(m), Start: 0.00 Max : 55.00

Dip_at_Collar: -90.00 *Azimuth :*

Class : SW

Operator : DME

Completion_Date : 09/06/93

Checkedby : L RANKIN

Checkdate : 02/07/93

Drillhole: YEELANNA RC 33

Lease : | 0

Map : 6029 *UnitNo :* 1106

Location_Type : Lat/Long Decimal Degrees

Lat_or_Northing : -34.0167

Long_or_Easting : 135.5210

Zone : 53

Depth(m), Start: 0.00 Max : 28.70

Dip_at_Collar: -90.00 *Azimuth :*

Class : SW

Operator : DME

Completion_Date : 08/06/93

Checkedby : L RANKIN

Checkdate : 02/07/93

Drillhole: YEELANNA RC 34	Drillhole: YEELANNA RC 35
Lease : 0	Lease : 0
Map : 6029	Map : 6029
UnitNo : 1107	UnitNo : 1108
Location_Type : Lat/Long Decimal Degrees	Location_Type : Lat/Long Decimal Degrees
Lat_or_Northing : -34.0171	Lat_or_Northing : -34.0179
Long_or_Easting : 135.5124	Long_or_Easting : 135.5003
Zone : 53	Zone : 53
Depth(m), Start: 0.00	Depth(m), Start: 0.00
Max : 39.00	Max : 24.80
Dip_at_Collar: -90.00	Dip_at_Collar: -90.00
Azimuth :	Azimuth :
Class : SW	Class : SW
Operator : DME	Operator : DME
Completion_Date : 08/06/93	Completion_Date : 04/06/93
Checkedby : L RANKIN	Checkedby : L RANKIN
Checkdate : 02/07/93	Checkdate : 02/07/93

APPENDIX C

DETAILED AND SUMMARY STRATIGRAPHIC DRILLHOLE LOGS

DRILLHOLE SUMMARY

Drillhole Name: YEELANNA RC 1	Map : 6029	UnitNo :1083	Class : SW
Completion Date :05/02/93	Dip at Collar : -90.00	Elev at Collar : 60.00	Drilling Method : RC
Max. Depth(m) : 55.00	Azimuth at Collar :	Water Cut Depth(m) :	

Log Type	Log Interpreter	Log Date
LITHOLOGY LOG	L RANKIN	02/05/93
SUMMARY STRAT. LOG	L RANKIN	29/06/93

Litho. From	Log To		Mag. Susc (SIUnits*1000)	Major Rock Type		Minor Rock Type		Lithology Description
0.00	2.00	M	0.29	SILT		CLAY		fawn silt, minor pisolitic Festone, grey-olive clay
2.00	4.00	M	0.19	CLAY		LATERITE		grey-olive clay, minor Festone clasts
4.00	6.00	M	0.08	CLAY		LATERITE		as above
6.00	8.00	M	0.06	CLAY		SAND		red-orange sandy clay, minor m gr Festone
8.00	10.00	M	0.09	SAND		CLAY		f-v f gr sand, orange clay, limon Festone
10.00	12.00	M	0.05	SAND		CLAY		f-v f gr qtz, minor clay
12.00	14.00	M	0.10	SAND		CLAY		orange f-v f gr qtz, minor clay
14.00	16.00	M	0.06	SAND		FERRICRETE		orange f gr qtz, grvl-sized ferricted clasts of sand
16.00	18.00	M	0.05	SAND		FERRICRETE		cream-white f gr qtz, grvl-size frags, partly ferricted
18.00	20.00	M	0.03	CLAY		SAND		brown-cream silty clay, minor f-m gr qtz
20.00	22.00	M	0.04	SAND		CLAY		f-v f gr qtz, white-cream clay. Grvl frags ferrcted m gr qtz
22.00	24.00	M	0.03	REGOLITH		CLAY		dk-light grey clay, minor f-v f gr qtz, v f gr mica
24.00	28.00	M	0.03	REGOLITH		CLAY		fawn-dk grey clay, abund mica, cs gr s/ang qtz
28.00	30.00	M	0.03	CLAY				grey clay, v f gr mica
30.00	32.00	M	0.01	REGOLITH		CLAY		grey clay, cs gr qtz, s/ang-ang, minor lithic frags
32.00	34.00	M	0.01	REGOLITH		CLAY		fawn clay, f-m gr qtz, minor lithioc frags
34.00	36.00	M	0.02	CLAY		REGOLITH		grey-dk grey silty micaceous clay, minor m-cs gr s/ang qtz
36.00	38.00	M	0.03	CLAY		REGOLITH		green-grey micac. clay, minor silty-f gr qtz
38.00	40.00	M	0.03	CLAY		REGOLITH		as above, minor cream kaolin
40.00	42.00	M	0.05	CLAY		REGOLITH		grey micac. clay, 15% cs gr-grvl s/ang smoky qtz, white fsp
42.00	44.00	M	0.08	CLAY		REGOLITH		m-cs gr grey s/ang qtz&fsp in grey micac clay
44.00	46.00	M	0.11	CLAY		REGOLITH		grey-fawn micac. clay, min m gr s/ang qtz&fsp
46.00	48.00	M	0.09	CLAY		REGOLITH		as above, abund biot
48.00	50.00	M	0.07	CLAY		REGOLITH		as above
50.00	52.00	M	0.20	REGOLITH		CLAY		m-cs gr ang-s/ang qtz&fsp. Min mica & clay

Litho. From	Log To		Mag. Susc (SIUnits*1000)	Major Rock Type		Minor Rock Type		Lithology Description
52.00	54.00	M	0.07	CLAY		REGOLITH		grey-cream micac clay, abund ang-s/ang fsp & qtz (cs-grvl)
54.00	55.00	M	0.14	GNEISS				m gr foliated qtz-fsp-bi-?ga gnss

Strat. From	Log To		Strat. Unit		Major Rock Type		Minor Rock Type		Lithology Description
0.00	8.00	M	TQau	?	CLAY		LATERITE		grey to orange silty clay, minor laterite fragments
8.00	22.00	M	Tbw	?	SAND		CLAY		v f-m gr qtz partly ferricted, minor cream clay
22.00	55.00	M	APs	?	GNEISS		CLAY		granodiorite gneiss, weathered

Rock From	Samples To		Map	RS No.	Strat Unit		Sample Type	Major Rock		Major Rock Modifier
48.00	54.00	M	6029	227	APs		CUTTINGS	CLAY		regolithic
55.00	55.01	M	6029	226	APs		CUTTINGS	GNEISS		qtz-fsp-bi-?sill

DRILLHOLE SUMMARY

Drillhole Name: YEELANNA RC 2

Map : 6029 | UnitNo :1084 | Class : SW

Completion Date :03/05/93

Dip at Collar : -90.00

Elev at Collar : 60.00

Drilling Method : RC

Max. Depth(m) : 82.00

Azimuth at Collar :

Water Cut Depth(m) :

Log Type	Log Interpreter	Log Date
LITHOLOGY LOG	L R RANKIN	03/05/93
SUMMARY STRAT. LOG	L R RANKIN	29/06/93

Litho. From	Log To		Mag. Susc (SIUnits*1000)	Major Rock Type		Minor Rock Type		Lithology Description
0.00	2.00	M	0.03	CLAY		CALCRETE		minor calcrete, khaki clay + f-m gr s/round qtz (<15%)
2.00	4.00	M	0.05	CLAY		IRONSTONE		khaki clay, abund f-gr qtz, minor Festone, minor carbonac.
4.00	6.00	M	0.06	CLAY		IRONSTONE		as above + red-orange sandy clay + grvl s/ang Festone
6.00	8.00	M	0.02	CLAY		IRONSTONE		as above
8.00	10.00	M	0.01	CLAY		SAND		cream clay, abud s/ang qtz, min. limon ferrug sand
10.00	12.00	M	0.03	CLAY		SAND		grey to red-orange sandy clay + f-gr s/ang qtz
12.00	14.00	M	0.00	CLAY		SAND		grey-cream sandy clay, f-gr s/ang qtz
14.00	16.00	M	0.00	SAND				orange-grey vf-m gr s/ang-s/rnd qtz, min. f gr fsp
16.00	18.00	M	0.05	SAND		GRAVEL		f-cs gr s/ang qtz (grey-orange), + grvl-pebble milky qtz
18.00	20.00	M	0.03	GRAVEL		SAND		s/ang milky qtz + ferricted qtz sand
20.00	22.00	M	0.59	SAND		GRAVEL		v-cs gr s/ang-s/rnd qtz sand + min. qtz grvl
22.00	24.00	M	0.06	CLAY		SAND		grey clay, min. f gr qtz, min. musc
24.00	26.00	M	0.03	CLAY				grey clay, min. f-cs gr s/ang-s/rnd qtz, min pyrite
26.00	28.00	M	0.01	CLAY		LIGNITE		as above, + min. carbonac. frags
28.00	30.00	M	0.02	CLAY		SAND		as above, + min. f-cs gr ang-s/ang qtz & Festne frags
30.00	32.00	M	0.03	CLAY		SAND		grey clay, min. f gr s/ang-s/rnd qtz, min. carbonac. frags
32.00	34.00	M	0.03	CLAY		SAND		orange,cream,grey&green sandy clay, min. m gr qtz & biot
34.00	36.00	M	0.01	CLAY				grey-green & cream clay, f-cs gr ang-s/ang qtz, min. biot
36.00	38.00	M	0.01	CLAY				cream - pale grey & green clay
38.00	40.00	M	0.01	CLAY		REGOLITH		cream-grey clay, min f gr qtz
40.00	42.00	M	0.10	CLAY		REGOLITH		grey-khaki clay, min. f-vf gr s/rnd qtz, rare ang m gr qtz
42.00	44.00	M	0.05	CLAY		REGOLITH		as above
44.00	46.00	M	0.02	CLAY		REGOLITH		as above
46.00	48.00	M	0.04	CLAY		REGOLITH		as above, grade to grey-orange clay + m gr qtz
48.00	50.00	M	0.16	CLAY		REGOLITH		as above

Litho. From	Log To		Mag. Susc (SIUnits*1000)	Major Rock Type		Minor Rock Type		Lithology Description
50.00	52.00	M	0.12	CLAY		REGOLITH		grey-green gritty clay, abund biot
52.00	54.00	M	0.30	REGOLITH		CLAY		f-m gr ang-s/ang qtz, min. green clay
54.00	56.00	M	0.02	CLAY		REGOLITH		dk green-grey clay, min. f gr qtz
56.00	58.00	M	0.08	CLAY		REGOLITH		as above + min. cream clay
58.00	60.00	M	0.17	REGOLITH		CLAY		f-m gr s/ang qtz, min clay & biot
60.00	62.00	M	0.04	REGOLITH				m-cs gr milky ang qtz + biot & ?hbl frags
62.00	64.00	M	0.02	REGOLITH		CLAY		f-m gr qtz, biot, green clay + kaolin
64.00	66.00	M	0.04	REGOLITH		CLAY		m-cs gr qtz, white fsp, f gr biot/hbl, min kaolin
66.00	68.00	M	0.08	REGOLITH		CLAY		as above
68.00	70.00	M	0.26	REGOLITH		CLAY		as above, frags chlorite
70.00	72.00	M	0.06	REGOLITH		CLAY		as above, + frags weathered g/dior gnss (m gr, well fol)
72.00	74.00	M	0.03	REGOLITH		CLAY		as above
74.00	76.00	M	0.16	REGOLITH		CLAY		as above, min frags f gr chlorite
76.00	78.00	M	0.15	REGOLITH		CLAY		as above, + frags weathered hbl-fsp (amphib-tonal gnss)
78.00	80.00	M	0.24	GNEISS				m gr white-green qtz-fsp-biot-hbl g/dior gnss, minor chlorit
80.00	82.00	M	0.05	GNEISS				as above - pink tinge to fsp, some biot rich mafic frags

Strat. From	Log To		Strat. Unit		Major Rock Type		Minor Rock Type		Lithology Description
0.00	4.00	M	TQau	?	CLAY		CALCRETE		khaki clay, minor calcrete
4.00	6.00	M	T-fe		IRONSTONE		CLAY		red-orange sandy clay + grvl-sized ironstone frags
6.00	38.00	M	Tbw		SAND		CLAY		vf-cs qtz sand & gravel, grey clay; minor lignite
38.00	82.00	M	APs		GNEISS		REGOLITH		g/dior - tonalite gneiss, 42m regolith profile

Rock From	Samples To		Map	RS No.	Strat Unit		Sample Type	Major Rock		Major Rock Modifier
34.00	56.00	M	6029	228	APs		CUTTINGS	REGOLITH		qtz sand/gravel, clay
72.00	80.00	M	6029	229	APs		CUTTINGS	CLAY		regolithic
80.00	82.00	M	6029	230	APs		CUTTINGS	GNEISS		qtz-fsp-bi gnss, chlor schist

DRILLHOLE SUMMARY

Drillhole Name: YEELANNA RC 3	Map : 6029	UnitNo :1085	Class : SW
Completion Date :25/05/93	Dip at Collar : -90.00	Elev at Collar : 55.00	Drilling Method : RC
Max. Depth(m) : 57.50	Azimuth at Collar :	Water Cut Depth(m) :	

Log Type	Log Interpreter	Log Date
LITHOLOGY LOG	L R RANKIN	25/05/93
SUMMARY STRAT. LOG	L R RANKIN	28/06/93

Litho. From	Log To		Mag. Susc (SIUnits*1000)	Major Rock Type		Minor Rock Type		Lithology Description
0.00	2.00	M	1.27	CLAY		LATERITE		minor calcrete, then brown-fawn-khaki sandy clay, Festone
2.00	4.00	M	0.28	CLAY		SAND		khaki-grey clay, min. Fe stain, ~10% v-f gr qtz
4.00	6.00	M	0.09	CLAY		LATERITE		as above, min. red Festne granules, gritty laterite
6.00	8.00	M	0.05	SAND		SILCRETE		f-m gr s/rnd silcreted sand, some Fe cement, min m-cs qtz
8.00	10.00	M	0.07	SAND		SILCRETE		white silic f gr s/rnd-rnd qtz - well cemented
10.00	12.00	M	0.02	SAND		SILCRETE		white silcreted vf-f gr qtz, grade to orange qtz sand
12.00	14.00	M	0.01	CLAY		SAND		cream sandy clay, ~30% vf-f gr qtz
14.00	16.00	M	0.02	SAND		CLAY		m-cs gr s/rnd clear-milky qtz, vf-f gr orange qtz + clay
16.00	18.00	M	0.00	SAND		CLAY		f-vcs gr ang-s/rnd qtz, min fsp, min clay. Min Fe cement
18.00	20.00	M	0.00	SAND		CLAY		as above
20.00	22.00	M	0.01	SAND		LIGNITE		f-cs gr s/ang qtz, min fsp, abund lignite
22.00	24.00	M	0.02	SAND		CLAY		f-m gr s/ang-s/rnd qtz, blk carbon. clay, pyrite framboids
24.00	26.00	M	0.01	GRAVEL		CLAY		s/ang-s/rnd grvl milky qtz, min. pyrite green-blk clay.
26.00	28.00	M	0.01	GRAVEL		CLAY		brown clay & m gr-grvl milky qtz, cs py aggregs, min lignite
28.00	30.00	M	0.02	CLAY		SAND		grey-cream clay, ~10% f-cs gr s/ang smoky qtz
30.00	32.00	M	0.00	CLAY		SAND		as above, min s/rnd milky qtz grvl, m gr py
32.00	34.00	M	0.02	SAND		CLAY		as above, ~50% m-vcs gr qtz, min py
34.00	36.00	M	0.01	CLAY		SAND		grey clay + f-cs gr s/ang-s/rnd qtz, min py, min lignite
36.00	38.00	M	0.01	CLAY		SAND		grey clay, min vf-m gr s/rnd qtz, min lignite
38.00	40.00	M	0.04	CLAY		SAND		as above, qtz vf-f gr
40.00	42.00	M	0.00	CLAY		SAND		as above, qtz f-cs gr, s/ang, milky, min py
42.00	44.00	M	0.02	CLAY		SAND		as above, qtz vf-m gr, min white fsp & f gr musc
44.00	46.00	M	0.02	CLAY		SAND		as above, min carbon. matter (downhole contamin?)
46.00	48.00	M	0.04	REGOLITH		CLAY		ang-s/ang m-cs gr milky-clear qtz, min green & cream clay
48.00	50.00	M	0.03	CLAY		REGOLITH		grey, green, orange clay, sandy - abund f gr qtz

Litho. From	Log To		Mag. Susc (SIUnits*1000)	Major Rock Type		Minor Rock Type		Lithology Description
50.00	52.00	M	0.03	CLAY		REGOLITH		grey-green clay, f-cs gr s/ang qtz+fsp, cs py aggregs, gnss
52.00	54.00	M	0.06	CLAY		GNEISS		grey-green clay, abund chlorite & biot + f-cs gr qtz-fsp gns
54.00	56.00	M	0.09	CLAY		GNEISS		as above
56.00	57.50	M	0.25	GNEISS				f gr white-green g/dior gnss, abun hbl/biot, vert foln

Strat. From	Log To		Strat. Unit		Major Rock Type		Minor Rock Type		Lithology Description
0.00	0.50	M	Q-ca		CALCRETE				calcrete
0.50	5.00	M	TQau		CLAY		SAND		khaki-grey clay
5.00	5.50	M	T-fe		LATERITE				red-blk gritty laterite
5.50	29.00	M	Tbw		CLAY		SAND		fawn-brown clay, lignite, sand, min py, mica
29.00	57.50	M	APs		GNEISS		CLAY		f gr g/dior-tonal gnss, 27.5m weathrd profile

Rock From	Samples To		Map	RS No.	Strat Unit		Sample Type	Major Rock		Major Rock Modifier
		M	6029	0						
52.00	56.00	M	6029	231	APs		CUTTINGS	REGOLITH		clay, qtz, fsp, biot
57.00	57.50	M	6029	232	APs		CUTTINGS	GNEISS		granitic, min bi+musc

DRILLHOLE SUMMARY

Drillhole Name: YEELANNA RC 4

Map : 6029

UnitNo : 1086

Class : SW

Completion Date : 26/05/93

Dip at Collar : -90.00

Elev at Collar : 50.00

Drilling Method : RC

Max. Depth(m) : 68.00

Azimuth at Collar :

Water Cut Depth(m) : 24.00

Log Type	Log Interpreter	Log Date
LITHOLOGY LOG	L RANKIN	26/05/93
SUMMARY STRAT. LOG	L RANKIN	29/06/93

Litho. From	Log To		Mag. Susc (SIUnits*1000)	Major Rock Type		Minor Rock Type		Lithology Description
0.00	2.00	M	0.31	SAND		CLAY		part silicified br-orange qtz (v.f-f gr), clayey. Min ferrct
2.00	4.00	M	0.59	CLAY		SAND		grey-green-orange clay. Min v.f gr qtz, m gr rnd Festne frag
4.00	6.00	M	0.06	CLAY		SAND		as above + abund frags red-blk Festone
6.00	8.00	M	0.12	SILCRETE		SAND		orange-white silcted s/rnd qtz f-m gr. Some ferrict frags
8.00	10.00	M	0.02	SAND		SILCRETE		white silcted f gr rnd well sorted qtz. Min silicif. kaolin
10.00	12.00	M	0.02	SAND		CLAY		as above,grades to f gr silty qtz sand, min orange clay,mica
12.00	14.00	M	0.02	SAND				f-cs gr s/ang qtz(clear,milky&orange). Rare fsp
14.00	16.00	M	0.01	SAND				as above
16.00	18.00	M	0.01	CLAY		SAND		cream to brown-blk carbonac clay; v.f-cs gr s/rnd qtz
18.00	20.00	M	0.01	CLAY		SAND		brown-blk carbonac. clay + m-cs gr s/ang-s/rnd qtz
20.00	22.00	M	0.00	SAND		SILT		m-cs gr s/ang-s/rnd qtz, min fsp. Min blk carbon. clay, silt
22.00	24.00	M	0.01	SAND		SILT		as above, + abund blk clsy/silt & wood frags
24.00	26.00	M	0.01	SAND		LIGNITE		as above, qtz s/rnd, m-cs. Large wood frags, some py replace
26.00	28.00	M	0.00	SAND		LIGNITE		as above, no pyrite
28.00	30.00	M	0.01	SAND		LIGNITE		as above, minor py, less clay & wood
30.00	32.00	M	0.01	CLAY		SILT		grey-brown silty clay, min. carbonac matter
32.00	34.00	M	0.03	CLAY		SAND		cs-v.cs gr s/ang-s/rnd qtz + grey micac clay
34.00	36.00	M	0.01	CLAY		CLAY		as above, no qtz sand, grade to cream-white clay
36.00	38.00	M	0.01	CLAY		SAND		cream kaolin, sandy (v.f-f gr qtz)
38.00	40.00	M	0.02	CLAY		SAND		as above, min cs-v.cs s/ang-s/rnd qtz
40.00	42.00	M	0.01	CLAY		SAND		cream kaolin, min v.f gr qtz
42.00	44.00	M	0.01	CLAY		SAND		as above, qtz more abund, v.f-m gr, s/ang
44.00	46.00	M	0.03	CLAY		SAND		kaolin, m-cs gr s/ang-s/rnd qtz&white fsp(30%)
46.00	48.00	M	0.02	CLAY		REGOLITH		green-grey clay, abund s/ang-ang, m-cs gr qtz & white fsp
48.00	50.00	M	0.03	CLAY		REGOLITH		as above, qtz f-m gr

Litho. From	Log To		Mag. Susc (SIUnits*1000)	Major Rock Type		Minor Rock Type		Lithology Description
50.00	52.00	M	0.04	REGOLITH		CLAY		as above, qtz predominates
52.00	54.00	M	0.03	REGOLITH		CLAY		ang-s/ang, m-cs qtz+fsp(50%), min chlorite
54.00	56.00	M	0.02	REGOLITH		CLAY		as above
56.00	58.00	M	0.05	REGOLITH		CLAY		as above, min cs gr biot
58.00	60.00	M	0.02	REGOLITH		CLAY		as above, + frags weathered biot g/dior
60.00	62.00	M	0.02	REGOLITH		CLAY		as above, some v.cs gr ang fsp
62.00	64.00	M	0.09	REGOLITH		CLAY		as above, min carbon. frags (downhole contamin)
64.00	66.00	M	0.07	REGOLITH				m gr s/ang-s/rnd qtz&fsp
66.00	68.00	M	0.03	GNEISS		REGOLITH		m gr s/ang qtz+fsp, then f-m gr greenish biotite g/dior gnss

Strat. From	Log To		Strat. Unit		Major Rock Type		Minor Rock Type		Lithology Description
0.00	5.00	M	TQau		CLAY		SAND		part silicified clayey sand, green clay
5.00	6.00	M	T-fe		LATERITE				red-blk Festone laterite
6.00	34.00	M	Tbw		SAND		CLAY		part silicified qtz sand, carbonac. clay, lignite, min py
34.00	68.00	M	APs		GNEISS		REGOLITH		well fol. biot g/dior-tonal gnss, 34m weathered profile

Rock From	Samples To		Map	RS No.	Strat Unit		Sample Type	Major Rock		Major Rock Modifier
24.00	26.00	M	6029	233	TQau		CUTTINGS	WOOD		pyrite replaced
62.00	66.00	M	6029	235	APs		CUTTINGS	REGOLITH		clay, qtz
67.00	68.00	M	6029	234	APs		CUTTINGS	GNEISS		granitic, min bi+garnet

DRILLHOLE SUMMARY

Drillhole Name: YEELANNA RC 5	Map : 6029	UnitNo :1087	Class : SW
Completion Date :26/05/93	Dip at Collar : -90.00	Elev at Collar : 50.00	Drilling Method : RC
Max. Depth(m) : 30.00	Azimuth at Collar :	Water Cut Depth(m) : 9.00	

Log Type	Log Interpreter	Log Date
LITHOLOGY LOG	L RANKIN	25/05/93
SUMMARY STRAT. LOG	L RANKIN	30/06/93

Litho. From	Log To		Mag. Susc (SIUnits*1000)	Major Rock Type		Minor Rock Type		Lithology Description
0.00	2.00	M	0.27	CLAY		SILT		30cm fawn calcareous silty soil, then orange-fawn clay
2.00	4.00	M	1.07	CLAY		IRONSTONE		orange-khaki sandy clay (v.f-f gr qtz), m gr Festne granules
4.00	6.00	M	0.08	CLAY		IRONSTONE		as above, abund Fe staining
6.00	8.00	M	0.05	SAND		SILCRETE		white f gr well sorted s/rnd qtz, silicified, Min Fe stain
8.00	10.00	M	0.07	SAND		SILCRETE		as above
10.00	12.00	M	0.01	SAND				loose f gr s/rnd-rnd qtz
12.00	14.00	M	0.02	SAND				f-m gr s/ang-s/rnd qtz
14.00	16.00	M	0.02	CLAY		SAND		blk-brown carbonac. clay, min m-cs gr s/ang-s/rnd qtz
16.00	18.00	M	0.00	CLAY		LIGNITE		as above, clay more sandy, abund wood frags
18.00	20.00	M	0.01	CLAY		LIGNITE		blk carbon. silt/clay, abund wood frags. Min m-cs gr qtz
20.00	22.00	M	0.00	CLAY		LIGNITE		blk carbon. silt/clay, abund wood, grvl-sized py aggregs
22.00	24.00	M	0.00	CLAY		SAND		as above, + m-cs gr ang-s/ang qtz sand
24.00	26.00	M	0.01	CLAY		SAND		as above - less wood, qtz m-v.cs gr
26.00	28.00	M	0.02	SAND		CLAY		f-cs gr s/ang-s/rnd qtz, rare fsp, then grey clay
28.00	30.00	M	0.02	CLAY		REGOLITH		grey-fawn clay, min v.f-m gr ang qtz. Min musc

Strat. From	Log To		Strat. Unit		Major Rock Type		Minor Rock Type		Lithology Description
0.00	0.50	M	Qp		SOIL		SILT		fawn calcareous silty soil
0.50	5.50	M	TQau		CLAY		SAND		orage-khaki sandy clay, min Festone frags
5.50	6.00	M	T-fe		LATERITE				red-black Fe stone, gritty laterite
6.00	10.00	M	T-si		SILCRETE		SAND		silcrete devel in f-gr well sorted qtz sand
10.00	28.00	M	Tbw		CLAY		LIGNITE		carbonac. clay, min qtz sand, abund wood frags

Strat. From	**Log** To		Strat. Unit		Major Rock Type		Minor Rock Type		Lithology Description
28.00	30.00	M	APs		CLAY		REGOLITH		grey-fawn clay, min qtz(ang), min musc

Rock From	**Samples** To		Map	RS No.	Strat Unit		Sample Type	Major Rock		Major Rock Modifier

DRILLHOLE SUMMARY

Drillhole Name: YEELANNA RC 6	Map : 6029	UnitNo :1088	Class : SW
Completion Date :27/05/93	Dip at Collar : -90.00	Elev at Collar : 50.00	Drilling Method : RC
Max. Depth(m) : 65.50	Azimuth at Collar :	Water Cut Depth(m) : 60.00	

Log Type	Log Interpreter	Log Date
LITHOLOGY LOG	L RANKIN	27/05/93
SUMMARY STRAT. LOG	L RANKIN	28/06/93

Litho. From	Log To		Mag. Susc (SIUnits*1000)	Major Rock Type		Minor Rock Type		Lithology Description

Strat. From	Log To		Strat. Unit		Major Rock Type		Minor Rock Type		Lithology Description
0.00	0.50	M	Q-ca		CALCRETE		SILT		sandy silt o/lying soft biscuity calcrete
0.50	2.00	M	TQau		CLAY		SAND		sandy orange-khaki clay
2.00	4.00	M	T-si		SILCRETE		SAND		grey-white silcreted f gr qtz sand, some Fe stain
4.00	30.00	M	Tbw		CLAY		SAND		grey-fawn clay + v.f- v.cs & grvl qtz (ang-s/rnd), min mica
30.00	65.50	M	APs		REGOLITH		GRANODIORITE		f-m gr biot g/dior-g/dior gnss, 34m thick weathered profile

Rock From	Samples To		Map	RS No.	Strat Unit		Sample Type	Major Rock		Major Rock Modifier
42.00	50.00	M	6029	236	APs		CUTTINGS	CLAY		regolithic
50.00	60.00	M	6029	237	APs		CUTTINGS	CLAY		regolithic
64.00	65.50	M	6029	238	APs		CUTTINGS	GRANITE		wekly deformed, min bi

DRILLHOLE SUMMARY

Drillhole Name: YEELANNA RC 7

Map : 6029 | UnitNo :1089 | Class : SW

Completion Date :27/05/93 | Dip at Collar : -90.00 | Elev at Collar : 50.00 | Drilling Method : RC

Max. Depth(m) : 51.00 | Azimuth at Collar : | Water Cut Depth(m) : 51.00

Log Type	Log Interpreter	Log Date
LITHOLOGY LOG	L RANKIN	27/05/93
SUMMARY STRAT. LOG	L RANKIN	30/06/93

Litho. From	Log To		Mag. Susc (SIUnits*1000)	Major Rock Type		Minor Rock Type		Lithology Description
0.00	2.00	M	0.06	CLAY		SAND		fawn silty soil, khaki-orange clay, silicified f gr ang qtz
2.00	4.00	M	0.03	SAND		SILCRETE		f gr s/rnd silicified white-orange qtz - grade to ferrug. qt
4.00	6.00	M	0.05	SAND		SILCRETE		f-m gr s/ang ferricted qtz, then weakly cemented sand
6.00	8.00	M	0.00	CLAY		SAND		fawn-white clay, abund cs gr ang qtz(50%)
8.00	10.00	M	0.01	CLAY		GRAVEL		grey-fawn clay, abund cs gr-grvl ang-v.ang qtz(50-60%)
10.00	12.00	M	0.00	CLAY		SAND		as above - qtz f-cs gr
12.00	14.00	M	0.00	CLAY				grey-fawn clay, min f gr qtz
14.00	16.00	M	0.00	CLAY		SAND		as above, f-m gr ang qtz, min musc
16.00	18.00	M	0.00	CLAY		SAND		as above
18.00	20.00	M	0.00	CLAY		SAND		as above, qtz f-cs gr, ang
20.00	22.00	M	0.00	CLAY		SAND		as above
22.00	24.00	M	0.00	CLAY		SAND		grey clay, abund mica + m gr to grvl, ang smoky qtz
24.00	26.00	M	0.01	CLAY		SAND		as above
26.00	28.00	M	0.05	CLAY		SAND		as above, qtz f-m gr, abund biot
28.00	30.00	M	0.06	CLAY		SAND		as above
30.00	32.00	M	0.03	CLAY		SAND		as above, qtz m gr - grvl
32.00	34.00	M	0.05	CLAY		SAND		grey-cream clay, abund f-m gr ang qtz, f gr biot
34.00	36.00	M	0.03	REGOLITH		CLAY		ang-s/ang cs - grvl qtz, py, perthite, min clay
36.00	38.00	M	0.04	REGOLITH		CLAY		m-cs gr qtz+fsp (ang-s/ang), f gr biot, cream clay, min py
38.00	40.00	M	0.07	QUARTZITE		CLAY		grey vein qtz, py veins. Cream clay, abund biot, f-m gr qtz
40.00	42.00	M	0.03	CLAY		QUARTZITE		cream-grey clay, m-gr qtz & biot, frags vein qtz
42.00	44.00	M	0.07	CLAY		GNEISS		green-grey sandy clay, frags f gr biot g/dior gnss
44.00	46.00	M	0.11	REGOLITH		GNEISS		m gr weathered q-f-bi gnss
46.00	48.00	M	0.09	REGOLITH		GNEISS		as above
48.00	50.00	M	0.03	REGOLITH		GNEISS		weathered f-m gr bi microgt

Litho. From	Log To		Mag. Susc (SIUnits*1000)	Major Rock Type		Minor Rock Type		Lithology Description
50.00	51.00	M	0.04	MICROGRANITE		PEGMATITE		cs gr qtz, perthite(?peg), <30% py veining, f gr microgt gns

Strat. From	Log To		Strat. Unit		Major Rock Type		Minor Rock Type		Lithology Description
0.00	0.50	M	Qp		SOIL		SILT		fawn calcareous silty soil
0.50	6.00	M	T-si		SILCRETE		SAND		f-m gr silicified qtz sand, partly ferricted
6.00	50.00	M	APs		REGOLITH		MICROGRANITE		f gr bi microgt, 44m weathered profile

Rock From	Samples To		Map	RS No.	Strat Unit		Sample Type	Major Rock		Major Rock Modifier
42.00	50.00	M	6029	240	APs		CUTTINGS	REGOLITH		clay, qtz, fsp grit
50.00	50.50	M	6029	239	APs		CUTTINGS	REGOLITH		clay, qtz, fsp grit
50.50	51.00	M	6029	241	APs		CUTTINGS	MICROGRANITE		weakly foliated

DRILLHOLE SUMMARY

Drillhole Name: YEELANNA RC 8	Map : 6029	UnitNo :1090	Class : SW
Completion Date :28/05/93	Dip at Collar : -90.00	Elev at Collar : 50.00	Drilling Method : RC
Max. Depth(m) : 47.50	Azimuth at Collar :	Water Cut Depth(m) : 0.20	

Log Type	Log Interpreter	Log Date
LITHOLOGY LOG	RANKIN	28/05/93
SUMMARY STRAT. LOG	RANKIN	30/06/93

Litho. From	Log To		Mag. Susc (SIUnits*1000)	Major Rock Type		Minor Rock Type		Lithology Description
0.00	2.00	M	0.06	CLAY				brown-red silty lacustr. clay, then fawn clay
2.00	4.00	M	0.05	SILCRETE		SAND		f-m gr, silicified ang-s/ang qtz
4.00	6.00	M	0.16	SILCRETE		SAND		as above, some ferricted
6.00	8.00	M	0.01	CLAY		SAND		white clay, min f gr qtz
8.00	10.00	M	0.00	CLAY		SAND		as above
10.00	12.00	M	0.02	CLAY		SAND		as above
12.00	14.00	M	0.01	CLAY				brown-grey clay, abund mica
14.00	16.00	M	0.01	CLAY				as above
16.00	18.00	M	0.08	CLAY				as above
18.00	20.00	M	0.01	CLAY				as above
20.00	22.00	M	0.03	CLAY				as above
22.00	24.00	M	0.05	CLAY				as above
24.00	26.00	M	0.04	CLAY				as above
26.00	28.00	M	0.02	CLAY				grey clay, abund biot
28.00	30.00	M	0.04	CLAY				grey clay, abund biot
30.00	32.00	M	0.04	CLAY				grey clay, abund biot
32.00	34.00	M	0.09	CLAY				grey clay, predom biot, min qtz
34.00	36.00	M	0.06	CLAY				as above
36.00	38.00	M	0.08	CLAY		REGOLITH		as above
38.00	40.00	M	0.07	CLAY		REGOLITH		as above
40.00	42.00	M	0.08	CLAY		REGOLITH		as above
44.00	46.00	M	0.07	CLAY		REGOLITH		as above + f gr qtz+fsp, frags biot ?gnss
46.00	47.50	M	0.41	GNEISS		CLAY		min clay, then biot/hbl dior? gnss, f-m gr foln~vert

Strat. From	Log To		Strat. Unit		Major Rock Type		Minor Rock Type		Lithology Description
0.00	0.50	M	Qhl		CLAY		SILT		brown-red silty clay (lacustrine)
0.50	2.00	M	TQau		CLAY				fawn-brown clay
2.00	4.00	M	T-si		SILCRETE		SAND		f-m gr silcreted qtz - s/ang, white-orange
4.00	47.50	M	APs		GNEISS		REGOLITH		f-m gr, green-blk biot/hbl diorite gneiss. 35m regol. profil

Rock From	Samples To		Map	RS No.	Strat Unit		Sample Type	Major Rock		Major Rock Modifier
40.00	46.00	M	6029	243	APs		CUTTINGS	REGOLITH		clay, qtz, lithic fragments
46.00	47.50	M	6029	244	APs		CUTTINGS	GNEISS		dioritic (biot/hbl)

DRILLHOLE SUMMARY

Drillhole Name: YEELANNA RC 9

Map : 6029

UnitNo : 1091

Class : SW

Completion Date : 29/05/93

Dip at Collar : -90.00

Elev at Collar : 50.00

Drilling Method : RC

Max. Depth(m) : 14.00

Azimuth at Collar :

Water Cut Depth(m) :

Log Type	Log Interpreter	Log Date
LITHOLOGY LOG	L RANKIN	29/05/93
SUMMARY STRAT. LOG	L RANKIN	30/06/93

Litho. From	Log To		Mag. Susc (SIUnits*1000)	Major Rock Type		Minor Rock Type		Lithology Description
0.00	2.00	M	0.03	CLAY		SAND		stiff green-orange mottled clay, min f gr qtz
2.00	4.00	M	0.04	CLAY		SILCRETE		green clay, patly silicified
4.00	6.00	M	0.04	CLAY				green-fawn clay
6.00	8.00	M	0.08	CLAY		REGOLITH		maroon clay, abund mica, some weathered cs gr fsp
8.00	10.00	M	0.08	CLAY		REGOLITH		green-grey clay, abund fsp, min f gr qtz
10.00	12.00	M	0.05	CLAY		REGOLITH		as above
12.00	14.00	M	0.08	DIORITE		GABBRO		m gr hbl gabbro/diorite gnss. Min q-f layers. Foln~45

Strat. From	Log To		Strat. Unit		Major Rock Type		Minor Rock Type		Lithology Description
0.00	2.00	M	TQau		CLAY				orange-green clay, minor f gr qtz sand
2.00	14.00	M	APs		GNEISS		REGOLITH		m gr diorite-gabbro hbl gnss, 12m weathered profile

Rock From	Samples To		Map	RS No.	Strat Unit		Sample Type	Major Rock		Major Rock Modifier
8.00	12.00	M	6029	245	APs		CUTTINGS	REGOLITH		green-grey clay
12.00	14.00	M	6029	246	APs		CUTTINGS	AMPHIBOLITE		amphibolite

DRILLHOLE SUMMARY

Drillhole Name: YEELANNA RC 12	Map : 6029	UnitNo :1092	Class : SW
Completion Date :30/05/93	Dip at Collar : -90.00	Elev at Collar : 50.00	Drilling Method : RC
Max. Depth(m) : 18.00	Azimuth at Collar :	Water Cut Depth(m) :	

Log Type	Log Interpreter	Log Date
LITHOLOGY LOG	L RANKIN	29/06/93
SUMMARY STRAT. LOG	L RANKIN	29/06/93

Litho. From	**Log** To		Mag. Susc (SIUnits*1000)	Major Rock Type		Minor Rock Type		Lithology Description
0.00	2.00	M	0.00	CLAY				sandy khaki-orange clay
2.00	4.00	M	0.02	CLAY				as above
4.00	6.00	M	0.05	CLAY		FERRICRETE		orange-grey clay, min ferrict
6.00	8.00	M	0.00	CLAY		REGOLITH		fawn-cream clay, min cs gr qtz
8.00	10.00	M	0.00	CLAY		REGOLITH		white clay, min f gr qtz + mica
10.00	12.00	M	0.00	CLAY		REGOLITH		as above
12.00	14.00	M	0.05	CLAY		GNEISS		m-cs gr ang qtz + grey clay + f gr biot-rich gneiss
14.00	16.00	M	0.01	CLAY		GNEISS		as above
16.00	18.00	M	0.05	GNEISS				well fol (S~vert) f gr biot tonalite gneiss)

Strat. From	**Log** To		Strat. Unit		Major Rock Type		Minor Rock Type		Lithology Description
0.00	5.00	M	TQau		CLAY		SAND		khaki-orange sandy clay
5.00	6.00	M	T-fe		FERRICRETE				gritty red-blk ferricrete
6.00	18.00	M	APs		GNEISS		REGOLITH		biot tonalite gneiss, 10m weathered profile

Rock From	**Samples** To		Map	RS No.	Strat Unit		Sample Type	Major Rock		Major Rock Modifier
14.00	16.00	M	6029	249	APs		CUTTINGS	REGOLITH		lithic fragments, clay
16.00	18.00	M	6029	250	APs		CUTTINGS	GNEISS		plg-biotite gneiss

DRILLHOLE SUMMARY

Drillhole Name:	YEELANNA RC 13
Map :	6029
UnitNo :	1093
Class :	SW
Completion Date :	05/06/93
Dip at Collar :	-90.00
Elev at Collar :	50.00
Drilling Method :	RC
Max. Depth(m) :	62.00
Azimuth at Collar :	
Water Cut Depth(m) :	

Log Type	Log Interpreter	Log Date
LITHOLOGY LOG	A J PARKER	05/06/93
SUMMARY STRAT. LOG	L RANKIN	29/06/93

Litho. From	Log To		Mag. Susc (SIUnits*1000)	Major Rock Type		Minor Rock Type		Lithology Description
0.00	2.00	M	0.04	CLAY		SAND		fawn-orange sandy clay / clayey sand
2.00	4.00	M	0.04	CLAY		SAND		grey-ochre sandy clay
4.00	6.00	M	0.07	CLAY		LATERITE		as above, + min lateritic Festone
6.00	8.00	M	0.30	CLAY		SAND		pale grey sandy clay
8.00	10.00	M	0.03	GRAVEL		CLAY		qtz gravel & laterite + off-white clay
10.00	12.00	M	0.04	CLAY				off-white to pale grey clay
12.00	14.00	M	0.03	CLAY				grey-brown micac. clay
14.00	16.00	M	0.02	CLAY				grey clay
16.00	18.00	M	0.03	CLAY				as above
18.00	20.00	M	0.02	CLAY				as above
20.00	22.00	M	0.02	CLAY				as above
22.00	24.00	M	0.08	CLAY		SAND		as above, occasional qtz grit
24.00	26.00	M	0.12	CLAY		SAND		as above
26.00	28.00	M	0.15	CLAY		SAND		as above
28.00	30.00	M	0.09	CLAY		SAND		as above
30.00	32.00	M	0.02	CLAY		SAND		as above, becoming more gritty
32.00	34.00	M	0.11	CLAY		SAND		as above, becoming more gritty
34.00	36.00	M	0.04	CLAY		SAND		grey fine sandy clay
36.00	38.00	M	0.02	CLAY		SAND		m gr sandy clay, qtz s/ang
38.00	40.00	M	0.03	CLAY		SAND		m gr sandy clay, qtz s/ang
40.00	42.00	M	0.04	SAND		CLAY		clayey sand, m gr but with scattered ang qtz grvl <10mm
42.00	44.00	M	0.04	REGOLITH				dk grey ?weathered basement, ang qtz & fsp sand
44.00	46.00	M	0.07	GNEISS		REGOLITH		weathered blk m gr biot-qtz gnss, v biot rich (?schist)
46.00	48.00	M	0.08	GNEISS		REGOLITH		as above
48.00	50.00	M	0.11	GNEISS		REGOLITH		as above

Litho. From	Log To		Mag. Susc (SIUnits*1000)	Major Rock Type		Minor Rock Type		Lithology Description
50.00	52.00	M	0.09	SCHIST	?	PEGMATITE	?	?biot schist + some v.cs qtz & fsp (?peg)
52.00	54.00	M	0.12	SCHIST	?	PEGMATITE	?	as above
54.00	56.00	M	0.07	SCHIST	?	PEGMATITE	?	as above
56.00	58.00	M	0.12	SCHIST	?	PEGMATITE	?	as above
58.00	60.00	M	0.07	SCHIST	?	PEGMATITE	?	as above
60.00	62.00	M	0.04	GNEISS	?	PEGMATITE	?	as above, more peg/gneissic

Strat. From	Log To		Strat. Unit		Major Rock Type		Minor Rock Type		Lithology Description
0.00	5.00	M	TQau		CLAY		SAND		fawn-orange sandy clay
5.00	5.50	M	T-fe		LATERITE				lateritic ironstone
5.50	12.00	M	Tbw		CLAY		SAND		grey sandy clay, qtz grvl & sand
12.00	62.00	M	APs		GNEISS		REGOLITH		biot-rich gneiss, minor peg. 50m weathered profile

Rock From	Samples To		Map	RS No.	Strat Unit		Sample Type	Major Rock		Major Rock Modifier
46.00	54.00	M	6029	251	APs		CUTTINGS	REGOLITH		clay + qtz grit
54.00	62.00	M	6029	252	APs		CUTTINGS	REGOLITH		clay + qtz grit
56.00	60.00	M	6029	253	APs		CUTTINGS	GNEISS		hbl-bi qtzofspathic gnss

DRILLHOLE SUMMARY

Drillhole Name: YEELANNA RC 14		Map : 6029	UnitNo :1094	Class : SW
Completion Date : 03/06/93	Dip at Collar : -90.00	Elev at Collar : 50.00		Drilling Method : RC
Max. Depth(m) : 25.50	Azimuth at Collar :	Water Cut Depth(m) :		

Log Type	Log Interpreter	Log Date
LITHOLOGY LOG	A J PARKER	03/06/93
SUMMARY STRAT. LOG	L R RANKIN	30/06/93

Litho. From	Log To		Mag. Susc (SIUnits*1000)	Major Rock Type		Minor Rock Type		Lithology Description
0.00	2.00	M	0.06	SAND				pale ochre-cream f gr sand
2.00	4.00	M	0.04	CLAY		SAND		pale grey&reddish mottled sandy clay (f gr qtz)
4.00	6.00	M	0.02	GRAVEL		SAND		grvl of ang f gr qtzte clasts, + yellow qtz sand
6.00	8.00	M	0.04	SANDSTONE		LATERITE		ochre-brown ferrug. cemented sst(f gr, well sorted), laterit
8.00	10.00	M	0.12	SAND				ochre yellow - red/brown qtz, s/rnd, well sorted
10.00	12.00	M	0.02	CLAY				off-white micac. clay, min qtz grains
12.00	14.00	M	0.02	CLAY				as above
14.00	16.00	M	0.02	CLAY				as above- clay grades to pale brown-grey
16.00	18.00	M	0.02	CLAY		SAND		as above, becoming locally sandyto gritty (ang qtz)
18.00	20.00	M	0.02	CLAY		SAND		as above
20.00	22.00	M	0.02	CLAY		REGOLITH		v sandy clay/weathered schist/gnss
22.00	24.00	M	0.04	GRAVEL		REGOLITH		m-cs gr ang qtz "sand & grvl"
24.00	25.50	M	0.03	GNEISS		REGOLITH		grey qtz grvl, then f gr biot qtz-fsp gnss

Strat. From	Log To		Strat. Unit		Major Rock Type		Minor Rock Type		Lithology Description
0.00	2.00	M	Qhs		SAND				pale ochre-cream f gr qtz sand
2.00	6.00	M	TQau		CLAY		GRAVEL		grey-red mottled sandy clay, cs qtz grvl
6.00	7.00	M	T-fe		LATERITE		SANDSTONE		ferricted qtz sand, ochre brown-red laterite
7.00	10.00	M	Tbw		SAND				yellow qtz sand m gr, s/rnd
10.00	25.50	M	APs		GNEISS		REGOLITH		f gr biot qtz-fsp gnss, 15m weathered profile

Rock From	Samples To		Map	RS No.	Strat Unit		Sample Type	Major Rock		Major Rock Modifier
24.00	25.00	M	6029	254	APs		CUTTINGS	REGOLITH		clay + qtz-fsp grit
25.00	25.50	M	6029	255	APs		CUTTINGS	GNEISS		granitic

DRILLHOLE SUMMARY

Drillhole Name: YEELANNA RC 16	Map : 6029	UnitNo :1095	Class : SW
Completion Date :03/06/93	Dip at Collar : -90.00	Elev at Collar : 45.00	Drilling Method : RC
Max. Depth(m) : 27.70	Azimuth at Collar :	Water Cut Depth(m) :	

Log Type	Log Interpreter	Log Date
LITHOLOGY LOG	A J PARKER	03/06/93
SUMMARY STRAT. LOG	L RANKIN	01/07/93

Litho. From	Log To		Mag. Susc (SIUnits*1000)	Major Rock Type		Minor Rock Type		Lithology Description
0.00	2.00	M	0.03	CLAY		CALCRETE		calcrete on mottled sandy grey/ochre clay
2.00	4.00	M	0.05	LATERITE		SANDSTONE		hard dk red-brown lateritic f gr sst
4.00	6.00	M	0.20	SAND		SILCRETE		f gr white silcreted sand
6.00	8.00	M	0.03	SAND				f-m gr qtz, sub-w/rnd
8.00	10.00	M	0.04	SAND				as above
10.00	12.00	M	0.02	SAND		LIGNITE		brown/blk lignt bands in f-m gr qtz sand, locally pyritic
12.00	14.00	M	0.02	SAND		LIGNITE		as above
14.00	16.00	M	0.02	SAND		CLAY		v-f gr brown-grey sand, silty clay
16.00	18.00	M	0.01	SAND		CLAY		as above
18.00	20.00	M	0.01	SAND		CLAY		as above
20.00	22.00	M	0.02	SAND		CLAY		v. sandy-gritty (?interbeds in silty/sandy clay), or regolit
22.00	24.00	M	0.01	REGOLITH		CLAY		m gr qtz+fsp "sand", clay + qtz
24.00	26.00	M	0.01	REGOLITH		CLAY		as above
26.00	27.70	M	0.08	GNEISS				m-f gr qtz-fsp-hbl/bi gt/gnss + ?py

Strat. From	Log To		Strat. Unit		Major Rock Type		Minor Rock Type		Lithology Description
0.00	1.00	M	Q-ca		CALCRETE				calcrete
1.00	3.00	M	TQau		CLAY		SAND		mottled grey-ochre sandy clay
3.00	4.00	M	T-fe		LATERITE		SANDSTONE		dk red-brown ferricted f gr sdst
4.00	21.00	M	Tbw		SAND		CLAY		v.f-m gr qtz, silty clay & lignite bands, min py
21.00	27.70	M	APs		GNEISS		REGOLITH		f-m gr qtz-fsp-hbl/bi gt/gnss, 6m weathered profile

Rock From	**Samples** To		Map	RS No.	Strat Unit		Sample Type	Major Rock		Major Rock Modifier
26.00	27.00	M	6029	256	APs		CUTTINGS	REGOLITH		clay, qtz, fsp grit
27.00	27.70	M	6029	257	APs		CUTTINGS	GRANITE		f-m gr q-f-bi/hbl, weakly deformed

DRILLHOLE SUMMARY

Drillhole Name: YEELANNA RC 17	Map : 6029	UnitNo :1096	Class : SW
Completion Date :04/06/93	Dip at Collar : -90.00	Elev at Collar : 45.00	Drilling Method : RC
Max. Depth(m) : 45.70	Azimuth at Collar :	Water Cut Depth(m) :	

Log Type	Log Interpreter	Log Date
LITHOLOGY LOG	A J PARKER	04/06/93
SUMMARY STRAT. LOG	L RANKIN	01/07/93

Litho. From	Log To		Mag. Susc (SIUnits*1000)	Major Rock Type		Minor Rock Type		Lithology Description
0.00	2.00	M	0.04	CLAY		CALCRETE		calcrete on mottled sandy clay (qtz f gr)
2.00	4.00	M	0.06	CLAY		SAND		mottled grey-ochre sandy clay
4.00	6.00	M	0.08	SAND		LATERITE		ochre m gr qtz, lateritic Festone/sdst
6.00	8.00	M	0.03	SAND		LIGNITE		dk green-blk-brown f-m gr lignitic qtz sand f-m gr s/a-s/rnd
8.00	10.00	M	0.02	SAND		LIGNITE		as above
10.00	12.00	M	0.02	SAND		LIGNITE		as above
12.00	14.00	M	0.02	SAND		LIGNITE		as above, qtz v.f-f gr
14.00	16.00	M	0.01	SAND		LIGNITE		as above
16.00	18.00	M	0.01	SAND		LIGNITE		as above, qtz f-m gr
18.00	20.00	M	0.02	CLAY		REGOLITH		cream-fawn sandy clay, s/ang qtz, min fsp
20.00	22.00	M	0.02	CLAY		REGOLITH		as above
22.00	24.00	M	0.03	CLAY		REGOLITH		as above
24.00	26.00	M	0.02	CLAY		REGOLITH		as above, fsp as abund as qtz
26.00	28.00	M	0.01	CLAY		REGOLITH		as above
28.00	30.00	M	0.02	CLAY		REGOLITH		as above
30.00	32.00	M	0.02	CLAY		REGOLITH		as above + frags v.cs gr peg granite
32.00	34.00	M	0.03	CLAY		REGOLITH		as above, clay decreasing
34.00	36.00	M	0.04	CLAY		REGOLITH		as above
36.00	38.00	M	0.05	GRANITE				m-cs gr granite
38.00	40.00	M	0.04	GRANITE		REGOLITH		as above, weathered/clayey + weathered amphib band
40.00	42.00	M	0.05	GRANITE				as above, min mafic, some chlorite
42.00	44.00	M	0.09	GRANITE				as above
44.00	45.70	M	0.03	GRANITE				massive m-cs gr qtz-fsp-bi-chl grey granite. Cs-v.cs gr fsp

Strat. From	**Log** To		Strat. Unit		Major Rock Type		Minor Rock Type		Lithology Description
0.00	1.00	M	Q-ca		CALCRETE				calcrete
1.00	5.00	M	TQau		CLAY		SAND		grey-ochre sandy clay
5.00	6.00	M	T-fe		LATERITE		SANDSTONE		ochre m gr sand & lateritic sdst
6.00	18.00	M	Tbw		SAND		LIGNITE		dk green-blk-brown v.f-m gr qtz sand, lignitic
18.00	45.70	M	APs		GRANITE		REGOLITH		m-cs gr grey granite, 26m weathered profile

Rock From	**Samples** To		Map	RS No.	Strat Unit		Sample Type	Major Rock		Major Rock Modifier
42.00	44.00	M	6029	258	APs		CUTTINGS	REGOLITH		weathered granite/clay
44.00	45.70	M	6029	259	APs		CUTTINGS	GNEISS		granitic

DRILLHOLE SUMMARY

Drillhole Name: YEELANNA RC 18	Map : 6029	UnitNo :1097	Class : SW
Completion Date : 06/05/93	Dip at Collar : -90.00	Elev at Collar : 45.00	Drilling Method : RC
Max. Depth(m) : 25.00	Azimuth at Collar :	Water Cut Depth(m) :	

Log Type	Log Interpreter	Log Date
LITHOLOGY LOG	A J PARKER	05/06/93
SUMMARY STRAT. LOG	L RANKIN	01/07/93

Litho. From	Log To		Mag. Susc (SIUnits*1000)	Major Rock Type		Minor Rock Type		Lithology Description
0.00	2.00	M	0.07	CLAY		SILT		claypan on mottled grey-red silty clay
2.00	4.00	M	0.04	CLAY		SILT		mottled grey-red-ochre silty clay
4.00	6.00	M	0.18	LATERITE		SANDSTONE		lateritic f gr sdts, massive v.f gr Festone
6.00	8.00	M	0.05	LATERITE		SAND		as above, then v.f gr well sorted brown-orange qtz sand
8.00	10.00	M	0.04	SAND				v.f gr brown-orange qtz sand
10.00	12.00	M	0.02	SAND		LIGNITE		f-m gr qtz sand(s/ang-s/rnd), choc brown-blk + lignite
12.00	14.00	M	0.03	SAND		LIGNITE		as above, abund lignite
14.00	16.00	M	0.02	SAND		LIGNITE		v.f-f gr qtz sand, well sorted, lignitic, locally pyritic
16.00	18.00	M	0.14	SAND		LIGNITE		as above
18.00	20.00	M	0.00	SAND		LIGNITE		as above
20.00	22.00	M	0.01	SAND		LIGNITE		as above
22.00	24.00	M	0.02	CLAY		SAND		lignitic sand, then sandy micac. clay
24.00	25.00	M	0.02	PEGMATITE				cs gr grey peg (grey fsp, min qtz), py along grain bounds

Strat. From	Log To		Strat. Unit		Major Rock Type		Minor Rock Type		Lithology Description
0.00	1.00	M	Qhl		CLAY				lacustrine clay
1.00	4.00	M	TQau		CLAY		SILT		mottled grey-red-ochre silty clay
4.00	6.00	M	T-fe		LATERITE		SANDSTONE		lateritic f gr sdst, massive Festone
6.00	23.00	M	Tbw		SAND		LIGNITE		v.f-m gr lignitic qtz sand, min py
23.00	25.00	M	APs		PEGMATITE		REGOLITH		cs gr grey pegmatite, 1m weathered profile

Rock From	Samples To		Map	RS No.	Strat Unit		Sample Type	Major Rock		Major Rock Modifier
22.00	24.00	M	6029	260	APs		CUTTINGS	REGOLITH		clay, grit
24.00	25.00	M	6029	261	APs		CUTTINGS	GNEISS		m gr grey granitic gnss

DRILLHOLE SUMMARY

Drillhole Name: YEELANNA RC 20	Map : 6029	UnitNo : 1098	Class : SW
Completion Date : 29/05/93	Dip at Collar : -90.00	Elev at Collar : 45.00	Drilling Method : RC
Max. Depth(m) : 77.00	Azimuth at Collar :	Water Cut Depth(m) : 14.00	

Log Type	Log Interpreter	Log Date
LITHOLOGY LOG	L RANKIN	29/05/93
SUMMARY STRAT. LOG	L RANKIN	01/07/93

Litho. From	Log To		Mag. Susc (SIUnits*1000)	Major Rock Type		Minor Rock Type		Lithology Description
0.00	2.00	M	0.05	CLAY		SAND		khaki-orange clay, min f gr qtz, min prt-cemented clay
2.00	4.00	M	0.03	CLAY		SAND		mottled green-orange clay, min f gr qtz, mica. Fe staining
4.00	6.00	M	0.01	SAND		CLAY		f-m gr qtz, some Fe stained, s/ang-s/rnd. Min clay
6.00	8.00	M	0.02	SAND				f gr grey qtz, s/rnd, min Fe stain
8.00	10.00	M	0.02	CLAY		LIGNITE		grey-blk silty/sandy clay, min lignite, min ferricted sand
10.00	12.00	M	0.00	SAND		CLAY		grey f gr s/rnd-rnd qtz, carbonac. matter, min clay
12.00	14.00	M	0.01	SAND		CLAY		as above
14.00	16.00	M	0.00	SAND		CLAY		as above, + abund plant matter
16.00	18.00	M	0.03	SILT		CLAY		blk carbonac. silt, clay, min f gr sand
18.00	20.00	M	0.00	SILT		CLAY		as above, min plant matter
20.00	22.00	M	0.01	SILT		CLAY		as above
22.00	24.00	M	0.02	CLAY		SAND		grey-fawn clay, min f gr ang qtz, min blk carbonac. silt
24.00	26.00	M	0.00	CLAY		SAND		fawn-brown sandy clay qtz f-cs gr, s/ang-rnd
26.00	28.00	M	0.03	CLAY		SAND		as above - qtz f-m gr
28.00	30.00	M	0.01	CLAY		SAND		as above
30.00	32.00	M	0.01	CLAY		SAND		as above, qtz f-m gr
32.00	34.00	M	0.03	CLAY		SAND		as above
34.00	36.00	M	0.05	CLAY		SAND		as above, min silicified qtz
36.00	38.00	M	0.05	CLAY		SAND		as above, abund mica
38.00	40.00	M	0.04	CLAY		SAND		as above, qtz f-cs gr, ang
40.00	42.00	M	0.02	CLAY		SAND		as above - qtz f-m gr
42.00	44.00	M	0.03	CLAY		SAND		as above - qtz f-cs gr
44.00	46.00	M	0.03	CLAY		SAND		grey-cream clay - abund m-cs gr ang qtz
46.00	48.00	M	0.05	CLAY		SAND		as above
48.00	50.00	M	0.03	CLAY		SAND		as above

Litho. From	Log To		Mag. Susc (SIUnits*1000)	Major Rock Type		Minor Rock Type		Lithology Description
50.00	52.00	M	0.02	CLAY		SAND		as above
52.00	54.00	M	0.04	CLAY		SAND		as above
54.00	56.00	M	0.02	CLAY		SAND		as above
56.00	58.00	M	0.03	CLAY		REGOLITH		grey clay, abund m-cs gr ang qtz
58.00	60.00	M	0.06	REGOLITH		CLAY		abund m-cs gr ang qtz, grey clay
60.00	62.00	M	0.07	REGOLITH		CLAY		as above
62.00	64.00	M	0.01	REGOLITH		CLAY		m-cs gr and-s/ang qtz&fsp (70:30%), min biot & grey clay
64.00	66.00	M	0.04	REGOLITH		CLAY		as above
66.00	68.00	M	0.04	REGOLITH		CLAY		as above - clay more abund
68.00	70.00	M	0.03	REGOLITH		CLAY		as above - less clay
70.00	72.00	M	0.05	REGOLITH		CLAY		as above
72.00	74.00	M	0.07	REGOLITH		CLAY		as above
74.00	76.00	M	0.04	REGOLITH		CLAY		as above
76.00	77.00	M	0.02	GNEISS				m-cs gr pink-grey biot granite gnss. Foln mod angle

Strat. From	Log To		Strat. Unit		Major Rock Type		Minor Rock Type		Lithology Description
0.00	4.00	M	TQau		CLAY				mottled green-khaki-orange clay, min mica& qtz, min Fe stain
4.00	36.00	M	Tbw		SAND		CLAY		f-m gr sand, sandy & lignitic clay, abund plant matter
36.00	77.00	M	APs		GNEISS		REGOLITH		m-cs gr biot gt/gnss, 40m weathered profile

Rock From	Samples To		Map	RS No.	Strat Unit		Sample Type	Major Rock		Major Rock Modifier
72.00	76.00	M	6029	247	APs		CUTTINGS	REGOLITH		fawn-brown sandy clay
76.00	77.00	M	6029	248	APs		CUTTINGS	GNEISS		granitic

DRILLHOLE SUMMARY

Drillhole Name: YEELANNA RC 22	Map : 6029	UnitNo :1099	Class : SW
Completion Date :06/06/93	Dip at Collar : -90.00	Elev at Collar : 45.00	Drilling Method : RC
Max. Depth(m) : 39.70	Azimuth at Collar :	Water Cut Depth(m) :	

Log Type	Log Interpreter	Log Date
LITHOLOGY LOG	A J PARKER	06/06/93
SUMMARY STRAT. LOG	L RANKIN	01/07/93

Litho. From	Log To		Mag. Susc (SIUnits*1000)	Major Rock Type		Minor Rock Type		Lithology Description
0.00	2.00	M	0.03	SAND		CLAY		off white seif dune qtz sand on mottled yellow sandy clay
2.00	4.00	M	0.03	CLAY		SAND		mottled grey-red silty/sandy clay
4.00	6.00	M	0.04	LATERITE		SANDSTONE		laterite on f gr white sdst
6.00	8.00	M	0.08	SAND		LATERITE		lateritic grit & off white to ochre f gr sand
8.00	10.00	M	0.04	SAND		LIGNITE		f gr lignitic qtz sand, well sorted, brown-fawn
10.00	12.00	M	0.05	SAND		LIGNITE		as above
12.00	14.00	M	0.05	SAND		LIGNITE		as above
14.00	16.00	M	0.04	SAND		LIGNITE		as above-local large(cm) f gr py aggregs
16.00	18.00	M	0.05	SAND		LIGNITE		as above- more lignite, dk brown-blk qtz sand
18.00	20.00	M	0.04	SAND		LIGNITE		as above
20.00	22.00	M	0.02	SAND		LIGNITE		paler coloured f gr lignitic sand, + py
22.00	24.00	M	0.02	SAND		LIGNITE		as above
24.00	26.00	M	0.02	CLAY		REGOLITH		m gr ang qtz in cream brown clay
26.00	28.00	M	0.01	CLAY		REGOLITH		as above
28.00	30.00	M	0.03	CLAY		REGOLITH		as above
30.00	32.00	M	0.05	CLAY		REGOLITH		as above
32.00	34.00	M	0.02	CLAY		REGOLITH		as above
34.00	36.00	M	0.05	CLAY		REGOLITH		as above
36.00	38.00	M	0.08	CLAY		REGOLITH		as above, then fresher q-f-bi peg gt
38.00	39.70	M	0.08	GRANITE				cs gr qtz-fsp-bi grey peg granite

Strat. From	Log To		Strat. Unit		Major Rock Type		Minor Rock Type		Lithology Description
0.00	1.00	M	Qhs		SAND				off white qtz seif dune sand
1.00	5.00	M	TQau		CLAY		SAND		mottled yellow-grey-red silty/sandy clay
5.00	8.00	M	T-fe		LATERITE		SAND		latreite devel on f gr white-ochre qtz sand
8.00	25.00	M	Tbw		SAND		LIGNITE		v.f-m gr lignitic qtz sand, min clay, silt
25.00	39.70	M	APs		GRANITE		REGOLITH		cs gr qtz-fsp-bi peg granite, 13m weathered profile

Rock From	Samples To		Map	RS No.	Strat Unit		Sample Type	Major Rock		Major Rock Modifier
32.00	39.70	M	6029	262	APs		CUTTINGS	REGOLITH		creamy-brown clay
38.00	39.70	M	6029	263	APs		CUTTINGS	GRANITE		q-f-bi pegmatitic

DRILLHOLE SUMMARY

Drillhole Name: YEELANNA RC 24

Map : 6029 | UnitNo :1100 | Class : SW

Completion Date :07/06/93 | Dip at Collar : -90.00 | Elev at Collar : 45.00 | Drilling Method : RC

Max. Depth(m) : 71.50 | Azimuth at Collar : | Water Cut Depth(m) :

Log Type	Log Interpreter	Log Date
LITHOLOGY LOG	A J PARKER	07/06/93
SUMMARY STRAT. LOG	L R RANKIN	01/07/93

Litho. From	Log To		Mag. Susc (SIUnits*1000)	Major Rock Type		Minor Rock Type		Lithology Description
0.00	2.00	M	0.04	CLAY		CALCRETE		calcrete on calcareous mottled grey-red sandy clay
2.00	4.00	M	0.03	CLAY		SAND		calcareous mottled clay, grey-red
4.00	6.00	M	0.05	CLAY		LATERITE		as above, then ferricted f gr sdst
6.00	8.00	M	0.02	LATERITE		SANDSTONE		ferricted f gr sdst (red-ochre)
8.00	10.00	M	0.01	SAND				off white f-v.f gr qtz sand
10.00	12.00	M	0.03	SAND		LIGNITE		as above, min m gr qtz, then m gr lignitic qtz sand
12.00	14.00	M	0.01	SAND		LIGNITE		interbed lignitic & qtz sands, some good lignite
14.00	16.00	M	0.00	SAND		LIGNITE		as above
16.00	18.00	M	0.02	SAND		LIGNITE		as above
18.00	20.00	M	0.00	SAND		LIGNITE		f-m gr qtz, some cs gr. Good lignite + py nodules
20.00	22.00	M	0.01	SAND		LIGNITE		as above, large py nodule& good lignite at 21.5m
22.00	24.00	M	0.04	SAND				m-cs gr pyritic qtz sand, local grit
24.00	26.00	M	0.00	SAND				as above
26.00	28.00	M	0.01	CLAY		REGOLITH		pale fawn-khaki gritty clay, ang qtz,mica,relic m gr texture
28.00	30.00	M	0.01	CLAY		REGOLITH		as above
30.00	32.00	M	0.02	CLAY		REGOLITH		as above
32.00	34.00	M	0.01	CLAY		REGOLITH		as above
34.00	36.00	M	0.03	CLAY		REGOLITH		as above
36.00	38.00	M	0.00	CLAY		REGOLITH		as above
38.00	40.00	M	0.00	CLAY		REGOLITH		as above
40.00	42.00	M	0.01	CLAY		REGOLITH		as above
42.00	44.00	M	0.00	CLAY		REGOLITH		as above
44.00	46.00	M	0.01	CLAY		REGOLITH		as above
46.00	48.00	M	0.03	CLAY		REGOLITH		as above
48.00	50.00	M	0.01	CLAY		REGOLITH		as above

Litho. From	Log To		Mag. Susc (SIUnits*1000)	Major Rock Type		Minor Rock Type		Lithology Description
50.00	52.00	M	0.03	CLAY		REGOLITH		as above
52.00	54.00	M	0.03	CLAY		REGOLITH		as above, becoming slightly greyer, fresher
54.00	56.00	M	0.01	CLAY		REGOLITH		as above
56.00	58.00	M	0.02	CLAY		REGOLITH		as above
58.00	60.00	M	0.02	CLAY		REGOLITH		as above
60.00	62.00	M	0.01	CLAY		REGOLITH		as above
62.00	64.00	M	0.00	CLAY		REGOLITH		as above
64.00	66.00	M	0.03	CLAY		REGOLITH		as above
66.00	68.00	M	0.00	CLAY		REGOLITH		as above
68.00	70.00	M	0.05	CLAY		REGOLITH		as above
70.00	71.50	M	0.05	CLAY		REGOLITH		weathered m gr qtz-fsp-bi granite, clay

Strat. From	Log To		Strat. Unit		Major Rock Type		Minor Rock Type		Lithology Description
0.00	1.00	M	Q-ca		CALCRETE				calcrete
1.00	5.00	M	TQau		CLAY				mottled sandy calcareous grey-ochre clay
5.00	8.00	M	T-fe		LATERITE		SANDSTONE		ferricted f gr red-ochre sdst
8.00	25.00	M	Tbw		SAND		LIGNITE		lignitic, pyritic f-cs gr qtz sand
25.00	71.50	M	APs		REGOLITH		CLAY		fawn-grey gritty clay (regolith), min weathered granite

Rock From	Samples To		Map	RS No.	Strat Unit		Sample Type	Major Rock		Major Rock Modifier
32.00	42.00	M	6029	290	APs		CUTTINGS	REGOLITH		fawn-khaki clay
42.00	52.00	M	6029	291	APs		CUTTINGS	REGOLITH		fawn-khaki clay
44.00	46.00	M	6029	294	APs		CUTTINGS	REGOLITH		fawn-khaki clay
52.00	62.00	M	6029	292	APs		CUTTINGS	REGOLITH		fawn-khaki clay
62.00	72.00	M	6029	293	APs		CUTTINGS	REGOLITH		fawn-khaki clay
66.00	68.00	M	6029	295	APs		CUTTINGS	GRANITE		highly weathered

DRILLHOLE SUMMARY

Drillhole Name: YEELANNA RC 26	Map : 6029	UnitNo :1101	Class : SW
Completion Date : 06/06/93	Dip at Collar : -90.00	Elev at Collar : 50.00	Drilling Method : RC
Max. Depth(m) : 25.00	Azimuth at Collar :	Water Cut Depth(m) : 24.00	

Log Type	Log Interpreter	Log Date
LITHOLOGY LOG	A J PARKER	06/06/93
SUMMARY STRAT. LOG	L RANKIN	01/07/93

Litho. From	Log To		Mag. Susc (SIUnits*1000)	Major Rock Type		Minor Rock Type		Lithology Description
0.00	2.00	M	0.05	CLAY		CALCRETE		calcrete on mottled ochre red f gr sand & sandy clay
2.00	4.00	M	0.03	SILCRETE		SANDSTONE		yellow-white silcreted f gr sdst
4.00	6.00	M	0.02	SAND				v.f-f gr qtz sand, off white
6.00	8.00	M	0.03	SANDSTONE				ochre yellow cemented f gr well sorted sdst, rnd qtz
8.00	10.00	M	0.03	SANDSTONE				as above
10.00	12.00	M	0.03	SAND		LIGNITE		v.f gr lignitic sand, dk choc brown
12.00	14.00	M	0.01	SAND		LIGNITE		as above, + alternating cream v.f gr qtz sand
14.00	16.00	M	0.00	SAND		LIGNITE		as above
16.00	18.00	M	0.01	SAND		LIGNITE		as above, coarsening to m gr sand + lignite beds
18.00	20.00	M	0.01	SAND		LIGNITE		f gr lignitic sand
20.00	22.00	M	0.02	SAND		CLAY		m-cs gr sand, fawn gritty clay, silvery faint bands
22.00	24.00	M	0.01	SAND		CLAY		as above
24.00	25.00	M	0.01	GNEISS				m gr qtz-fsp gneiss, min py

Strat. From	Log To		Strat. Unit		Major Rock Type		Minor Rock Type		Lithology Description
0.00	1.00	M	Q-ca		CALCRETE				calcrete
1.00	2.00	M	TQau		CLAY		SAND		mottled ochre-red clay, sand
2.00	10.00	M	T-si		SILCRETE		SANDSTONE		silcreted f gr well sorted rnd qtz sdst
10.00	21.00	M	Tbw		SAND		LIGNITE		v.f-cs gr lignitic sand, lignite beds
21.00	25.00	M	APs		GNEISS				m gr qtz-fsp gnss, min pyrite

Rock From	Samples To		Map	RS No.	Strat Unit		Sample Type	Major Rock		Major Rock Modifier
22.00	25.00	M	6029	264	PPh	?	CUTTINGS	REGOLITH		fawn sandy gritty clay
24.00	25.00	M	6029	265	PPh	?	CUTTINGS	GNEISS		granitic, deformed, minor pyrite

DRILLHOLE SUMMARY

Drillhole Name: YEELANNA RC 28	Map : 6029	UnitNo :1102	Class : SW
Completion Date :06/07/93	Dip at Collar : -90.00	Elev at Collar : 55.00	Drilling Method : RC
Max. Depth(m) : 65.50	Azimuth at Collar :	Water Cut Depth(m) : 20.00	

Log Type	Log Interpreter	Log Date
LITHOLOGY LOG	A J PARKER	07/06/93
SUMMARY STRAT. LOG	L RANKIN	01/07/93

Litho. From	Log To		Mag. Susc (SIUnits*1000)	Major Rock Type		Minor Rock Type		Lithology Description
0.00	2.00	M	0.07	CLAY		CALCRETE		calcrete on mottled sandy clay
2.00	4.00	M	0.05	CLAY				mottled sandy clay
4.00	6.00	M	0.08	CLAY		FERRICRETE		as above, then ferricted sand
6.00	8.00	M	0.03	FERRICRETE		SILCRETE		ochre yellow ferricted f gr sand, white silcted f-m gr sand
8.00	10.00	M	0.04	SAND				v.f-f gr orange qtz sand
10.00	12.00	M	0.06	SAND				as above, + min yellow-white qtz sand
12.00	14.00	M	0.05	SAND				as above
14.00	16.00	M	0.05	SAND				as above
16.00	18.00	M	0.04	SAND		GRAVEL		as above, local grit&grvl
18.00	20.00	M	0.06	SAND				v.f gr well sorted off white qtz sand
20.00	22.00	M	0.02	SAND				v.f-f gr lignitic sand
22.00	24.00	M	0.03	SAND		LIGNITE		as above, promin. py band in lign sand @ 23m
24.00	26.00	M	0.03	SAND		LIGNITE		v.f-f gr lignitic sand
26.00	28.00	M	0.02	SAND		LIGNITE		as above
28.00	30.00	M	0.03	SAND		LIGNITE		as above
30.00	32.00	M	0.02	SAND		LIGNITE		as above
32.00	34.00	M	0.02	SAND		LIGNITE		f-m gr lignitic qtz sand, some wood
34.00	36.00	M	0.02	SAND		LIGNITE		as above
36.00	38.00	M	0.02	CLAY		REGOLITH		pale fawn-khaki qtz-mica clay
38.00	40.00	M	0.03	CLAY				as above
40.00	42.00	M	0.03	CLAY				as above
42.00	44.00	M	0.02	CLAY				as above, becoming fresher (?q-f-bi gnss)
44.00	46.00	M	0.03	CLAY				as above
46.00	48.00	M	0.03	CLAY				kaolinised q-f-bi gnss
48.00	50.00	M	0.07	CLAY				as above

Litho. From	Log To		Mag. Susc (SIUnits*1000)	Major Rock Type		Minor Rock Type		Lithology Description
50.00	52.00	M	0.07	CLAY				as above
52.00	54.00	M	0.27	CLAY				as above
54.00	56.00	M	0.09	CLAY				as above
56.00	58.00	M	0.04	CLAY				as above
58.00	60.00	M	0.08	CLAY				as above
60.00	62.00	M	0.05	CLAY				as above
62.00	64.00	M	0.05	CLAY				as above
64.00	65.50	M	0.06	CLAY				grey kaolinised gneiss

Strat. From	Log To		Strat. Unit		Major Rock Type		Minor Rock Type		Lithology Description
0.00	0.50	M	Q-ca		CALCRETE				calcrete
0.50	5.00	M	TQau		CLAY		SAND		mottled sandy clay
5.00	6.00	M	T-fe		LATERITE		SANDSTONE		yellow ferricted f gr sand
6.00	8.00	M	T-si		SILCRETE		SANDSTONE		white silcreted qtz sand
8.00	36.00	M	Tbw		SAND		LIGNITE		v.f-cs qtz lignitic qtz sand, min grvl, min pyrite
36.00	65.50	M	APs		REGOLITH		CLAY		kaolinised q-f-bi gnss, fawn-grey clay

Rock From	Samples To		Map	RS No.	Strat Unit		Sample Type	Major Rock		Major Rock Modifier
		M	6029							
36.00	46.00	M	6029	286	APs		CUTTINGS	REGOLITH		fawn-khaki clay
46.00	47.00	M	6029	287	APs		CUTTINGS	REGOLITH		kaolinite
46.00	56.00	M	6029	288	APs		CUTTINGS	REGOLITH		kaolinite
56.00	65.50	M	6029	289	APs		CUTTINGS	REGOLITH		kaolinised ?gneiss

DRILLHOLE SUMMARY

Drillhole Name: YEELANNA RC 29

Map : 6029 | UnitNo :1103 | Class : SW

Completion Date :08/06/93 | Dip at Collar : -90.00 | Elev at Collar : 55.00 | Drilling Method : RC

Max. Depth(m) : 74.00 | Azimuth at Collar : | Water Cut Depth(m) :

Log Type	Log Interpreter	Log Date
LITHOLOGY LOG	A J PARKER	07/06/93
SUMMARY STRAT. LOG	L RANKIN	01/07/93

Litho. From	Log To		Mag. Susc (SIUnits*1000)	Major Rock Type		Minor Rock Type		Lithology Description
		M						
0.00	2.00	M	0.05	SAND		CALCRETE		calcrete on mottled clayey sand & clay
2.00	4.00	M	0.05	SILCRETE		SANDSTONE		white silcted f gr sdst
4.00	6.00	M	0.04	SILCRETE		SAND		as above, then v.f gr pinkish sand/silt
6.00	8.00	M	0.03	SILCRETE		SANDSTONE		white silcted sdst, then mottled red-pink m-f gr sdst
8.00	10.00	M	0.02	SAND		SILT		white v.f gr well sorted qtz, local pink v.f gr sand/silt
10.00	12.00	M	0.03	SAND		SILT		as above
12.00	14.00	M	0.07	SAND		SILT		as above
14.00	16.00	M	0.22	SAND		SILT		as above, local yellow v.f-f gr qtz sand (trace m gr qtz)
16.00	18.00	M	0.04	SAND		SILT		as above
18.00	20.00	M	0.04	SAND		LIGNITE		m gr qtz, grey-brown, min lignite
20.00	22.00	M	0.02	SAND		SILT		interbanded m-f gr sand, local grit
22.00	24.00	M	0.00	SAND		LIGNITE		choc brown-blk lignitic sand (v.f gr), pyritic lignite
24.00	26.00	M	0.01	SAND		LIGNITE		as above
26.00	28.00	M	0.01	SAND		LIGNITE		f-m gr rnd-s/rnd qtz, min lignite, small py nodules (1-2mm)
28.00	30.00	M	0.02	SAND		LIGNITE		as above
30.00	32.00	M	0.01	SAND		LIGNITE		as above
32.00	34.00	M	0.01	SAND		LIGNITE		f-cs gr qtz, locally lignitic, min grit
34.00	36.00	M	0.02	SAND		LIGNITE		as above, + good pyritic lignite
36.00	38.00	M	0.02	SAND		LIGNITE		as above, less lignite, py nodules <3cm
38.00	40.00	M	0.02	SAND		LIGNITE		m-cs gr lignitic sands + abund py nodules, v.f silt/mud
40.00	42.00	M	0.02	SAND		LIGNITE		as above
42.00	44.00	M	0.02	SAND		LIGNITE		as above, lignite less abundant
44.00	46.00	M	0.01	SAND		SHALE		m-cs gr qtz sand, v.f gr shaley beds (pyritic)
46.00	48.00	M	0.02	CLAY		REGOLITH		pale fawn gritty clay, ang qtz

Litho. From	Log To		Mag. Susc (SIUnits*1000)	Major Rock Type		Minor Rock Type		Lithology Description
48.00	50.00	M	0.01	CLAY		REGOLITH		as above
50.00	52.00	M	0.01	CLAY		REGOLITH		grey micac. clay + m gr qtz
52.00	54.00	M	0.03	CLAY		REGOLITH		as above
54.00	56.00	M	0.03	CLAY		REGOLITH		as above
56.00	58.00	M	0.05	CLAY		REGOLITH		as above
58.00	60.00	M	0.03	CLAY		REGOLITH		thick bands grey v.cs gr vein qtz, clay
60.00	62.00	M	0.04	CLAY		REGOLITH		clay - bi-qtz ?schist, m gr biot-rich
62.00	64.00	M	0.05	CLAY		REGOLITH		as above
64.00	66.00	M	0.04	CLAY		REGOLITH		as above
66.00	68.00	M	0.03	CLAY		REGOLITH		as above
68.00	70.00	M	0.05	GRANITE		REGOLITH		weathered/kaolinised q-f-bi granite (gneissic?)
70.00	72.00	M	0.03	GRANITE		REGOLITH		as above
72.00	74.00	M	0.04	GRANITE				m gr massive q-f-bi granite

Strat. From	Log To		Strat. Unit		Major Rock Type		Minor Rock Type		Lithology Description
0.00	1.00	M	Q-ca		CALCRETE				calcrete
1.00	3.00	M	TQau		SAND		CLAY		mottled red-ochre-grey clayey sand, clay
3.00	5.00	M	T-si		SILCRETE		SANDSTONE		white, silcreted f gr sdst
5.00	6.00	M	Tbw		SAND		SILT		v.f gr pink sand/silt
6.00	7.00	M	T-si		SILCRETE		SANDSTONE		white silcreted sdst
7.00	47.00	M	TQau		SAND		LIGNITE		v.f-cs gr qtz sand, lignite, pyritic
47.00	74.00	M	APs		GRANITE		REGOLITH		m gr q-f-bi granite, 25m weathered profile

Rock From	Samples To		Map	RS No.	Strat Unit		Sample Type	Major Rock		Major Rock Modifier
54.00	64.00	M	6029	266	APs		CUTTINGS	REGOLITH		micaceous clay
64.00	74.00	M	6029	267	APs		CUTTINGS	GNEISS		kaolinised
72.00	74.00	M	6029	268	APs		CUTTINGS	GNEISS		m gr q-f-bi, sheared

DRILLHOLE SUMMARY

Drillhole Name:	YEELANNA RC 31
Map :	6029
UnitNo :	1104
Class :	SW
Completion Date :	08/06/93
Dip at Collar :	-90.00
Elev at Collar :	50.00
Drilling Method :	RC
Max. Depth(m) :	59.50
Azimuth at Collar :	
Water Cut Depth(m) :	22.00

Log Type	Log Interpreter	Log Date
LITHOLOGY LOG	A J PARKER	08/06/93
SUMMARY STRAT. LOG	L RANKIN	01/07/93

Litho. From	Log To		Mag. Susc (SIUnits*1000)	Major Rock Type		Minor Rock Type		Lithology Description
0.00	2.00	M	0.05	CALCRETE				calcrete
2.00	4.00	M	0.09	CLAY		SILCRETE		mottled ochre/red/grey sandy clay, then white silcted sand
4.00	6.00	M	0.09	SAND		SILCRETE		mottled f gr clayey sand, bands silcted qtz, ferricted grit
6.00	8.00	M	0.04	SAND		SILCRETE		as above
8.00	10.00	M	0.02	SAND				f-m gr well sorted qtz, rnd. Yellow-cream
10.00	12.00	M	0.02	SAND				as above
12.00	14.00	M	0.01	SAND				as above, + beds m-cs gr qtz
14.00	16.00	M	0.03	SAND				as above, then f gr orange sand
16.00	18.00	M	0.04	SAND		SANDSTONE		f gr orange sand, then red/brown Ferricted sdst
18.00	20.00	M	0.02	SANDSTONE		SAND		red/brown ferricted sdst, then v.f gr brown-white qtz sand
20.00	22.00	M	0.02	SAND		SILT		v.f gr brown-white qtz, + v.f gr blk lignitic sand/silt
22.00	24.00	M	0.01	SAND		SILT		lignitic f gr sand/silt
24.00	26.00	M	0.01	SAND		CLAY		as above, then micac silty clay
26.00	28.00	M	0.01	CLAY				grey/brown/fawn/khaki micac silty clay
28.00	30.00	M	0.01	CLAY				as above
30.00	32.00	M	0.02	CLAY		REGOLITH		as above, + cs gr ang qtz + ?py nodules
32.00	34.00	M	0.01	CLAY		REGOLITH		as above
34.00	36.00	M	0.01	CLAY		REGOLITH		as above
36.00	38.00	M	0.01	CLAY		REGOLITH		as above
38.00	40.00	M	0.03	CLAY		REGOLITH		as above
40.00	42.00	M	0.06	CLAY		REGOLITH		as above, become grey, more micac.
42.00	44.00	M	0.03	CLAY		REGOLITH		grey micac(+biot) clay/?schist +m gr qtz
44.00	46.00	M	0.05	CLAY		REGOLITH		as above
46.00	48.00	M	0.05	CLAY		REGOLITH		as above
48.00	50.00	M	0.05	REGOLITH		REGOLITH		f gr bi/chlor schist (?clay) - v. soft, + m gr qtz

Litho. From	Log To		Mag. Susc (SIUnits*1000)	Major Rock Type		Minor Rock Type		Lithology Description
50.00	52.00	M	0.04	REGOLITH		REGOLITH		as above
52.00	54.00	M	0.11	REGOLITH		REGOLITH		as above, + cs gr qtz veins
54.00	56.00	M	0.09	REGOLITH		REGOLITH		as above
56.00	58.00	M	0.14	REGOLITH		GNEISS		clay + min m gr qtz-fsp-bi-ga gnss
58.00	59.50	M	0.27	REGOLITH		GNEISS		as above

Strat. From	Log To		Strat. Unit		Major Rock Type		Minor Rock Type		Lithology Description
0.00	2.00	M	Q-ca		CALCRETE				calcrete
2.00	3.50	M	TQau		CLAY		SAND		mottled sandy clay
3.50	8.00	M	T-si		SILCRETE		SAND		white silcreted f gr sand,, mottled clayey sand, min ferrict
8.00	25.00	M	Tbw		SAND		SILT		v.f-cs gr qtz sand, silt, lignite, mi clay
25.00	59.50	M	APs		REGOLITH		REGOLITH		clay+ q-f-bi-ga gnss, 34.5m weathered profile

Rock From	Samples To		Map	RS No.	Strat Unit		Sample Type	Major Rock		Major Rock Modifier
40.00	50.00	M	6029	270	APs	?	CUTTINGS	REGOLITH		?weathered schist
50.00	59.50	M	6029	271	APs	?	CUTTINGS	REGOLITH	?	schist?, local qtz veins
56.00	57.00	M	6029	269	APs	?	CUTTINGS	REGOLITH	?	f gr, min q-f-bi gneiss, weathered
58.00	59.50	M	6029	272	APs	?	CUTTINGS	REGOLITH	?	f gr, min q-f-bi gneiss, weathered

DRILLHOLE SUMMARY

Drillhole Name: YEELANNA RC 32		Map : 6029	UnitNo :1105	Class : SW
Completion Date :09/06/93	Dip at Collar : -90.00	Elev at Collar : 50.00		Drilling Method : RC
Max. Depth(m) : 55.00	Azimuth at Collar :	Water Cut Depth(m) :		

Log Type	Log Interpreter	Log Date
LITHOLOGY LOG	A J PARKER	08/06/93
SUMMARY STRAT. LOG	L RANKIN	02/07/93

Litho. From	Log To		Mag. Susc (SIUnits*1000)	Major Rock Type		Minor Rock Type		Lithology Description
0.00	2.00	M	0.10	CALCRETE		SAND		calcrete bands in mottled calc. clayey f gr sand
2.00	4.00	M	0.06	SAND		SILCRETE		mottled calc. clayey sand, then silcted f gr qtz sdst
4.00	6.00	M	0.03	SAND				v.f-f gr white-yellow qtz sand
6.00	8.00	M	0.02	SAND				as above
8.00	10.00	M	0.02	SAND				as above
10.00	12.00	M	0.02	SAND				as above + min m gr qtz sand
12.00	14.00	M	0.03	SAND				as above
14.00	16.00	M	0.02	SAND		FERRICRETE		dk red m gr ferricted sand, local grit bands
16.00	18.00	M	0.02	SAND		FERRICRETE		as above
18.00	20.00	M	0.02	SAND		LIGNITE		v.f-f gr lignitic qtz sand, min cs gr-gritty sand
20.00	22.00	M	0.02	SAND		LIGNITE		as above
22.00	24.00	M	0.02	SAND		GRAVEL		f gr lignitic sand, min grvl, py nodules (qtz/qtzte)
24.00	26.00	M	0.00	SAND		GRAVEL		as above
26.00	28.00	M	0.00	CLAY		REGOLITH		fawn-grey clay, min cs gr ang qtz, white clay(after fsp)
28.00	30.00	M	0.02	CLAY		REGOLITH		as above, saprol.texture
30.00	32.00	M	0.02	CLAY		REGOLITH		as above
32.00	34.00	M	0.02	CLAY		REGOLITH		as above
34.00	36.00	M	0.01	CLAY		REGOLITH		as above
36.00	38.00	M	0.02	CLAY		REGOLITH		as above, fresher, saprol gnssic texture
38.00	40.00	M	0.04	CLAY		REGOLITH		as above
40.00	42.00	M	0.04	CLAY		REGOLITH		as above, schistose + crenulations (bi/chlor)
42.00	44.00	M	0.07	CLAY		REGOLITH		as above
44.00	46.00	M	0.06	REGOLITH		SCHIST		m gr bi/chl schist, saprol.
46.00	48.00	M	0.07	REGOLITH		SCHIST		as above
48.00	50.00	M	0.07	REGOLITH		SCHIST		as above

Litho. From	Log To		Mag. Susc (SIUnits*1000)	Major Rock Type		Minor Rock Type		Lithology Description
50.00	52.00	M	0.07	REGOLITH		SCHIST		as above
52.00	54.00	M	0.04	REGOLITH		GNEISS		as above, some pink gnss frags
54.00	55.00	M	0.05	GNEISS				pink q-f-bi granite gneiss, mica rich

Strat. From	Log To		Strat. Unit		Major Rock Type		Minor Rock Type		Lithology Description
0.00	4.00	M	TQau		SAND		CALCRETE		calc clayey sand, calcrete bands
4.00	5.00	M	T-si		SILCRETE		SANDSTONE		silcted f gr well sorted qtz sdst
5.00	26.00	M	Tbw		SAND		LIGNITE		v.f-m gr lignitic qtz sand, min cs, grit bands,silt, min py
26.00	55.00	M	APs		GNEISS		REGOLITH		q-f-bi granite gnss, ?min schist, 28 m weathered profile

Rock From	Samples To		Map	RS No.	Strat Unit		Sample Type	Major Rock		Major Rock Modifier
28.00	38.00	M	6029	273	APs		CUTTINGS	REGOLITH		grey clay
38.00	48.00	M	6029	274	APs		CUTTINGS	REGOLITH	?	m gr bi/chl
48.00	55.00	M	6029	275	APs		CUTTINGS	REGOLITH	?	m gr bi/chl
54.00	55.00	M	6029	276	APs		CUTTINGS	GNEISS		pink q-f-bi/chl granitic

DRILLHOLE SUMMARY

Drillhole Name: YEELANNA RC 33		Map : 6029	UnitNo : 1106	Class : SW
Completion Date : 08/06/93	Dip at Collar : -90.00	Elev at Collar : 50.00		Drilling Method : RC
Max. Depth(m) : 28.70	Azimuth at Collar :	Water Cut Depth(m) :		

Log Type	Log Interpreter	Log Date
LITHOLOGY LOG	A J PARKER	08/06/93
SUMMARY STRAT. LOG	L RANKIN	02/07/93

Litho. From	Log To		Mag. Susc (SIUnits*1000)	Major Rock Type		Minor Rock Type		Lithology Description
0.00	2.00	M	0.35	CALCRETE		CLAY		soft calcrete/ calc silty clay on mottled silty clay
2.00	4.00	M	0.11	CLAY		SILT		mottled yellow/ochre/red silty clay
4.00	6.00	M	0.03	SILCRETE		SANDSTONE		white silcted f gr sdst, ochre yellow v.f-f gr sdst
6.00	8.00	M	0.03	SANDSTONE				ochre yellow v.f-f gr sdst
8.00	10.00	M	0.04	SANDSTONE				as above
10.00	12.00	M	0.02	SAND		GRAVEL		m gr sand - off white. Cs gr qtz grvls
12.00	14.00	M	0.01	CLAY		GRAVEL		interbedded sandy clay, qtz/qtzte grvl, m-cs sand
14.00	16.00	M	0.01	CLAY		GRAVEL		as above, then fawn clay, ang qtz,mica
16.00	18.00	M	0.01	CLAY		GRAVEL		off-white fawn clay, ang qtz, mica
18.00	20.00	M	0.01	CLAY		GRAVEL		fawn clay+qtz grit/grvl, scattered brown frags, min py
20.00	22.00	M	0.02	CLAY		GRAVEL		as above
22.00	24.00	M	0.02	CLAY		REGOLITH		off white-fawn sandy clay - micac. - saprol. f-m gr gnss tex
24.00	26.00	M	0.03	CLAY		REGOLITH		as above- becoming v. micac (f gr bi/chlor)
26.00	28.00	M	0.03	CLAY		REGOLITH		as above
28.00	28.70	M	0.04	GNEISS				m gr q-f-bi gnss

Strat. From	Log To		Strat. Unit		Major Rock Type		Minor Rock Type		Lithology Description
0.00	1.00	M	Q-ca		CALCRETE		CLAY		soft calcrete/ calc silty clay
1.00	4.00	M	TQau		CLAY		SILT		mottled yellow/ochre/red silty clay
4.00	5.00	M	T-si		SILCRETE		SANDSTONE		white silcted f gr sdst
5.00	15.00	M	Tbw		SAND		GRAVEL		v.f-f gr sdst, f-cs gr sand, grvl, sandy clay
15.00	28.70	M	APs		GNEISS		REGOLITH		m gr q-f-bi gnss, 13.7m weathered profile

Rock From	Samples To		Map	RS No.	Strat Unit		Sample Type	Major Rock		Major Rock Modifier
16.00	24.00	M	6029	277	APs		CUTTINGS	REGOLITH		white-fawn micaceous clay
24.00	28.70	M	6029	278	APs		CUTTINGS	REGOLITH		sandy clay, saprolitic gnss texture
28.00	28.70	M	6029	279	APs		CUTTINGS	GNEISS		m gr q-f-bi, granitic

DRILLHOLE SUMMARY

Drillhole Name: YEELANNA RC 34	Map : 6029	UnitNo :1107	Class : SW
Completion Date :08/06/93	Dip at Collar : -90.00	Elev at Collar : 50.00	Drilling Method : RC
Max. Depth(m) : 39.00	Azimuth at Collar :	Water Cut Depth(m) :	

Log Type	Log Interpreter	Log Date
LITHOLOGY LOG	A J PARKER	08/06/93
SUMMARY STRAT. LOG	L RANKIN	02/07/93

Litho. From	Log To		Mag. Susc (SIUnits*1000)	Major Rock Type		Minor Rock Type		Lithology Description
0.00	2.00	M	0.87	CLAY		SAND		mottled ochre/yellow calcareous sandy clay
2.00	4.00	M	0.12	CLAY		LATERITE		as above, then ferrict/laterite
4.00	6.00	M	0.07	SANDSTONE				v.f-f gr sdst, ochre/yellow-pink & off white
6.00	8.00	M	0.10	SANDSTONE				as above
8.00	10.00	M	0.03	SANDSTONE				as above
10.00	12.00	M	0.02	SANDSTONE				as above
12.00	14.00	M	0.02	SANDSTONE				ochre-yellow to off white f-m gr sdst, min grit
14.00	16.00	M	0.03	SANDSTONE				as above, then gritty micac clay
16.00	18.00	M	0.02	CLAY		CLAY		dk-fawn gritty micac clay
18.00	20.00	M	0.05	CLAY				as above
20.00	22.00	M	0.01	CLAY				as above
22.00	24.00	M	0.06	CLAY		REGOLITH		fawn/khaki sandy clay - f-m gr saprol. granitic text.
24.00	26.00	M	0.01	CLAY		REGOLITH		as above
26.00	28.00	M	0.02	CLAY		REGOLITH		as above
28.00	30.00	M	0.06	CLAY		REGOLITH		as above
30.00	32.00	M	0.02	CLAY		REGOLITH		as above
32.00	34.00	M	0.09	REGOLITH		GNEISS		qtz veins in weathered mica schist/gnss
34.00	36.00	M	0.14	REGOLITH		GNEISS		as above
36.00	38.00	M	0.07	REGOLITH		GNEISS		as above
38.00	39.00	M	0.12	GNEISS				m gr q-f-bi gnss

Strat. From	Log To		Strat. Unit		Major Rock Type		Minor Rock Type		Lithology Description
0.00	3.00	M	TQau		CLAY		SAND		calcareous mottled
3.00	4.00	M	T-fe		LATERITE				ferrict/laterite
4.00	15.00	M	Tbw		SANDSTONE				v.f-m gr sandstone, min grit
15.00	39.00	M	APs		GNEISS		REGOLITH		m gr q-f-bi gnss, 23m weathered profile

Rock From	Samples To		Map	RS No.	Strat Unit		Sample Type	Major Rock		Major Rock Modifier
14.00	32.00	M	6029	280	APs		CUTTINGS	REGOLITH		sandy clay, saprol. gnssic text.
32.00	39.00	M	6029	281	APs		CUTTINGS	GNEISS		highly weathered
38.00	39.00	M	6029	282	APs		CUTTINGS	GNEISS		qtz-fsp-bi gnss

DRILLHOLE SUMMARY

Drillhole Name: YEELANNA RC 35

Map : 6029

UnitNo : 1108

Class : SW

Completion Date : 04/06/93

Dip at Collar : -90.00

Elev at Collar : 50.00

Drilling Method : RC

Max. Depth(m) : 24.80

Azimuth at Collar :

Water Cut Depth(m) :

Log Type	Log Interpreter	Log Date
LITHOLOGY LOG	A J PARKER	04/06/93
SUMMARY STRAT. LOG	L RANKIN	02/07/93

Litho. From	Log To		Mag. Susc (SIUnits*1000)	Major Rock Type		Minor Rock Type		Lithology Description
0.00	2.00	M	0.05	CLAY		CALCRETE		calcrete on mottled sandy/silty clay
2.00	4.00	M	0.04	CLAY		SAND		sandy/silty mottled ochre/yellow/red/grey clay
4.00	6.00	M	0.03	SILCRETE		LATERITE		lateritic silcrete (silcted white f gr sdst, ferrict bands)
6.00	8.00	M	0.04	SANDSTONE				ochre yellow f gr sdst
8.00	10.00	M	0.03	SANDSTONE		SAND		as above, + min m gr sand, min grvl
10.00	12.00	M	0.03	SAND		CLAY		off white f-m gr sand/sandy clay
12.00	14.00	M	0.01	SAND		CLAY		as above
14.00	16.00	M	0.02	CLAY		SAND		white/fawn sandy/gritty clay, ang qtz
16.00	18.00	M	0.02	CLAY		SAND		as above
18.00	20.00	M	0.02	CLAY		REGOLITH		as above, then grey micac clay/schist/gnss
20.00	22.00	M	0.03	CLAY		REGOLITH		as above
22.00	24.00	M	0.06	CLAY		REGOLITH		as above
24.00	24.80	M	0.04	GNEISS				m gr q-f-bi gnss

Strat. From	Log To		Strat. Unit		Major Rock Type		Minor Rock Type		Lithology Description
0.00	1.00	M	Q-ca		CALCRETE				calcrete
1.00	4.00	M	TQau		CLAY		SILT		mottled sandy/silty clay
4.00	5.00	M	T-si		SILCRETE		SANDSTONE		lateritic silcrete devel on f gr qtz sand
5.00	15.00	M	Tbw		SAND		CLAY		f gr sdst, f-m gr sand, sandy/gritty clay, min grvl
15.00	24.80	M	APs		GNEISS		REGOLITH		m gr q-f-bi gnss, 9m weathered profile

Rock From	**Samples** To		Map	RS No.	Strat Unit		Sample Type	Major Rock		Major Rock Modifier
12.00	20.00	M	6029	283	APs		CUTTINGS	REGOLITH		sandy clay
20.00	24.80	M	6029	284	APs		CUTTINGS	GNEISS		weathered
24.00	24.80	M	6029	285	APs		CUTTINGS	GNEISS		m gr q-f-bi, granitic

APPENDIX D

PETROLOGY REPORTS

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31 August 1993

Mr L Rankin
SA Department of Mines & Energy
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REPORT G807800G/93
PETROGRAPHIC DESCRIPTIONS OF A SUITE OF 25 ROCK SAMPLES

YOUR REFERENCE:	36G36A06724000
SAMPLE IDENTIFICATION:	6029 [redacted]RS226-295 (not inclusive)
MATERIAL:	Drill core
LOCATION:	Tumby Bay
DATE RECEIVED:	15 June 1993
WORK REQUIRED:	Preparation of thin sections and brief petrographic descriptions

Investigation and Report by: Dr Alan W Webb and Dr Douglas R Mason

Keith Henley

Dr Keith J Henley
Manager, Mineral Services Laboratory

The results contained in this report relate only to the sample(s) submitted for testing. Amdel Ltd accepts no responsibilities for the representivity of the sample(s) submitted.

hk

PETROGRAPHIC DESCRIPTIONS OF A SUITE OF 25 ROCK SAMPLES

1. INTRODUCTION

Twenty five rock samples from the Tumby Bay district were submitted by Mr L Rankin, SADME, with a request to prepare thin sections and provide brief petrographic descriptions.

2. METHODS

Thin sections (TSC60132-60156) were prepared and stained with alizarin red-S solution before cover slips were attached. Staining of the rock slices with sodium cobaltinitrite was carried out on selected samples to identify K-feldspar. Petrographic descriptions were prepared using conventional transmitted light microscopy.

3. PETROGRAPHIC DESCRIPTIONS

The individual petrographic descriptions follow. Information on field relationships was not provided and no attempt was made to compare petrographic details.

SAMPLE: 6029
[redacted]RS226

ROCK NAME: Quartzo-feldspathic gneiss

HAND SPECIMEN:

This is a pale grey, medium grained crystalline rock with a weak micaceous foliation. White and black micas are both present.

THIN SECTION: C60132

The rock is leucocratic and mainly fine grained, with a partly recrystallised texture. Areas of finer, equant grains in the range 0.1 to 0.4 mm have a granoblastic texture while larger (up to 2 mm), relict grains are cracked or deformed and original crystal margins are obscured by recrystallisation. There is a planar fabric present, but not strongly developed, possibly due to the paucity of mica.

K-feldspar, quartz and plagioclase are the main components of the section. Biotite and muscovite, together, make up less than 5% of the section, with biotite being in excess of muscovite.

K-feldspar is present as both large, sometimes fractured grains and as smaller, equant grains. The larger grains contain inclusions of plagioclase and round blebs of quartz. Fine intergrowths, sometimes approaching myrmekite, are common. Most grains have microcline twinning.

Quartz also occurs as smaller, equant grains with a granoblastic texture and larger grains that show strong strain extinction and incipient recrystallisation to domains of finer grain size.

Plagioclase grains show signs of fracturing but bending of the albite twin lamellae was not observed. A fine clouding by sericitic replacement products is not sufficient to obscure the twinning. The sericite flakes have a random orientation and generally do not exceed 0.02 mm in length.

Biotite flakes are small, usually less than 0.2 mm, and show partial replacement by chlorite and the formation of strings of fine granular opaques along the cleavage planes. Over short distances, the biotite flakes have a parallel alignment.

Muscovite is mainly separate from the biotite and probably coarser grained. In one field, a flake or cluster of flakes of muscovite is intergrown with, or being replaced by mats of fine, colourless needles (0.1×0.01 mm) of ?sillimanite, and in another, muscovite forms a mass of feathery flakes.

A few, rare, cloudy zircons are present.

INTERPRETATION:

The rock is a leucocratic gneiss, the origin of which is unclear, although it is of granitic composition. It has suffered stress-induced recrystallisation, including the formation of sillimanite, with alignment of the biotite flakes. Subsequent, post-metamorphic replacement of plagioclase by sericite and biotite by chlorite has occurred.

SAMPLE: 6029RS230

ROCK NAME: Leucocratic gneiss and chloritised mica schist

HAND SPECIMEN:

Two distinct lithological types are present in this sample. One is pale grey, medium and even grained with weakly aligned strings of biotite. The second is dark, much finer grained and is predominantly micaceous.

THIN SECTION: C60133 (two sections)

The first sample is largely medium grained, up to 3 mm in size but with a fine component grading down to 0.2 mm. The texture is granoblastic but modified by deformation and recrystallisation. Biotite flakes have a weak alignment that tends to follow zones of fracturing.

The rock is composed of K-feldspar, plagioclase, quartz and about 5% of biotite. There is also some rare muscovite and zircon. Replacement minerals include sericite, chlorite and opaques.

K-feldspar is more abundant than plagioclase. It has microcline twinning and is weakly microperthitic. Some grains are fractured and there is some recrystallisation at the grain margins to finer grain size. There are inclusions of rounded blebs of quartz and some fine myrmekitic intergrowths.

Plagioclase forms stubby crystals that are moderately clouded by fine flecks of sericite.

Quartz has intense strain extinction and has recrystallised into mosaics of finer grain size with sutured margins.

Biotite flakes are small - usually less than 0.3 mm - and are aligned along zones of fine fractures. Alteration is present in most flakes, with interleaved chlorite, some secondary quartz and strings of opaque granules. Fine muscovite is also present, probably as a replacement.

The second rock type is fine grained, mostly less than 0.5 mm and is heterogeneous. There are zones of strained, granoblastic feldspar, mats of chlorite that grade into a mixture of chlorite and lepidoblastic biotite, and areas of recrystallised quartz.

The feldspar is cloudy and has rare albite twinning. In places it contains fine needles of an unidentified mineral that have a pronounced parallel alignment.

Irregular patches of fine green chlorite are intergrown with the feldspar and there are small, ragged, elongate grains of altered sphene (or leucoxene) which have a similar alignment to the unidentified needles.

Biotite is present in one main zone where it forms elongated flakes (intergrown with chlorite) with an alignment discordant with that described above. Coarser, equant granules of sphene are associated with this zone. The biotite and chlorite appear to be two independent species, i.e. there is no sign of replacement of one mineral by the other and their form and grain size are distinctly different.

INTERPRETATION:

The first rock type is gneiss that is fairly leucocratic in composition that has been affected by a late metamorphic dynamic event that has strained and recrystallised the quartz, fractured the rock and caused the alignment of some of the biotite along the shears.

The second sample bears no relation to the former. It appears to have been affected by metasomatic processes producing chlorite and possibly 2 episodes of stress acting in discordant directions.

SAMPLE: 6029RS232

ROCK NAME: Granitic gneiss

HAND SPECIMEN:

This is a pale grey, fine to medium grained crystalline rock with a prominent foliation running parallel to the length of the drill core defined by flakes of biotite.

THIN SECTION: C60134

The rock is fine to medium grained with a texture that has been modified by deformation and recrystallisation. Grain size ranges from 1.5 to 2.0 mm down to less than 0.1 mm, the finer grained material having a granoblastic texture. K-feldspar and quartz, in particular, appear to be recrystallising into aggregates of finer grains. A well developed parallel alignment of the biotite flakes defines a foliation.

The main components of the rock are plagioclase, K-feldspar and quartz, in approximately equal proportions with 5 to 10% of biotite, minor sericitic muscovite and accessory opaques and zircon.

Plagioclase forms equant and anhedral grains interlocked with quartz and microcline. Its refractive index is lower than that of quartz, indicating it is of oligoclase composition. Replacement by fine sericite has clouded the plagioclase, often in a selective fashion and some grains have clear, optically continuous selvages. Myrmekitic intergrowths are also present.

K-feldspar has microcline twinning and is clear and unaltered. Inclusions of quartz are common. Clusters of small equidimensional grains appear to be the result of recrystallisation of larger grains.

Quartz is strongly deformed and shows varying stages of recrystallisation. Larger grains are often elongate, parallel to the foliation and have strong strain extinction and incipient recrystallisation to domains of finer grain size.

Biotite flakes up to 0.2 to 0.3 mm in length occur in parallel strings. Associated quartz is frequently fractured parallel to the foliation. The larger biotite flakes contain inclusions that are surrounded by pleochroic haloes.

Fine sericitic muscovite flakes up to 0.4 mm in length are intimately intergrown with or replacing biotite and are concordant with the biotite orientation. These flakes also mantle many of the felsic grains and form along cracks or fractures.

Fine, ragged opaques occur at the margins and along the cleavages of the biotite and may be related to removal of Fe and/or Ti during replacement by muscovite.

INTERPRETATION:

The rock is a gneiss in which the dynamic component of the metamorphism has played an important role. This may have continued after the main phase of metamorphism because some of the fracturing appears to be brittle in character. The fine sericitic muscovite replacement of biotite occurred during this phase. Sericite alteration of the plagioclase is finer grained and has no preferred orientation and probably post-dates the deformation.

There was a degree of mobility of the felsic minerals, possibly after the sericitisation of the plagioclase, with the formation of clear rims and maybe, also, the fine intergrowths of quartz and feldspar.

SAMPLE: 6029RS234

ROCK NAME: Deformed granitic gneiss

HAND SPECIMEN:

This is a pale grey, fine to medium grained crystalline rock, generally of felsic composition but with fine, slightly undulating bands of biotite defining a foliation at a shallow angle to the length of the core.

THIN SECTION: C60135

The rock is fine to medium grained, mainly in the range 0.1 to 1.0 mm but with some larger grains greater than 5 mm in size. Deformation and recrystallisation have occurred, producing the finer grain size throughout much of the section and abundant fractures through the remaining larger grains. Biotite-rich zones with strongly aligned flakes define a foliation.

K-feldspar, plagioclase and quartz make up about 90% of the section, with biotite forming the remainder. K-feldspar appears to be more abundant than plagioclase. Rare zircons are also present. Replacement textures are common e.g., fragments of K-feldspar within pools of quartz and narrow, sodic overgrowths on plagioclase.

K-feldspar forms much of the larger relict grains as well as clusters of smaller grains. Microcline twinning is common. The larger grains contain inclusions of prismatic plagioclase.

Plagioclase has albite twinning that is clouded by fine sericite. As noted above, many plagioclase grains have clear, narrow overgrowths of sodic plagioclase.

Much of the quartz forms small rounded, equant grains. Larger grains have strain extinction and show incipient recrystallisation.

Biotite forms small flakes, rarely exceeding 0.1 mm in length. Larger flakes show strain extinction. There is an alignment of the flakes along narrow, subparallel zones. Within these zones, the felsic grains are finer and quartz is sometimes fractured. Within one zone is a cluster of 12 to 15 small (less than 0.05 mm) equant, colourless, isotropic grains that are probably garnet. Slight alteration of the biotite has produced fine opaque granules.

INTERPRETATION:

The rock is a granitoid that has been subjected to metamorphism with a strong stress component. This has produced the foliation and the fracturing and recrystallisation of much of the felsic component. Mobility of the feldspars has produced overgrowths on plagioclase. The prismatic form of large K-feldspar crystals, and their euhedral plagioclase inclusions, suggest they were primary phenocrysts.

SAMPLE: 6029RS238

ROCK NAME: Weakly deformed granite

HAND SPECIMEN:

This is a grey, fine and even-grained rock of granitic composition. The small sample size does not give a clear indication of any metamorphic fabric.

THIN SECTION: C60136

The rock is fine to medium grained with a high proportion of grains between 1.0 and 1.5 mm in size. It has a hypidiomorphic granular texture, perhaps slightly modified by recrystallisation. There is no distinct foliation present, but narrow, discontinuous zones of fine grained recrystallised felsic minerals with biotite flakes aligned along the fractures are present. Elsewhere, biotite appears to have a random orientation.

The sample is of granitic composition with K-feldspar slightly in excess of plagioclase and abundant quartz. The only other mineral of major importance present is biotite. Accessory zircon and minor secondary opaques and sericite are also present.

K-feldspar forms mainly equant, anhedral grains with microcline twinning. There are inclusions of plagioclase as well as some fine perthite.

Plagioclase is also equant to tabular in shape, with albite twinning almost obscured by fine grained (sericitic) alteration products. The fine perthitic strings in the microcline also show cloudy alteration. Myrmekitic intergrowths with quartz are common and the plagioclase is probably of oligoclase composition.

Quartz occurs as irregularly-shaped, interstitial masses with strong strain extinction and exhibiting varying stages of recrystallisation. Small rounded blebs are common in the K-feldspar.

Biotite flakes are up to 0.6 mm in length and are partly replaced by chlorite and strings of fine opaque granules. Small flakes of sericite have also developed as a replacement of the biotite. As noted above, some biotite flakes are aligned along narrow zones of recrystallised felsic minerals, probably representing fine shears. In some places, this material, with fine sericite, mantles the larger feldspar grains.

The rare zircon grains present are clouded.

INTERPRETATION:

The rock appears to be predominantly igneous (granitic) in character but has suffered some deformation, with accompanying recrystallisation confined mainly to narrow zones although the quartz throughout the section is seen to be recrystallising. Sericite replacement of the plagioclase and formation in the shears was probably contemporaneous and occurred later than the shearing.

SAMPLE: 6029RS241

ROCK NAME: Deformed granite

HAND SPECIMEN:

This is a pale grey, fine grained rock of granitic appearance, and black mica flakes that have a weak parallel alignment.

THIN SECTION: C61037

The rock is strongly deformed and recrystallised. A small proportion of the grains is between 2 and 5 mm in size but most are finer than 1 mm. Quartz grains are elongate and the biotite flakes are oriented with the cleavage direction parallel to fine zones of recrystallised felsic minerals.

The section is composed mainly of K-feldspar, plagioclase and quartz, with biotite making up the remaining 5 to 10%. K-feldspar and plagioclase abundances are approximately equal. Occasional zircon grains were noted and sericite/muscovite, chlorite and fine opaque granules are of secondary origin.

K-feldspar forms irregularly-shaped grains with inclusions of plagioclase and quartz. Microcline twinning is common. Aggregates of smaller, interlocked grains occur in the recrystallised shear zones.

Plagioclase is clouded by fine sericite. Evidence of deformation can be seen in bent albite twin lamellae and off-setting of the twinning in fractured grains. Myrmekitic intergrowths with quartz are common and, as there is no difference in relief between these two minerals, the plagioclase composition is that of andesine.

Quartz shows the greatest effects of the deformation. Some grains appear to have undergone plastic flow, and the larger ones are elongated. Strain extinction is severe and recrystallisation into mosaics of fine (less than 0.1 mm) grain size, with sutured margins, is well advanced.

Biotite flakes are ragged and altered, and are strung out along zones of more intense deformation or recrystallisation. The mineral is altering to chlorite and has strings of fine opaque granules along the cleavage planes. Zircon inclusions are also iron-strained. In addition, fine (0.03 mm) muscovite or sericite is intergrown with the biotite or occurs as selvages between the biotite and adjacent felsic minerals. This sericitic muscovite is not abundant, but is widely distributed, especially in the finer grained recrystallised zones and in strings that outline larger felsic grains.

INTERPRETATION:

The sample is similar to the preceding one (6029RS238) but it has suffered greater deformation and the recrystallisation is much more widespread. It appears to have had a similar origin and history.

SAMPLE: 6029RS243

ROCK NAME: Hornblende-biotite gneiss

HAND SPECIMEN:

The sample is a dark grey, fine grained rock with a foliation defined by curved bands of mafic minerals.

THIN SECTION: C60138

The rock is fine and even grained, with most minerals in the range 0.1 to 0.6 mm. The texture is granoblastic and, although a gneissic foliation can be seen on a macro scale, alignment of individual mineral grains is not a dominant feature of the section. There are variations in proportions of felsic and mafic minerals across the section producing a weak mineralogical layering that reinforces the gneissic foliation.

The rock is composed of plagioclase, quartz, hornblende, biotite and K-feldspar with accessory apatite and zircon.

Plagioclase is the dominant feldspar present and forms equant, anhedral grains. Exsolution textures are widespread, and many grains have well-developed anti-perthite textures with abundant fine rods of K-feldspar. Round blebs of quartz are also common. Incipient replacement of plagioclase by fine phyllosilicates occurs in an irregular, patchy fashion and occasionally this replacement has developed into recognisable small flakes of sericitic muscovite. The refractive index of the plagioclase is almost identical to that of quartz, indicating an andesine composition.

Quartz is intergrown with plagioclase as equant grains with a weak strain extinction.

K-feldspar is not abundant as a separate mineral phase. A few small grains with microcline twinning are present, but would be less abundant than the exsolved K-feldspar in the plagioclase.

The mafic minerals, hornblende and biotite, are usually intergrown, although in varying relative proportions.

Amphibole is strongly pleochroic from brown to dark green. Most grains are equant and anhedral, but a few larger, poikiloblastic grains show strain extinction and appear to be breaking down to clusters of finer grains. Biotite flakes included within the large hornblende domains, tend to have a parallel alignment or are intergrown along cleavages or incipient new grain boundaries.

Biotite flakes, pleochroic tan-brown to pale yellow, are small well developed and up to 0.5 mm in size. This mineral is very fresh with only very minor formation of opaque strings at grain margins. In places, there is a parallel alignment of the flakes, but mostly, the orientation is random.

Small, subhedral apatite is relatively abundant, and subrounded zircon is rare.

INTERPRETATION:

This is a gneissic rock of intermediate composition formed by medium to high grade regional metamorphism of a precursor of possible igneous origin. A good granoblastic texture has developed and mineral phases appear to be in equilibrium. Exsolution of K-feldspar and the formation of anti-perthite occurred during slow cooling. The very mild replacement of some of the plagioclase by phyllosilicates occurred after the formation of the anti-perthite.

SAMPLE: 6029RS246

ROCK NAME: Amphibolite

HAND SPECIMEN:

The sample is a dark, fine grained rock with a high proportion of mafic minerals, including biotite. Felsic minerals occur in clots and thin, sub-parallel strings, producing a gneissic foliation.

THIN SECTION: C60139

The rock is fine and even grained, with a grain size ranging from 0.1 to 1.0 mm. There is a well developed metamorphic texture, ranging from granoblastic to lepidoblastic and a foliation produced mainly by the parallel alignment of many of the biotite flakes. Weak strain effects are seen occasionally in curved twin lamellae and fracturing of plagioclase grains.

The main mineral components are plagioclase, hornblende, biotite and quartz. Apatite makes up 1 to 2% of the section, with a trace of opaques and rare zircon.

Plagioclase forms equant grains with both albite and pericline twinning. Granoblastic texture is well developed. The refractive index is equal to or slightly higher than that of quartz, indicating a calcic andesine composition. Replacement by phyllosilicates is patchy. In places it is confined to alternate twin lamellae while elsewhere in the section are areas with almost total replacement and development of feathery flakes of sericitic muscovite.

Quartz occurs as rounded, equant grains, intergrown with the plagioclase and showing little or no strain extinction. Small rounded blebs are also present as inclusions or exsolutions within the plagioclase.

The hornblende is dark green to brown and forms equant to short tabular interlocking grains. Larger crystals are weakly poikiloblastic. There is a close, interlocking relationship with flakes of biotite, and apatite also tends to favour this association.

Biotite flakes, pleochroic fox-brown to pale yellow, tend to be elongate and thin (0.6 mm × 0.04 mm) and have a strong parallel alignment. This mineral is very fresh, with only very minor traces of opaque granules along flake margins, and no evidence of strain.

INTERPRETATION:

The rock is a gneiss or amphibolite, produced by medium to high grade (amphibolite facies) regional metamorphism, possibly of an intermediate igneous rock. Metamorphic conditions were maintained to produce a mineral assemblage that is in equilibrium and a good, granoblastic to lepidoblastic texture. Subsequently, patchy sericitic replacement of the plagioclase occurred.

SAMPLE: 6029RS248

ROCK NAME: Granitic gneiss

HAND SPECIMEN:

The sample is a fine grained, cream to pink, crystalline rock with a well developed parallel layering of biotite roughly concordant with the length of the core.

THIN SECTION: C60140

The rock is fine to medium grained, ranging from 0.1 to 2.0 mm in grain size. Deformation and some recrystallisation of the larger grains have occurred and a gneissic foliation has been produced by elongation of quartz grains and the parallel orientation of biotite flakes along narrow ?shears.

K-feldspar and plagioclase are present in approximately equal abundance and, with quartz and biotite, make up most of the section. About, 1% of muscovite is present, with accessory zircon.

K-feldspar forms some of the larger grains in the section, which often have small inclusions of plagioclase, and also occurs as smaller grains, perhaps reduced in size by deformation and recrystallisation. Microcline twinning is common, particularly in the finer grains.

Plagioclase forms equant, sometimes tabular grains with common rounded inclusions of quartz. The composition is oligoclase-andesine. In some areas, the texture is granoblastic but near the zones of more intense strain, both feldspars are extensively cracked and recrystallisation has produced aggregates of finer, rounded grains. Fine intergrowths, often of quartz in plagioclase, are common.

Quartz commonly occurs as elongate grains with strong strain extinction and incipient recrystallisation to clusters of finer grain size. The elongation is parallel to the foliation defined by the biotite.

Biotite is concentrated in zones where the strain effects are most prominent and the flakes are strung out with their cleavage parallel to the foliation. The biotite is intensely pleochroic dark brown to pale yellow, and exhibits varying types and degrees of alteration. Dark strings of opaques parallel to the cleavage are common and there is patchy chloritic replacement. Fine flakes of muscovite are interleaved with the biotite and appear to be a replacement product.

Strings of dark brown secondary alteration products emanate from the biotite and fill fractures through the feldspars and quartz.

Zircons are small, usually finer than 0.05 mm, and are cloudy and coated with Fe oxides.

A fine sericitic alteration of plagioclase is fairly widespread, often preferentially replacing alternate twin lamellae.

INTERPRETATION:

The rock was possibly of granitic origin but has been recrystallised during medium grade regional metamorphism. A strong dynamic component continued after the main period of metamorphism, producing narrow shears along which the biotite was aligned. These shears have probably remained open as channelways assisting fluids in the alteration of biotite and production of secondary Fe oxides as fillings in the fractures.

Sericitic alteration of plagioclase was a post-metamorphic event.

SAMPLE: 6029RS250

ROCK NAME: Plagioclase-biotite gneiss

HAND SPECIMEN:

The rock is pale to medium grey with a fine and even grain size. Closely spaced bands of high biotite concentration alternate with white felsic layers.

THIN SECTION: C60141

The sample is fine grained, mainly in the size range from 0.1 to 0.6 mm, but with biotite flakes up to 1 mm in length. There is a granoblastic texture, with an exsolution texture of abundant rounded, blebs of quartz super-imposed, and a strong parallel gneissic foliation defined by bands of aligned flakes of biotite.

The rock is composed of plagioclase, quartz and biotite, with minor opaques and accessory apatite and zircon. K-feldspar appears to be absent except as fine intergrowths or exsolution lamellae in the plagioclase.

Plagioclase forms equant to short tabular crystals, interlocked with quartz in a granoblastic texture. Small (0.02 mm) blebs of exsolved quartz are common within the plagioclase and in some grains there is a fine micro-antiperthite with parallel strings of K-feldspar. This texture, however, is not as well developed as in 6029RS243. The refractive index of the plagioclase is slightly lower than that of quartz, indicating an oligoclase-andesine composition.

Quartz occurs as anhedral grains with slightly rounded or lobate margins. There is a tendency to elongation parallel to the foliation and most grains have strain extinction and incipient recrystallisation.

Biotite forms brown to brownish-green flakes up to 1.0 mm in length, generally in bands of high concentration and with an orientation parallel to the foliation. Within one biotite band is a sub-rounded patch composed of disseminated, fine opaque granules in a pale brown clay matrix. From the shape, this may once have been garnet. Rare alteration of the biotite elsewhere has produced ?clays and Fe oxides. Fine, rod-like opaques are common along the biotite cleavage planes and in places, fill irregular fractures in plagioclase or outline grain margins.

There is an incipient sericite replacement of plagioclase, often confined to cleavage planes or specific twin lamellae.

INTERPRETATION:

This rock was formed by medium to high grade regional metamorphism to produce a stable mineral assemblage and granoblastic texture, with a pronounced alignment of the biotite. Exsolution of quartz and minor K-feldspar occurred during slow cooling. The minor alteration of biotite and sericite replacement of plagioclase were post-metamorphic events.

SAMPLE: 6029RS253

ROCK NAME: Altered hornblende-biotite quartzo-feldspathic gneiss

HAND SPECIMEN:

The sample consists of four very small chips of a grey, fine grained crystalline rock. The small size of the chips did not allow recognition of any textural characteristics.

THIN SECTION: C60142

Four small chips are included in this section. They are variable in appearance and mineralogy and presumably are indicative of a heterogeneous rock.

The grain size is variable, with some large feldspars and quartz up to 5 or 6 mm in size surrounded by much finer grained (less than 0.5 mm) areas. There is a weak parallel alignment of biotite flakes in the finer grained material, giving the sample the appearance of an augen gneiss.

K-feldspar, plagioclase, quartz and biotite are present in all chips. In addition, hornblende occurs in two chips while carbonate (unstained by alizarin red-S) occurs in the other two. Relatively large (0.5 mm) apatite grains are common in some chips.

The large K-feldspars have microcline twinning and the margins are modified and intergrown with small rounded grains of quartz and plagioclase, often in myrmekitic intergrowths.

In the finer matrix, plagioclase, K-feldspar and quartz are intergrown in a complex fashion that is granoblastic in places but partly obscured by intergrowth textures and heavy cloudy alteration of plagioclase.

Biotite forms small, almost equidimensional flakes with a parallel but not persistent alignment. The biotite is intergrown with green hornblende in two of the chips. The hornblende is quite extensively replaced by phyllosilicates along cleavages and only ragged remnants are preserved. The carbonate in other chips is also associated with the biotite and sometimes has a tabular shape and is cut by a network of phyllosilicates and/or clays, which suggests that the carbonate is replacing hornblende. Biotite tends to be replaced by chlorite where it is in proximity to the carbonate.

INTERPRETATION:

This rock appears to be a granitic gneiss with some larger relict grains or augen of K-feldspar and quartz. Biotite is evenly distributed through the matrix but hornblende is more segregated. The segregations of relatively large apatite crystals are also unusual.

Post-metamorphic alteration has caused sericitic alteration of plagioclase, chlorite replacement of biotite and carbonate and clay replacement of hornblende.

SAMPLE: 6029RS255

ROCK NAME: Granitic gneiss

HAND SPECIMEN:

The sample is a pale grey, fine even grained crystalline rock, composed of quartz, feldspar and biotite. The hand specimen is too small to allow recognition of any metamorphic textures.

THIN SECTION: C60143

The rock is fine to medium grained, with a significant proportion of grains between 1 and 2 mm. The sample is leucocratic, with a well developed granoblastic texture and biotite flakes have a weak preferred orientation.

The rock is granitic in composition, with K-feldspar, plagioclase and quartz making up over 98% of the section. Biotite and a trace of apatite and zircon make up the remainder of the rock. K-feldspar is more abundant than plagioclase.

K-feldspar forms equant, anhedral grains with microcline twinning. Some of the larger grains contain inclusions of plagioclase and rounded quartz.

Plagioclase occurs as equant to short tabular crystals with albite twinning. Moderate clouding due to replacement by fine sericite is common, sometimes in a selective pattern either following the twinning or normal to the twin planes. A number of grains have clear narrow rims or overgrowths in which the twinning is continuous with that in the rest of the grain. Some of these rims also have fine, worm-like quartz intergrowths.

Quartz is irregularly shaped with slightly rounded margins. Strain extinction and incipient recrystallisation is common.

Biotite is rare and confined mainly to one part of the section. Flakes are small (less than 0.2 mm) and interleaved with minor chlorite and strings of Fe oxides. A few small and subrounded granules of zircon are associated with the biotite.

INTERPRETATION:

The rock is a granitic gneiss, formed probably from a leucocratic granite by medium to high grade regional metamorphism. A weak foliation was produced by alignment of the biotite. Sericite replacement of plagioclase was a later retrogressive event.

SAMPLE: 6029RS257

ROCK NAME: Deformed granite

HAND SPECIMEN:

The sample is a pale grey, fine to medium grained crystalline rock with a granitic appearance. No foliation could be detected in the small hand specimen.

THIN SECTION: C60144

The rock is fine to medium grained with a maximum grain size of about 3 mm and grading down to about 0.2 mm. Deformation has caused fracturing and recrystallisation of many grains, with alignment of micas along the fractures. The chips used to prepare the section are not large enough to show whether there is a consistent lineation in the rock.

The sample contains mainly K-feldspar, plagioclase and quartz, with about 5% of biotite. There is minor secondary sericitic muscovite, iron oxides and clays.

K-feldspar and plagioclase occur in roughly equal proportion. K-feldspar is fresh, with microcline twinning and forms some of the larger crystals in the section. Narrow cross-fractures contain fine sericite/muscovite. The larger grains are often mantled by much finer grained ?recrystallised minerals.

Plagioclase is often tabular and of igneous appearance. Albite twinning is common and replacement by sericite that in places has developed to fine muscovite is widespread. In some places the sericite flakes are randomly oriented but elsewhere they are aligned either parallel to or almost at right angles to the albite twinning. The refractive index of the plagioclase is equal to or slightly lower than that of quartz, indicating an oligoclase - andesine composition.

Quartz forms anhedral grains with strong strain extinction. Recrystallisation to domains of finer grain size has occurred and these grains have sutured margins.

The section is cut by fine shears that have fractured many of the felsic grains. Biotite flakes are aligned along the shears, and have been extensively altered and leached so that the flakes are almost colourless and interleaved with thin lenses of secondary silica and strings of granular opaques. Small flecks of muscovite are also present in this assemblage.

Muscovite, as well as forming in fractures as noted above, also occurs as fine strings along grain boundaries.

INTERPRETATION:

The rock has many characteristics of a granite but has been deformed, accompanied by fracturing of feldspars and recrystallisation, especially of the quartz. Biotite has been strung out along the shears which have subsequently served as channelways along which movement of fluids caused the degradation of the biotite. The sericitic alteration of plagioclase and formation of fine muscovite along fractures and grain margins probably accompanied this alteration event.

SAMPLE: 6029RS259

ROCK NAME: Leucocratic (granitic) gneiss

HAND SPECIMEN:

The sample is a white to cream, fine to medium grained crystalline rock containing quartz, white altered feldspar and mafic minerals. The rock fragment is too small to permit any further description.

THIN SECTION: C60145

The section is made from 5 small rock chips. The sample is fine to medium grained with a size range between 0.15 and 1.5 mm and has a granoblastic texture. Biotite flakes are not abundant, but tend to be aligned along the numerous fine cracks or shears that cut the rock. The felsic minerals are mainly equant and show little or no sign of a foliation.

The rock is leucocratic, with K-feldspar, plagioclase and quartz making up about 95% of the section. The remainder is biotite with a few small, metamict zircons. Secondary sericite has formed from plagioclase and iron oxides from alteration of biotite.

K-feldspar is more abundant than plagioclase. A few larger crystals have fine perthitic rods but most contain only inclusions of plagioclase and quartz. Microcline twinning is common.

Plagioclase tends to be slightly finer grained than the microcline. It has albite twinning that is partly masked by fine sericitic alteration, although not to the extent suggested by the appearance of the feldspar in the rock chip. The alteration is patchy and sometimes favours specific twin lamellae. Some fine myrmekitic intergrowths with quartz are present. The plagioclase is a sodic variety - possibly oligoclase.

Quartz is anhedral and has a strong strain extinction. Partial recrystallisation to finer grained mosaics has occurred.

The rock chips are traversed by a number of shears or fractures that intersect individual grains and along these fractures flakes of biotite are aligned. This mineral is strongly pleochroic and, in most of the section, only weakly altered to produce strings of exsolved Fe oxide granules and interleaved chlorite.

There are also a few grains, about 0.3 mm in size, composed of colourless, isotropic ?clay with fine, needle-like opaque inclusions. These do not appear, from their form, to be a replacement of biotite.

INTERPRETATION:

The rock is a leucocratic granitic gneiss, formed during medium to high grade regional metamorphism. The equigranular nature of the rock suggests that directional stress did not operate until a late stage of the metamorphism, when what was possibly a brittle fracturing occurred and the biotite flakes were aligned along the fractures.

SAMPLE: 6029RS261

ROCK NAME: Leucocratic gneiss

HAND SPECIMEN:

The sample is a pale grey, leucocratic, medium grained crystalline rock in which there is a strong preferred orientation of prismatic feldspar.

THIN SECTION: C60146

The section is made from 3 small rock fragments. The rock is medium grained, in the range between 1 and 6 mm. The texture is granoblastic, and has been slightly modified by recrystallisation along the margins of some grains. The alignment of crystals observed in the hand specimen is not exhibited in the section, possibly because the section has been cut across the lineation.

The sample is very leucocratic, with K-feldspar, plagioclase and quartz making up about 99% of the section and with fine sericitic muscovite and rare zircon comprising the remainder.

K-feldspar is more abundant than plagioclase and forms large tabular crystals with inclusions of subhedral, equant plagioclase and small blebs of quartz. Strings of perthite occur in some crystals and which is more sodic than the plagioclase elsewhere in the rock. Microcline twinning is common. Cross fractures are present, which distort or offset some crystals, and finely (0.1 mm) recrystallised minerals have developed along grain margins.

Plagioclase forms smaller, stubby, subhedral prismatic crystals with albite twinning. The twin lamellae are sometimes curved or offset and fine fractures are filled with flakes of sericitic muscovite up to about 0.03 mm in length. This material also occurs in fractures through the K-feldspar and along grain margins, and is coarser grained than the very fine phyllosilicate alteration that clouds much of the plagioclase. Some clear, optically continuous overgrowths are present on the plagioclase.

Quartz shows strong strain extinction and is partly recrystallised into domains of finer grains with sutured margins.

In addition to the evidence of stress seen in the feldspars and quartz, described above, there are numerous fine fractures that form a lacy, random network, filled with opaque ?Fe oxide. There are one or two larger (0.5 mm) patches of skeletal opaques that may be replacing a primary mineral and these have a narrow rim of well formed muscovite. Fine opaque strings radiate out from these patches. A few, metamict zircons, up to 0.5 mm in size also have rims and internal fractures filled with opaques.

INTERPRETATION:

The rock is a leucocratic gneiss that has suffered subsequent deformation, producing brittle fracturing and minor recrystallisation at grain margins and in the quartz.

Subsequent oxidation of the rare ?mafic grains has produced secondary Fe oxides that fill many of the fine fractures. This event appears to have been accompanied by the formation of fine grained muscovite which also fills fractures and lines grain margins.

SAMPLE: 6029RS263

ROCK NAME: Pegmatitic granitoid

HAND SPECIMEN:

The sample is a pale grey, medium grained, crystalline, leucocratic rock with coarse intergrowth textures between quartz and feldspar.

THIN SECTION: C60147

The rock is medium grained, mainly in the range from 2 to 6 mm and has an allotriomorphic granular texture with some well developed intergrowths giving the section a pegmatitic appearance. Some fine graphic intergrowths of worm-like quartz in K-feldspar are also present.

The sample is very leucocratic and is composed almost entirely of plagioclase, K-feldspar and quartz, with rare biotite and zircon.

Plagioclase is possibly of equal or greater abundance than K-feldspar, although the small area of the section may not be representative for a rock of this grain size. Albite twinning is well developed and a weak compositional zoning is present in some grains. Plagioclase forms elongate but anhedral crystals interlocked with lobate quartz. There are small areas where replacement of plagioclase by perthitic K-feldspar has occurred and sericitic alteration is widespread but patchy. The refractive index of the plagioclase is close to or slightly lower than that of quartz, indicating an oligoclase-andesine composition.

K-feldspar is anhedral and weakly microperthitic and there are small inclusions of plagioclase in varying stages of replacement. The K-feldspar is unaltered, but there is a slight clouding of the plagioclase, both as inclusions and as perthitic strings.

Quartz shows evidence of strain and has recrystallised into mosaics of finer grain size. These grains contain numerous lines of fine, sub-microscopic inclusions that may represent sealed fractures.

A few ragged flakes of biotite are present and exhibit alteration and replacement by fine muscovite and strings of opaque granules along the cleavage.

INTERPRETATION:

This rock had a magmatic origin and is finely pegmatitic in appearance. Quartz and K-feldspar have a late stage intergranular form; potassic replacement of some of the plagioclase occurred in the final stages of crystallisation. Subsequent stresses have deformed and partly recrystallised the quartz but did not affect the feldspars.

SAMPLE: 6029RS265

ROCK NAME: Deformed granitic gneiss

HAND SPECIMEN:

The remaining rock chip is too small to describe.

THIN SECTION: C60148

The rock is fine grained, mainly in the range 0.1 to 1 mm and has a granoblastic texture that is slightly overprinted by partial recrystallisation of quartz. A faint foliation is defined by flakes of mica aligned along lines of fracture or shearing.

K-feldspar, plagioclase and quartz are the main components with about 5% of biotite and rare apatite and zircon. A trace of fine grained ?secondary muscovite is also present.

One large (4 mm) crystal of K-feldspar is present but the rest of the section contains smaller, equant grains, often as aggregates. Most grains have microcline twinning and rounded inclusions of quartz are common. Inclusions of plagioclase also occur.

Plagioclase is anhedral and often has rounded margins or overgrowths in which fine worm-like to myrmekitic intergrowths with quartz occur. Twinning is uncommon. The refractive index is almost identical to that of quartz, indicating an andesine composition. There is a very fine grained and localised incipient alteration of the plagioclase to sericite.

Quartz appears to have recrystallised to form mosaics of finer grains. Strain extinction is weaker than that noted in most other samples in this suite.

A network of sub-parallel fractures cut between and across grains and much of the biotite appears to be associated with these fractures. The biotite flakes are ragged and fine grained (less than 0.1 mm) and totally replaced by a colourless low-birefringent mineral (?chlorite), fine opaque granules and muscovite. Many of the fractures are also filled by strings of opaque material. The rare zircons are also coated by opaques.

INTERPRETATION:

The rock is a leucocratic (granitic) gneiss, possibly formed from an igneous rock by medium to high grade regional metamorphism. Dynamic metamorphism occurred after the main phase of metamorphic recrystallisation to produce fine shears and the alignment of much of the biotite along the shears. These fractures later provided channelways for the passage of fluid that totally replaced the biotite and deposited Fe oxides in the fractures.

SAMPLE: 6029RS268

ROCK NAME: Sheared gneiss with alteration zones

HAND SPECIMEN:

The sample is pale grey, fine to medium grained with concentrations of biotite in narrow zones. The sample is not large enough to give a clear indication of texture.

THIN SECTION: C60149

The section is made from 6 small chips and a composite description is given below.

The rock is fine to medium grained and has been strained and recrystallised so that quartz domains up to 3 mm in size are composed of much smaller grains. The texture is therefore a modified granoblastic one with a foliation produced by alignment of biotite flakes.

Plagioclase, K-feldspar, quartz and biotite are the major primary minerals, with accessory opaques, zircon and garnet. Sericite, clay minerals, carbonate and opaques are present as secondary, alteration products.

Plagioclase forms equant to tabular crystals, 1 to 2 mm in size and also occurs as smaller grains included within K-feldspar. Clouding by fine sericite is relatively intense although twinning is not obscured. The composition is that of andesine.

K-feldspar is unaltered, although the plagioclase inclusions are clouded. The mineral has microcline twinning and is microperthitic.

Quartz shows signs of severe strain. Undulose extinction is intense and there has been a major recrystallisation to finer grained mosaics with sutured to granoblastic texture.

Biotite comprises about 10% of the section. It is strongly pleochroic in shades of red-brown and concentrations of flakes up to 1 mm in length occur in parallel alignment. Cleavage planes are often curved. Intergrown with the biotite is a much finer grained muscovite that appears, in places, to be replacing the biotite. Fine opaque granules are also associated with this alteration.

One chip represents a zone of poorly consolidated material in which the biotite is more extensively replaced by almost colourless ?chlorite and feldspar is replaced almost totally by pale brown clay minerals. Also present in this strongly altered area are irregularly shaped patches of a pale yellowish-brown carbonate that is not stained by alizarin red-S. The form does not suggest replacement of any specific mineral. Fragmental quartz is present in this zone which appears to be a broad shear zone.

INTERPRETATION:

The rock is a gneiss, produced by medium to high grade regional metamorphism, possibly of an igneous rock of granitic to intermediate composition.

Dynamic stresses subsequent to metamorphism have strained and recrystallised the quartz and produced shear zones along which extensive alteration has taken place. This degree of alteration was not noted in previous gneisses with evidence of shearing, and perhaps the abundance of biotite in the present sample aided in the formation of a wider and presumably more permeable shear zone.

SAMPLE: 6029RS269

ROCK NAME: Sandy clay

HAND SPECIMEN:

The sample is a pale green, weathered and poorly consolidated, fine grained clay material described in the application sheet as regolith. Felsic grains are surrounded by a green ?chloritic matrix.

THIN SECTION: C60150

The section is composed of fragments, mostly less than 1 mm in size and in most cases, monomineralic. They are rounded to angular and roughly equidimensional and are set in a finer grained micaceous matrix. The samples doe not appear to be a deeply weathered but still in-situ crystalline rock, but rather residue from weathering that has undergone little or no transport.

The clastic material consists mainly of quartz and microcline, with flakes of degraded biotite and a few opaques. The composite particles are quartz-microcline, with metamorphic textures similar to those in the gneisses described in preceding samples. Quartz has strain extinction and the feldspar has microcline twinning. The rounded preserved clasts are present in the original particle shape rather than produced by attrition during transport. There is, however, an indication of transport in the presence of a small (1.0 mm) fragment of siltstone enclosed by the main components.

The matrix is composed of very fine grained, weakly anisotropic clays and/or chlorite, with a few slightly larger flakes of phyllosilicates. Small (less than 0.05 mm) ragged granules of carbonate are scattered through the matrix; most of this mineral probably developed in-situ rather than derived from the parent rock. The carbonate is not stained by alizarin red-S, and may therefore be dolomite.

The matrix comprises about 50% of the section. There is no indication of bedding, and the degraded primary biotite flakes and the finer ?diagenetic phyllosilicates tend to wrap around individual quartz and microcline clasts.

INTERPRETATION:

This sample represents unsorted debris produced by weathering of a metamorphic terrain. Plagioclase appears to be absent, while the microcline present has a very fresh appearance. This observation is in accord with the relative states of alteration of the two feldspars in the gneisses described previously. The presence of a fragment of siltstone indicates that some transport has occurred, but this must have been of very limited nature, as there is no obvious sorting of the clasts, and a high percentage of clay matrix remains. Weak diagenesis has recrystallised the clays and scattered carbonate has been introduced.

SAMPLE: 6029RS276

ROCK NAME: Granitic gneiss

HAND SPECIMEN:

The sample is a pink, medium grained crystalline rock composed of quartz, pink feldspar and dark biotite. No foliation could be observed because of the small sample size.

THIN SECTION: C60151

The rock is medium grained, mainly in the size range between 1 and 3 mm but with some finer grained material produced by recrystallisation. There is no persistent foliation in the section, although alignment of biotite flakes occurs over short distances (a few millimetres). Biotite, plagioclase and quartz all show evidence of strain.

The main components of the section are K-feldspar, plagioclase, quartz and biotite. Apatite is relatively abundant as an accessory mineral and coarser grained than in previously described samples. Small, metamict grains of zircon make up the remainder of the primary minerals. Alteration and replacement has produced chlorite, opaques (some of which may be leucoxene), ?rutile, sericite and carbonate. A few small areas, now composed of fine clays and phyllosilicates, may represent original grains of garnet.

K-feldspar is finely microperthitic, with microcline twinning. Small inclusions of plagioclase are common. Margins of the larger grains are often lined by fine (0.03-0.05 mm) aggregates of both feldspars and strings of recrystallised grains also lie along internal fractures.

Plagioclase is often strongly clouded and replaced by sericite as flakes up to 0.03 mm in length. Some fine myrmekitic intergrowths are present. In some less altered grains, deformed albite twin lamellae can be seen.

Quartz has strong strain extinction and has recrystallised into mosaics of fine grains (as fine as 0.02-0.03 mm) with sutured margins.

Strained biotite flakes are up to 3 mm in length. They may have a parallel alignment over short distances but no consistent orientation. The biotite is olive-green in colour and is replaced to varying degrees by chlorite. Strings of fine, granular opaques, which may be leucoxene, are common and fine needle-like opaques in sets with 120° orientation are probably rutile. The biotite is closely associated with apatite and zircon. Some apatite crystals are almost 1 mm in length and are frequently cracked, with carbonate filling these fractures. Also associated with the biotite are 2 or 3 equant shapes up to 1 mm across that may have been garnet but are now composed of fine grained, weakly anisotropic clays. In addition to the biotite described above, there are minor quantities of a finer grained and possibly secondary or recrystallised biotite. This mineral is also green, but flakes are usually smaller than 0.1 mm and form aggregates that string out along grain margins and fractures.

INTERPRETATION:

The sample is a granitic gneiss formed during medium to high grade regional metamorphism, probably of a granitic precursor. Dynamic metamorphism subsequent to the main phase of crystallisation, has deformed the quartz and biotite and caused partial recrystallisation of these minerals, with fine grained secondary biotite filling grain boundaries and fractures.

Retrogressive replacement of ?garnet by clay minerals, plagioclase by often well developed sericite and biotite by chlorite, with exsolution of Ti-minerals has occurred subsequent to the deformation.

SAMPLE: 6029RS279

ROCK NAME: Deformed granitic gneiss

HAND SPECIMEN:

The sample is a grey, fine and even grained crystalline rock with fairly abundant biotite forming parallel strings of aligned flakes.

THIN SECTION: C60152

The rock is fine to medium grained, with a maximum grain size of about 2 mm and grading down to about 0.5 mm. The section contains narrow zones of intense deformation, along which biotite flakes are aligned and recrystallisation of quartz has occurred. Albite twinning in plagioclase is strongly deformed.

The main mineral components are K-feldspar, plagioclase, quartz and biotite. Accessory minerals include apatite and zircon. Secondary minerals include fine sericitic muscovite, recrystallised biotite and opaques.

The K-feldspar and plagioclase occur in approximately equal proportions. K-feldspar is unaltered, and is microperthitic with microcline twinning. This mineral appears least affected by deformation and crystals are surrounded by zones of fine grained recrystallised quartz and, to a lesser degree, plagioclase.

Plagioclase is of oligoclase-andesine composition and is only lightly clouded with very fine replacement minerals and has scattered, 0.02 mm sized flakes of sericite. Crystals are deformed, with strongly curved twin lamellae, and show replacement by K-feldspar. Rounded, myrmekitic grains, usually adjacent to K-feldspar are common. In some zones, recrystallisation to a finer grain size has occurred.

Some of the larger quartz grains are elongate, parallel to the zones of greatest deformation. These show strain extinction and incipient recrystallisation. In the more intensely deformed areas, the quartz is ribbon like and forms mosaics of tiny grains (less than 0.05 mm).

Biotite is olive-green in colour and forms flakes up to 2 mm in length. The flakes are intensely deformed, some showing multiple kinking at a spacing of 0.1 mm. The biotite is altered, in places, to chlorite and there are abundant strings of fine opaque ?leucoxene granules. In places, the biotite has recrystallised to clusters of much finer (less than 0.1 mm) grain size.

Apatite and zircon occur intergrown with the biotite, and in places, a very fine grained muscovite is intergrown, probably as a replacement.

INTERPRETATION:

The sample is a granitic gneiss, produced by medium to high grade regional metamorphism, probably of an igneous precursor. A strong dynamic phase subsequently deformed the rock forming parallel zones of intense deformation and recrystallisation, and alignment of the biotite flakes. Retrogressive alteration produced chlorite and ?leucoxene in the biotite and fine sericitic muscovite.

SAMPLE: 6029RS282

ROCK NAME: Quartzo-feldspathic biotite gneiss

HAND SPECIMEN:

The sample is grey, fine grained with occasional larger grains, or aggregates, and a strong, closely spaced foliation produced by concentrations of aligned flakes of biotite.

THIN SECTION: C60153

The rock is fine grained with a size range between 0.2 and 1.0 mm. The felsic minerals have a well developed granoblastic texture with an elongation, particularly of quartz grains, parallel to a foliation defined by strongly aligned flakes of biotite.

The main constituents of the section are plagioclase, quartz and biotite. K-feldspar was not detected, and this observation was confirmed by the negative response to staining of the rock slice with sodium cobaltinitrite. Accessory zircon and apatite, with minor secondary opaques make up the remainder of the rock.

Plagioclase occurs as anhedral and mainly equant grains, interlocked with quartz. Albite twinning is only weakly developed and many crystals contain small rounded grains of quartz with an almost identical refractive index. The plagioclase composition is therefore that of andesine. Incipient clouding by very fine grained phyllosilicates has occurred.

Quartz grains are sometimes elongate and are frequently recrystallised into several smaller sized grains. Strain extinction is very weak.

Biotite occurs as elongate flakes, sometimes longer than 1.0 mm. The flakes have a strong parallel orientation and tend to segregate into distinct mineralogical layers. Minor quantities of fine opaques form strings parallel to the cleavage and only rare chloritic replacement of biotite has occurred.

Zircon and apatite are associated with the biotite layers. Zircon is usually rounded, cracked and turbid.

INTERPRETATION:

This rock appears to be in mineralogical equilibrium and has been unmodified since its crystallisation during medium to high grade regional metamorphism. A strong foliation was produced during metamorphism.

The sample differs from the gneisses described previously both in its mineralogy (absence of K-feldspar) and the lack of deformation and recrystallisation subsequent to metamorphism.

SAMPLE: 6029RS285

ROCK NAME: Deformed granitic gneiss

HAND SPECIMEN:

The rock is pale grey, fine grained and crystalline, composed of quartz, white feldspar, biotite and muscovite. A weak foliation is produced by alignment of the mica flakes.

THIN SECTION: C60154

The section is made from 3 rock chips. The rock is of fine to medium grain size, mainly within the range 0.3 to 3 or 4 mm. It is deformed and partly recrystallised and mica (mainly biotite) flakes are concentrated in zones of strongest deformation where the flakes have a parallel orientation.

The rock is composed mainly of K-feldspar, plagioclase, quartz and biotite. Muscovite, zircon and apatite are present in very minor proportions.

K-feldspar forms the largest crystals in the section and has been the most resistant to deformation. It forms perthitic crystals with microcline twinning and occasional mechanical breakdown into smaller grains. Inclusions of plagioclase and rounded blebs of quartz are common.

Plagioclase is finer grained and more equidimensional. Twin lamellae are sometimes curved by deformation. There is a moderate to strong clouding by fine sericite, which forms flakes up to 0.02 mm in length. This occurs also in the plagioclase inclusions in microcline, but in these cases, there is a narrow rim of clear plagioclase around the clouded grain suggesting a transfer of sodic plagioclase from the perthitic microcline. There are some intergrowth textures with quartz and the similar refractive indices of these two minerals indicates that the plagioclase is andesine.

Quartz occurs in large (3 to 4 mm) patches but is strongly deformed and recrystallised. Very fine (less than 0.05 mm) grained mosaics with sutured margins are common.

The strongest deformation and recrystallisation has occurred in the biotite-rich zones where quartz is elongated and even K-feldspar has recrystallised. Biotite flakes, 1 mm or more in length, are common and most have curved cleavage planes. Flakes of muscovite are intergrown and are concordant with the foliation. Much of the muscovite appears to be replacing biotite and the larger flakes also have curved cleavage planes so the formation of this mineral may be approximately synchronous with or slightly later than the deformation.

Strings of fine opaques are present in most of the biotite flakes and zircon inclusions are usually heavily iron stained.

INTERPRETATION:

This rock is a granitic gneiss, produced by medium to high grade regional metamorphism, probably of an igneous precursor, that has undergone subsequent dynamic metamorphism. This has produced partial recrystallisation of quartz and segregation of biotite along zones of strongest deformation. Replacement of biotite by muscovite possibly accompanied and continued after this period of deformation.

SAMPLE: 6029RS289

ROCK NAME: Sandy clay

HAND SPECIMEN:

The sample is pale grey, soft and clay-like with abundant, small quartz grains.

THIN SECTION: C60155

This sample is described on the Application form as regolith and there are textural features that are suggestive of a primary crystalline rock rather than a depositional one.

The section contains quartz grains or clasts, up to 1 mm in size. They are angular and equant to elongate and have strain extinction. Some clasts are polycrystalline. The only other "primary" mineral present is zircon, which is usually heavily iron strained.

These minerals are enclosed in a brown matrix composed of fine grained, weakly anisotropic ?clay minerals. Within the matrix are forms that suggest degraded biotite flakes. They are short and elongate, usually less than 0.1 mm, and have fine parallel opaque lines that may indicate a former cleavage. These forms are abundant and occur with a swirling texture around the quartz clasts.

Other relict outlines are more equant and in parts of the section are replaced by platelets of sericitic muscovite.

INTERPRETATION:

The sample appears to be a very altered rock, consistent with being part of a weathered surface. Primary ?gneissic textures remain but are chaotic and not persistent. This may be expected in a rock in which weathering processes have caused a reduction in volume, with subsequent collapse of the remaining material. The quartz clasts are supported by the matrix and thus may indicate a degree of transport which would also explain the chaotic nature of the interclastic texture. It is not clear how much of the phyllosilicate material is degraded primary minerals and how much has formed by pro-grade recrystallisation.

SAMPLE: 6029RS294

ROCK NAME: Sandy clay

HAND SPECIMEN:

The sample is composed of soft, pale cream to grey clay with numerous small grains of quartz.

THIN SECTION: C60156

The sample is described on the Application form as regolith, and retains more features than could be seen in the preceding sample (6029RS289).

Angular and equant to elongate quartz grains up to 1.5 mm in size are set in a matrix that is dominantly clay. The quartz has strong strain extinction and some particles are composites of smaller grains.

Remnants of feldspar are also present, with a tabular outline and rare indications of ?twinning. These grains are composed of fine grained feathery minerals that are weakly anisotropic.

Some clusters with micaceous forms are also present. These are mostly iron stained and ?chloritic, but occasional small flakes of muscovite are also present.

Small zircon granules with broad ferruginous rims are present.

Elsewhere in the matrix, no clear crystal form is preserved. This material is composed of structureless, weakly anisotropic clay – possibly kaolinite.

INTERPRETATION:

This sample has retained several of its primary features in spite of the severity of the alteration and collapse of many textures. The appearance is consistent with that of a deeply weathered granitoid rock.

APPENDIX E

GEOCHEMICAL ANALYSES

ANALYTICAL SERVICES

Amdel Laboratories Limited
Brown Street, Thebarton, 5031
Telephone: (08) 416 5300   Facsimile: (08) 234 0321

Mr Neil Gray
S.A. Dept of Mines & Energy
PO Box 151
EASTWOOD
SA 5063

FINAL ANALYSIS REPORT

Your Order No: EX 1353   Our Job Number : 3AD2104

Samples received : 15-JUN-1993   Results reported : 06-JUL-1993
No. of samples : 68
Report comprises a cover sheet and pages 1 to 18

This report relates specifically to the samples tested in so far as that the samples as supplied are truly representative of the sample source.

Please note:- 'RS261 RC33' was listed but not received.
:- 'RS279' was received but not listed.

Note:
If you have any enquiries please contact Miss Anne Reed quoting the above job number.

Approved Signatory:

John Waters
Laboratory Manager - Adelaide

MM	Mr Neil Gray	SA
CC	Mr Neil Gray	SA

Report Codes:
N.A. - Not Analysed.
L.N.R. - Listed But Not Received.
I.S. - Insuffecent Sample.

Distribution Codes:
CC - Carbon Copy
EM - Electronic Media
MM - Magnetic Media

amdel

Job: 3AD2104
O/N: EX 1353

ANALYTICAL REPORT

		Sample 6029RS 226	Sample 6029RS 230	Sample 6029RS 232	Sample 6029RS 234	DL	Method
SiO2	%	71.9	59.3	73.1	72.7	0.01	IC4
TiO2	%	0.14	0.84	0.22	0.12	0.01	IC4
Al2O3	%	14.1	17.9	13.9	13.6	0.01	IC4
Fe2O3	%	1.81	5.25	1.48	1.10	0.01	IC4
MnO	%	0.01	0.03	<0.01	0.02	0.01	IC4
MgO	%	0.20	5.10	0.36	0.22	0.01	IC4
CaO	%	0.83	0.35	0.88	0.58	0.01	IC4
Na2O	%	3.12	7.60	3.42	3.22	0.01	IC4
K2O	%	5.70	0.46	5.00	5.95	0.01	IC4
P2O5	%	0.07	0.12	0.06	0.05	0.01	IC4
LOI	%	1.29	3.02	0.86	0.36	0.01	IC4
Ag	ppm	<1	<1	<1	<1	1.0	IC3E
As	ppm	5	<3	5	<3	3.0	IC3E
Au	ppb	<1	<1	<1	<1	1.0	FA3
Ba	ppm	560	20	700	450	10.0	XRF1
Bi	ppm	<5	<5	<5	<5	5.0	IC3E
Ca	%	0.342	0.145	0.398	0.115	0.001	IC3E
Cd	ppm	<2	<2	<2	<2	2.0	IC3E
Ce	ppm	60	125	95	15	10.0	IC3E
Co	ppm	6	10	3	400	2.0	IC3E
Cr	ppm	6	11	8	6	2.0	IC3E
Cs	ppm	<10	<10	<10	10	10.0	XRF1
Cu	ppm	7	3	5	4	2.0	IC3E
Fe	%	0.85	2.88	0.69	0.55	0.01	IC3E
K	%	2.34	0.324	2.48	2.48	0.001	IC3E
La	ppm	20	30	30	10	5.0	IC3E
Mg	%	0.085	2.26	0.188	0.092	0.001	IC3E
Mn	ppm	70	145	40	65	5.0	IC3E
Mo	ppm	<2	<2	<2	2	2.0	IC3E
Na	%	2.10	4.84	2.44	2.30	0.001	IC3E
Nb	ppm	2	26	2	5	2.0	XRF1
Ni	ppm	12	22	6	4	2.0	IC3E
P	ppm	300	520	270	195	5.0	IC3E
Pb	ppm	40	5	35	35	5.0	IC3E
Pd	ppb	<1	<1	<1	<1	1.0	FA3
Pt	ppb	<5	<5	<5	<5	5.0	FA3
Rb	ppm	200	15	120	210	2.0	XRF1
Sb	ppm	6	<4	<4	4	4.0	XRF1
Sn	ppm	5	15	5	5	5.0	IC3E
Sr	ppm	44	34	82	24	2.0	IC3E
Th	ppm	22	35	25	18	4.0	XRF1
Ti	ppm	850	1720	1320	670	10.0	IC3E
U	ppm	6	<4	<4	<4	4.0	XRF1
V	ppm	11	32	17	8	2.0	IC3E
Y	ppm	5	5	6	2	2.0	IC3E
Zn	ppm	22	30	46	20	2.0	IC3E
Zr	ppm	75	60	95	55	5.0	IC3E

amdel

Job: 3AD2104
O/N: EX 1353

ANALYTICAL REPORT

		Sample 6029RS 238	Sample 6029RS 241	Sample 6029RS 243	Sample 6029RS 246	DL	Method
SiO2	%	71.7	68.9	65.7	56.4	0.01	IC4
TiO2	%	0.12	0.15	0.45	0.92	0.01	IC4
Al2O3	%	14.0	14.5	15.2	18.1	0.01	IC4
Fe2O3	%	1.30	2.58	4.78	7.40	0.01	IC4
MnO	%	0.01	0.02	0.07	0.10	0.01	IC4
MgO	%	0.27	0.30	2.16	3.56	0.01	IC4
CaO	%	0.77	0.50	3.26	6.60	0.01	IC4
Na2O	%	3.18	3.22	2.92	3.64	0.01	IC4
K2O	%	6.20	6.90	4.56	2.00	0.01	IC4
P2O5	%	0.06	0.08	0.17	0.26	0.01	IC4
LOI	%	0.63	0.83	0.69	0.55	0.01	IC4
Ag	ppm	<1	7	<1	1	1.0	IC3E
As	ppm	<3	11	<3	8	3.0	IC3E
Au	ppb	<1	3	<1	1	1.0	FA3
Ba	ppm	440	290	730	460	10.0	XRF1
Bi	ppm	<5	5	<5	<5	5.0	IC3E
Ca	%	0.348	0.206	1.18	3.90	0.001	IC3E
Cd	ppm	<2	<2	<2	<2	2.0	IC3E
Ce	ppm	55	110	90	105	10.0	IC3E
Co	ppm	4	1060	12	24	2.0	IC3E
Cr	ppm	4	22	38	46	2.0	IC3E
Cs	ppm	<10	<10	<10	<10	10.0	XRF1
Cu	ppm	4	13	13	35	2.0	IC3E
Fe	%	0.60	1.28	1.90	4.32	0.01	IC3E
K	%	2.54	2.54	2.22	1.49	0.001	IC3E
La	ppm	20	35	25	25	5.0	IC3E
Mg	%	0.125	0.145	0.785	1.64	0.001	IC3E
Mn	ppm	70	85	320	670	5.0	IC3E
Mo	ppm	<2	4	<2	5	2.0	IC3E
Na	%	2.28	2.24	1.42	2.40	0.001	IC3E
Nb	ppm	8	9	8	11	2.0	XRF1
Ni	ppm	4	72	12	17	2.0	IC3E
P	ppm	280	290	510	1080	5.0	IC3E
Pb	ppm	40	50	20	20	5.0	IC3E
Pd	ppb	<1	<1	<1	<1	1.0	FA3
Pt	ppb	<5	<5	<5	<5	5.0	FA3
Rb	ppm	250	260	155	105	2.0	XRF1
Sb	ppm	<4	4	10	<4	4.0	XRF1
Sn	ppm	10	10	15	15	5.0	IC3E
Sr	ppm	40	30	185	310	2.0	IC3E
Th	ppm	25	52	22	<4	4.0	XRF1
Ti	ppm	700	850	1920	5500	10.0	IC3E
U	ppm	5	12	6	<4	4.0	XRF1
V	ppm	9	10	60	175	2.0	IC3E
Y	ppm	10	12	9	15	2.0	IC3E
Zn	ppm	22	35	42	98	2.0	IC3E
Zr	ppm	75	75	55	70	5.0	IC3E

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		Sample 6029RS 248	Sample 6029RS 250	Sample 6029RS 253	Sample 6029RS 255	DL	Method
SiO2	%	73.6	63.1	66.2	85.2	0.01	IC4
TiO2	%	0.10	0.56	0.47	0.09	0.01	IC4
Al2O3	%	12.7	16.3	14.1	6.75	0.01	IC4
Fe2O3	%	1.41	3.90	5.70	1.36	0.01	IC4
MnO	%	<0.01	0.06	0.18	<0.01	0.01	IC4
MgO	%	0.20	2.18	1.42	0.15	0.01	IC4
CaO	%	0.26	2.50	3.16	0.49	0.01	IC4
Na2O	%	1.80	3.44	3.26	1.27	0.01	IC4
K2O	%	7.65	3.72	2.10	3.06	0.01	IC4
P2O5	%	0.06	0.05	0.13	<0.01	0.01	IC4
LOI	%	1.50	1.37	2.56	0.50	0.01	IC4
Ag	ppm	<1	<1	1	<1	1.0	IC3E
As	ppm	<3	4	<3	3	3.0	IC3E
Au	ppb	<1	<1	<1	<1	1.0	FA3
Ba	ppm	700	650	590	260	10.0	XRF1
Bi	ppm	<5	<5	<5	<5	5.0	IC3E
Ca	%	0.040	0.985	1.43	0.242	0.001	IC3E
Cd	ppm	<2	3	<2	<2	2.0	IC3E
Ce	ppm	35	85	85	75	10.0	IC3E
Co	ppm	<2	17	13	15	2.0	IC3E
Cr	ppm	6	32	30	5	2.0	IC3E
Cs	ppm	<10	<10	<10	<10	10.0	XRF1
Cu	ppm	3	3	9	5	2.0	IC3E
Fe	%	0.72	1.92	3.02	0.77	0.01	IC3E
K	%	2.44	2.22	1.43	1.83	0.001	IC3E
La	ppm	15	30	20	30	5.0	IC3E
Mg	%	0.087	0.860	0.565	0.085	0.001	IC3E
Mn	ppm	40	310	1120	45	5.0	IC3E
Mo	ppm	<2	<2	3	<2	2.0	IC3E
Na	%	1.30	2.22	2.14	0.915	0.001	IC3E
Nb	ppm	5	9	6	<2	2.0	XRF1
Ni	ppm	4	15	10	7	2.0	IC3E
P	ppm	300	250	580	105	5.0	IC3E
Pb	ppm	55	20	15	15	5.0	IC3E
Pd	ppb	<1	<1	<1	<1	1.0	FA3
Pt	ppb	<5	<5	<5	<5	5.0	FA3
Rb	ppm	300	160	84	80	2.0	XRF1
Sb	ppm	4	<4	4	<4	4.0	XRF1
Sn	ppm	15	10	15	10	5.0	IC3E
Sr	ppm	19	185	195	28	2.0	IC3E
Th	ppm	30	18	<4	24	4.0	XRF1
Ti	ppm	600	3350	2900	600	10.0	IC3E
U	ppm	4	8	<4	<4	4.0	XRF1
V	ppm	6	68	88	12	2.0	IC3E
Y	ppm	2	6	12	5	2.0	IC3E
Zn	ppm	22	54	62	19	2.0	IC3E
Zr	ppm	60	105	40	45	5.0	IC3E

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ANALYTICAL REPORT

		Sample 6029RS 257	Sample 6029RS 259	Sample 6029RS 261	Sample 6029RS 263	DL	Method
SiO2	%	75.4	73.1	70.3	83.0	0.01	IC4
TiO2	%	0.07	0.07	0.05	0.85	0.01	IC4
Al2O3	%	11.8	13.1	12.8	7.25	0.01	IC4
Fe2O3	%	1.65	0.76	2.34	2.02	0.01	IC4
MnO	%	<0.01	<0.01	<0.01	0.03	0.01	IC4
MgO	%	0.06	0.09	0.05	0.27	0.01	IC4
CaO	%	0.24	0.18	0.24	0.85	0.01	IC4
Na2O	%	1.75	1.61	2.06	0.93	0.01	IC4
K2O	%	6.95	7.75	7.55	1.72	0.01	IC4
P2O5	%	0.06	0.05	0.06	0.08	0.01	IC4
LOI	%	0.91	1.25	3.00	2.10	0.01	IC4
Ag	ppm	<1	<1	<1	1	1.0	IC3E
As	ppm	4	4	8	<3	3.0	IC3E
Au	ppb	<1	<1	1	<1	1.0	FA3
Ba	ppm	310	540	430	180	10.0	XRF1
Bi	ppm	<5	<5	<5	<5	5.0	IC3E
Ca	%	0.031	0.027	0.027	0.123	0.001	IC3E
Cd	ppm	<2	<2	<2	<2	2.0	IC3E
Ce	ppm	105	75	30	50	10.0	IC3E
Co	ppm	7	3	4	10	2.0	IC3E
Cr	ppm	2	5	8	11	2.0	IC3E
Cs	ppm	<10	<10	<10	<10	10.0	XRF1
Cu	ppm	2	<2	3	16	2.0	IC3E
Fe	%	0.79	0.36	1.07	1.04	0.01	IC3E
K	%	2.20	2.12	2.52	1.08	0.001	IC3E
La	ppm	30	25	20	5	5.0	IC3E
Mg	%	0.024	0.053	0.024	0.137	0.001	IC3E
Mn	ppm	25	20	20	195	5.0	IC3E
Mo	ppm	<2	<2	<2	<2	2.0	IC3E
Na	%	1.20	1.14	1.45	0.600	0.001	IC3E
Nb	ppm	6	4	<2	5	2.0	XRF1
Ni	ppm	14	5	24	7	2.0	IC3E
P	ppm	290	250	290	390	5.0	IC3E
Pb	ppm	55	55	50	15	5.0	IC3E
Pd	ppb	<1	<1	<1	<1	1.0	FA3
Pt	ppb	<5	<5	<5	<5	5.0	FA3
Rb	ppm	250	280	260	72	2.0	XRF1
Sb	ppm	<4	<4	4	<4	4.0	XRF1
Sn	ppm	10	10	10	10	5.0	IC3E
Sr	ppm	22	13	40	13	2.0	IC3E
Th	ppm	82	26	22	6	4.0	XRF1
Ti	ppm	420	440	250	4600	10.0	IC3E
U	ppm	4	5	5	<4	4.0	XRF1
V	ppm	6	4	11	125	2.0	IC3E
Y	ppm	10	4	4	3	2.0	IC3E
Zn	ppm	26	24	17	64	2.0	IC3E
Zr	ppm	140	75	45	45	5.0	IC3E

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ANALYTICAL REPORT

		Sample 6029RS 265	Sample 6029RS 268	Sample 6029RS 276	Sample 6029RS 282	DL	Method
SiO2	%	74.7	81.2	63.6	60.4	0.01	IC4
TiO2	%	0.09	0.28	0.53	1.68	0.01	IC4
Al2O3	%	12.9	7.40	15.3	15.8	0.01	IC4
Fe2O3	%	1.22	2.80	4.20	7.70	0.01	IC4
MnO	%	<0.01	0.02	0.04	0.05	0.01	IC4
MgO	%	0.01	0.52	1.66	2.84	0.01	IC4
CaO	%	0.81	0.46	1.06	2.08	0.01	IC4
Na2O	%	2.70	1.18	3.16	2.58	0.01	IC4
K2O	%	5.30	2.56	6.10	2.74	0.01	IC4
P2O5	%	0.07	0.02	0.31	0.17	0.01	IC4
LOI	%	1.21	1.69	1.96	3.02	0.01	IC4
Ag	ppm	<1	<1	<1	1	1.0	IC3E
As	ppm	<3	5	<3	<3	3.0	IC3E
Au	ppb	<1	2	<1	1	1.0	FA3
Ba	ppm	460	390	2950	440	10.0	XRF1
Bi	ppm	<5	<5	<5	<5	5.0	IC3E
Ca	%	0.097	0.120	0.424	0.685	0.001	IC3E
Cd	ppm	<2	<2	<2	<2	2.0	IC3E
Ce	ppm	<10	45	120	70	10.0	IC3E
Co	ppm	<2	14	13	54	2.0	IC3E
Cr	ppm	3	20	135	68	2.0	IC3E
Cs	ppm	<10	<10	<10	<10	10.0	XRF1
Cu	ppm	4	24	20	40	2.0	IC3E
Fe	%	0.60	1.48	2.18	4.48	0.01	IC3E
K	%	2.42	1.70	2.18	2.06	0.001	IC3E
La	ppm	5	10	40	20	5.0	IC3E
Mg	%	0.006	0.280	0.960	1.53	0.001	IC3E
Mn	ppm	20	140	230	320	5.0	IC3E
Mo	ppm	<2	2	2	2	2.0	IC3E
Na	%	1.89	0.815	2.20	1.78	0.001	IC3E
Nb	ppm	6	6	10	25	2.0	XRF1
Ni	ppm	4	20	52	48	2.0	IC3E
P	ppm	300	170	1320	790	5.0	IC3E
Pb	ppm	35	25	45	25	5.0	IC3E
Pd	ppb	<1	<1	<1	<1	1.0	FA3
Pt	ppb	<5	<5	<5	<5	5.0	FA3
Rb	ppm	210	80	220	175	2.0	XRF1
Sb	ppm	<4	<4	<4	<4	4.0	XRF1
Sn	ppm	10	5	15	15	5.0	IC3E
Sr	ppm	28	30	510	54	2.0	IC3E
Th	ppm	10	14	44	24	4.0	XRF1
Ti	ppm	530	1680	3200	10800	10.0	IC3E
U	ppm	8	4	8	5	4.0	XRF1
V	ppm	4	24	64	230	2.0	IC3E
Y	ppm	<2	4	7	12	2.0	IC3E
Zn	ppm	7	34	54	360	2.0	IC3E
Zr	ppm	45	100	120	180	5.0	IC3E

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ANALYTICAL REPORT

		Sample 6029RS 285	Sample 6029RS 279	DL	Method
SiO2	%	72.3	70.3	0.01	IC4
TiO2	%	0.26	0.45	0.01	IC4
Al2O3	%	14.1	13.3	0.01	IC4
Fe2O3	%	1.60	3.74	0.01	IC4
MnO	%	0.01	0.04	0.01	IC4
MgO	%	0.49	0.92	0.01	IC4
CaO	%	0.53	0.86	0.01	IC4
Na2O	%	2.68	3.40	0.01	IC4
K2O	%	6.25	4.92	0.01	IC4
P2O5	%	0.13	0.13	0.01	IC4
LOI	%	0.85	0.63	0.01	IC4
Ag	ppm	<1	<1	1.0	IC3E
As	ppm	<3	<3	3.0	IC3E
Au	ppb	<1	10	1.0	FA3
Ba	ppm	510	660	10.0	XRF1
Bi	ppm	<5	<5	5.0	IC3E
Ca	%	0.186	0.234	0.001	IC3E
Cd	ppm	<2	<2	2.0	IC3E
Ce	ppm	45	30	10.0	IC3E
Co	ppm	4	7	2.0	IC3E
Cr	ppm	13	9	2.0	IC3E
Cs	ppm	<10	<10	10.0	XRF1
Cu	ppm	2	5	2.0	IC3E
Fe	%	0.82	1.88	0.01	IC3E
K	%	2.24	1.50	0.001	IC3E
La	ppm	15	25	5.0	IC3E
Mg	%	0.260	0.498	0.001	IC3E
Mn	ppm	80	230	5.0	IC3E
Mo	ppm	<2	<2	2.0	IC3E
Na	%	1.89	2.16	0.001	IC3E
Nb	ppm	9	18	2.0	XRF1
Ni	ppm	6	4	2.0	IC3E
P	ppm	560	520	5.0	IC3E
Pb	ppm	35	35	5.0	IC3E
Pd	ppb	<1	<1	1.0	FA3
Pt	ppb	<5	<5	5.0	FA3
Rb	ppm	190	155	2.0	XRF1
Sb	ppm	<4	<4	4.0	XRF1
Sn	ppm	10	5	5.0	IC3E
Sr	ppm	64	42	2.0	IC3E
Th	ppm	34	10	4.0	XRF1
Ti	ppm	1600	2700	10.0	IC3E
U	ppm	5	<4	4.0	XRF1
V	ppm	22	18	2.0	IC3E
Y	ppm	5	13	2.0	IC3E
Zn	ppm	40	54	2.0	IC3E
Zr	ppm	95	145	5.0	IC3E

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ANALYTICAL REPORT

		Sample 6029RS 289	Sample 6029RS 295	Sample 6029RS 294	Sample 6029RS 269	DL	Method
Ag	ppm	<1	<1	<1	<1	1.0	IC3E
As	ppm	<3	<3	<3	<3	3.0	IC3E
Au	ppb	<1	<1	<1	<1	1.0	FA3
Co	ppm	4	6	<2	3	2.0	IC3E
Cr	ppm	68	10	4	5	2.0	IC3E
Cu	ppm	19	9	3	40	2.0	IC3E
Fe	%	3.82	1.80	0.31	1.94	0.01	IC3E
Mn	ppm	100	145	20	195	5.0	IC3E
Mo	ppm	<2	<2	<2	<2	2.0	IC3E
Ni	ppm	17	12	3	4	2.0	IC3E
Pb	ppm	20	20	75	30	5.0	IC3E
Pd	ppb	<1	<1	<1	<1	1.0	FA3
Pt	ppb	<5	<5	<5	<5	5.0	FA3
Zn	ppm	40	76	12	52	2.0	IC3E

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ANALYTICAL REPORT

		Sample 6029RS 290	Sample 6029RS 292	Sample 6029RS 291	Sample 6029RS 293	DL	Method
Ag	ppm	<1	<1	<1	<1	1.0	IC3E
As	ppm	<3	<3	<3	<3	3.0	IC3E
Au	ppb	<1	<1	<1	<1	1.0	FA3
Co	ppm	11	7	6	25	2.0	IC3E
Cr	ppm	3	9	9	7	2.0	IC3E
Cu	ppm	2	4	3	4	2.0	IC3E
Fe	%	0.51	0.47	0.52	0.72	0.01	IC3E
Mn	ppm	15	25	25	45	5.0	IC3E
Mo	ppm	<2	<2	<2	<2	2.0	IC3E
Ni	ppm	5	7	7	22	2.0	IC3E
Pb	ppm	30	30	40	35	5.0	IC3E
Pd	ppb	<1	<1	<1	<1	1.0	FA3
Pt	ppb	<5	<5	<5	<5	5.0	FA3
Zn	ppm	22	38	24	46	2.0	IC3E

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ANALYTICAL REPORT

		Sample 6029RS 283	Sample 6029RS 287	Sample 6029RS 288	Sample 6029RS 286	DL	Method
Ag	ppm	1	1	<1	<1	1.0	IC3E
As	ppm	<3	<3	<3	3	3.0	IC3E
Au	ppb	<1	3	<1	1	1.0	FA3
Co	ppm	<2	7	6	17	2.0	IC3E
Cr	ppm	140	94	74	48	2.0	IC3E
Cu	ppm	10	26	20	26	2.0	IC3E
Fe	%	0.63	1.70	3.20	1.49	0.01	IC3E
Mn	ppm	25	125	100	40	5.0	IC3E
Mo	ppm	<2	<2	<2	<2	2.0	IC3E
Ni	ppm	12	19	20	36	2.0	IC3E
Pb	ppm	60	20	20	15	5.0	IC3E
Pd	ppb	<1	<1	<1	<1	1.0	FA3
Pt	ppb	<5	<5	<5	<5	5.0	FA3
Zn	ppm	18	54	115	88	2.0	IC3E

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ANALYTICAL REPORT

		Sample 6029RS 284	Sample 6029RS 274	Sample 6029RS 270	Sample 6029RS 273	DL	Method
Ag	ppm	<1	<1	<1	<1	1.0	IC3E
As	ppm	<3	<3	6	4	3.0	IC3E
Au	ppb	<1	<1	1	<1	1.0	FA3
Co	ppm	19	14	12	19	2.0	IC3E
Cr	ppm	105	190	76	170	2.0	IC3E
Cu	ppm	9	32	17	26	2.0	IC3E
Fe	%	1.10	3.38	1.44	0.82	0.01	IC3E
Mn	ppm	85	240	65	35	5.0	IC3E
Mo	ppm	<2	2	2	<2	2.0	IC3E
Ni	ppm	55	80	17	48	2.0	IC3E
Pb	ppm	30	70	35	60	5.0	IC3E
Pd	ppb	<1	<1	<1	<1	1.0	FA3
Pt	ppb	<5	<5	<5	<5	5.0	FA3
Zn	ppm	54	110	55	52	2.0	IC3E

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ANALYTICAL REPORT

		Sample 6029RS 271	Sample 6029RS 275	Sample 6029RS 277	Sample 6029RS 278	DL	Method
Ag	ppm	<1	1	<1	<1	1.0	IC3E
As	ppm	<3	<3	6	<3	3.0	IC3E
Au	ppb	<1	<1	<1	<1	1.0	FA3
Co	ppm	3	13	11	9	2.0	IC3E
Cr	ppm	6	150	12	15	2.0	IC3E
Cu	ppm	9	22	34	24	2.0	IC3E
Fe	%	1.94	2.88	0.96	1.39	0.01	IC3E
Mn	ppm	70	190	90	70	5.0	IC3E
Mo	ppm	<2	<2	4	<2	2.0	IC3E
Ni	ppm	4	55	24	9	2.0	IC3E
Pb	ppm	30	60	180	35	5.0	IC3E
Pd	ppb	<1	<1	<1	<1	1.0	FA3
Pt	ppb	<5	<5	<5	<5	5.0	FA3
Zn	ppm	24	76	44	76	2.0	IC3E

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ANALYTICAL REPORT

		Sample	Sample	Sample	Sample	DL	Method
		6029RS 280	6029RS 281	6029RS 266	6029RS 264		
Ag	ppm	<1	<1	<1	<1	1.0	IC3E
As	ppm	<3	<3	7	4	3.0	IC3E
Au	ppb	<1	<1	2	1	1.0	FA3
Co	ppm	3	48	2	<2	2.0	IC3E
Cr	ppm	10	165	10	6	2.0	IC3E
Cu	ppm	8	38	5	4	2.0	IC3E
Fe	%	0.24	4.20	0.84	0.27	0.01	IC3E
Mn	ppm	20	400	40	15	5.0	IC3E
Mo	ppm	3	3	<2	<2	2.0	IC3E
Ni	ppm	7	65	8	<2	2.0	IC3E
Pb	ppm	55	20	20	25	5.0	IC3E
Pd	ppb	<1	<1	<1	<1	1.0	FA3
Pt	ppb	<5	<5	<5	<5	5.0	FA3
Zn	ppm	34	200	18	5	2.0	IC3E

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ANALYTICAL REPORT

		Sample 6029RS 267	Sample 6029RS 242	Sample 6029RS 240	Sample 6029RS 235	DL	Method
Ag	ppm	<1	<1	1	<1	1.0	IC3E
As	ppm	3	<3	<3	<3	3.0	IC3E
Au	ppb	1	<1	<1	<1	1.0	FA3
Co	ppm	4	22	17	<2	2.0	IC3E
Cr	ppm	15	98	120	9	2.0	IC3E
Cu	ppm	12	32	8	2	2.0	IC3E
Fe	%	1.18	3.94	2.06	0.37	0.01	IC3E
Mn	ppm	60	190	220	25	5.0	IC3E
Mo	ppm	<2	<2	2	<2	2.0	IC3E
Ni	ppm	10	30	38	5	2.0	IC3E
Pb	ppm	15	15	30	40	5.0	IC3E
Pd	ppb	<1	<1	<1	<1	1.0	FA3
Pt	ppb	<5	<5	<5	<5	5.0	FA3
Zn	ppm	32	100	90	20	2.0	IC3E

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ANALYTICAL REPORT

		Sample 6029RS 228	Sample 6029RS 227	Sample 6029RS 236	Sample 6029RS 237	DL	Method
Ag	ppm	<1	<1	1	1	1.0	IC3E
As	ppm	3	<3	3	<3	3.0	IC3E
Au	ppb	<1	<1	<1	<1	1.0	FA3
Co	ppm	8	10	2	17	2.0	IC3E
Cr	ppm	15	22	45	50	2.0	IC3E
Cu	ppm	3	19	40	42	2.0	IC3E
Fe	%	3.62	2.32	0.71	1.87	0.01	IC3E
Mn	ppm	90	230	50	155	5.0	IC3E
Mo	ppm	<2	<2	<2	<2	2.0	IC3E
Ni	ppm	9	7	17	22	2.0	IC3E
Pb	ppm	10	30	25	20	5.0	IC3E
Pd	ppb	<1	<1	<1	<1	1.0	FA3
Pt	ppb	<5	<5	<5	<5	5.0	FA3
Zn	ppm	410	120	290	96	2.0	IC3E

amdel

Job: 3AD2104
O/N: EX 1353

ANALYTICAL REPORT

		Sample 6029RS 229	Sample 6029RS 231	Sample 6029RS 251	Sample 6029RS 252	DL	Method
Ag	ppm	<1	<1	1	<1	1.0	IC3E
As	ppm	<3	<3	3	4	3.0	IC3E
Au	ppb	<1	<1	<1	<1	1.0	FA3
Co	ppm	<2	16	12	14	2.0	IC3E
Cr	ppm	4	50	38	35	2.0	IC3E
Cu	ppm	3	40	38	14	2.0	IC3E
Fe	%	0.55	3.26	4.30	3.44	0.01	IC3E
Mn	ppm	35	220	310	690	5.0	IC3E
Mo	ppm	<2	2	2	3	2.0	IC3E
Ni	ppm	4	40	12	13	2.0	IC3E
Pb	ppm	<5	35	25	20	5.0	IC3E
Pd	ppb	<1	<1	<1	<1	1.0	FA3
Pt	ppb	<5	<5	<5	<5	5.0	FA3
Zn	ppm	12	75	125	78	2.0	IC3E

amdel

Job: 3AD2104
O/N: EX 1353

ANALYTICAL REPORT

		Sample 6029RS 245	Sample 6029RS 239	Sample 6029RS 249	Sample 6029RS 247	DL	Method
Ag	ppm	1	<1	<1	<1	1.0	IC3E
As	ppm	4	10	6	4	3.0	IC3E
Au	ppb	<1	<1	<1	<1	1.0	FA3
Co	ppm	9	6	13	<2	2.0	IC3E
Cr	ppm	130	<2	34	3	2.0	IC3E
Cu	ppm	22	74	15	4	2.0	IC3E
Fe	%	3.28	3.72	1.02	0.43	0.01	IC3E
Mn	ppm	100	30	125	30	5.0	IC3E
Mo	ppm	<2	4	2	<2	2.0	IC3E
Ni	ppm	10	10	10	<2	2.0	IC3E
Pb	ppm	10	55	35	65	5.0	IC3E
Pd	ppb	<1	<1	<1	<1	1.0	FA3
Pt	ppb	<5	<5	<5	<5	5.0	FA3
Zn	ppm	42	13	26	19	2.0	IC3E

amdel

Job: 3AD2104
O/N: EX 1353

ANALYTICAL REPORT

		Sample 6029RS 254	Sample 6029RS 260	Sample 6029RS 258	Sample 6029RS 256	DL	Method
Ag	ppm	<1	<1	<1	<1	1.0	IC3E
As	ppm	<3	<3	<3	4	3.0	IC3E
Au	ppb	<1	<1	<1	<1	1.0	FA3
Co	ppm	8	4	2	3	2.0	IC3E
Cr	ppm	4	15	6	5	2.0	IC3E
Cu	ppm	9	7	5	10	2.0	IC3E
Fe	%	0.47	0.85	0.39	0.49	0.01	IC3E
Mn	ppm	40	55	30	20	5.0	IC3E
Mo	ppm	<2	<2	<2	<2	2.0	IC3E
Ni	ppm	5	15	3	10	2.0	IC3E
Pb	ppm	25	15	35	55	5.0	IC3E
Pd	ppb	<1	<1	<1	<1	1.0	FA3
Pt	ppb	<5	<5	<5	<5	5.0	FA3
Zn	ppm	34	34	20	40	2.0	IC3E

amdel

Job: 3AD2104
O/N: EX 1353

ANALYTICAL REPORT

		Sample 6029RS 262	Sample 6029RS 289B	DL	Method
Ag	ppm	<1	<1	1.0	IC3E
As	ppm	<3	<3	3.0	IC3E
Au	ppb	<1	12	1.0	FA3
Co	ppm	20	4	2.0	IC3E
Cr	ppm	18	48	2.0	IC3E
Cu	ppm	44	17	2.0	IC3E
Fe	%	1.42	6.95	0.01	IC3E
Mn	ppm	240	220	5.0	IC3E
Mo	ppm	<2	4	2.0	IC3E
Ni	ppm	16	13	2.0	IC3E
Pb	ppm	25	15	5.0	IC3E
Pd	ppb	<1	<1	1.0	FA3
Pt	ppb	<5	<5	5.0	FA3
Zn	ppm	88	32	2.0	IC3E

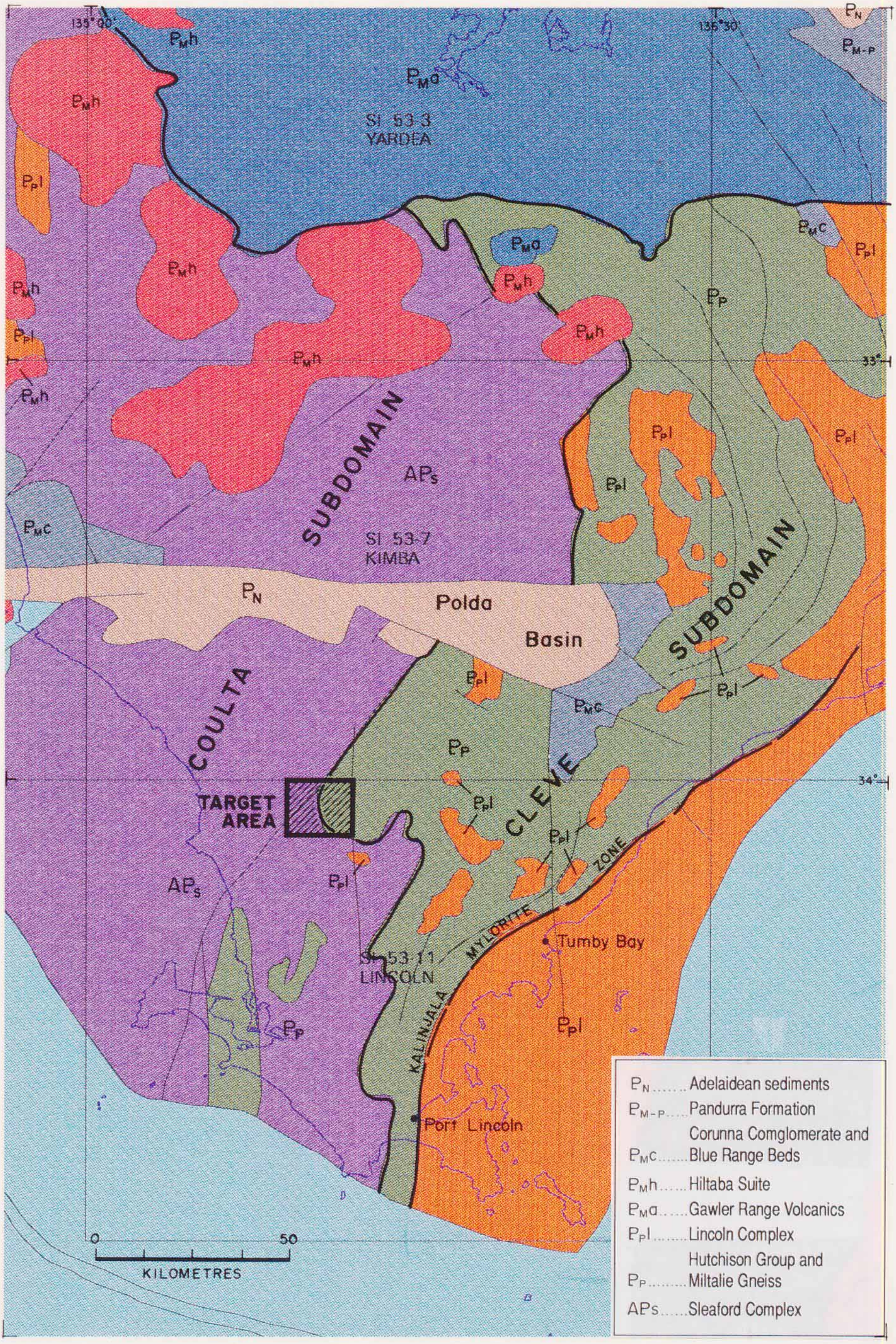

Figure 1 Tectonic map of southern Gawler Craton (adapted from Rankin, 1993) DME_SA 93-1593

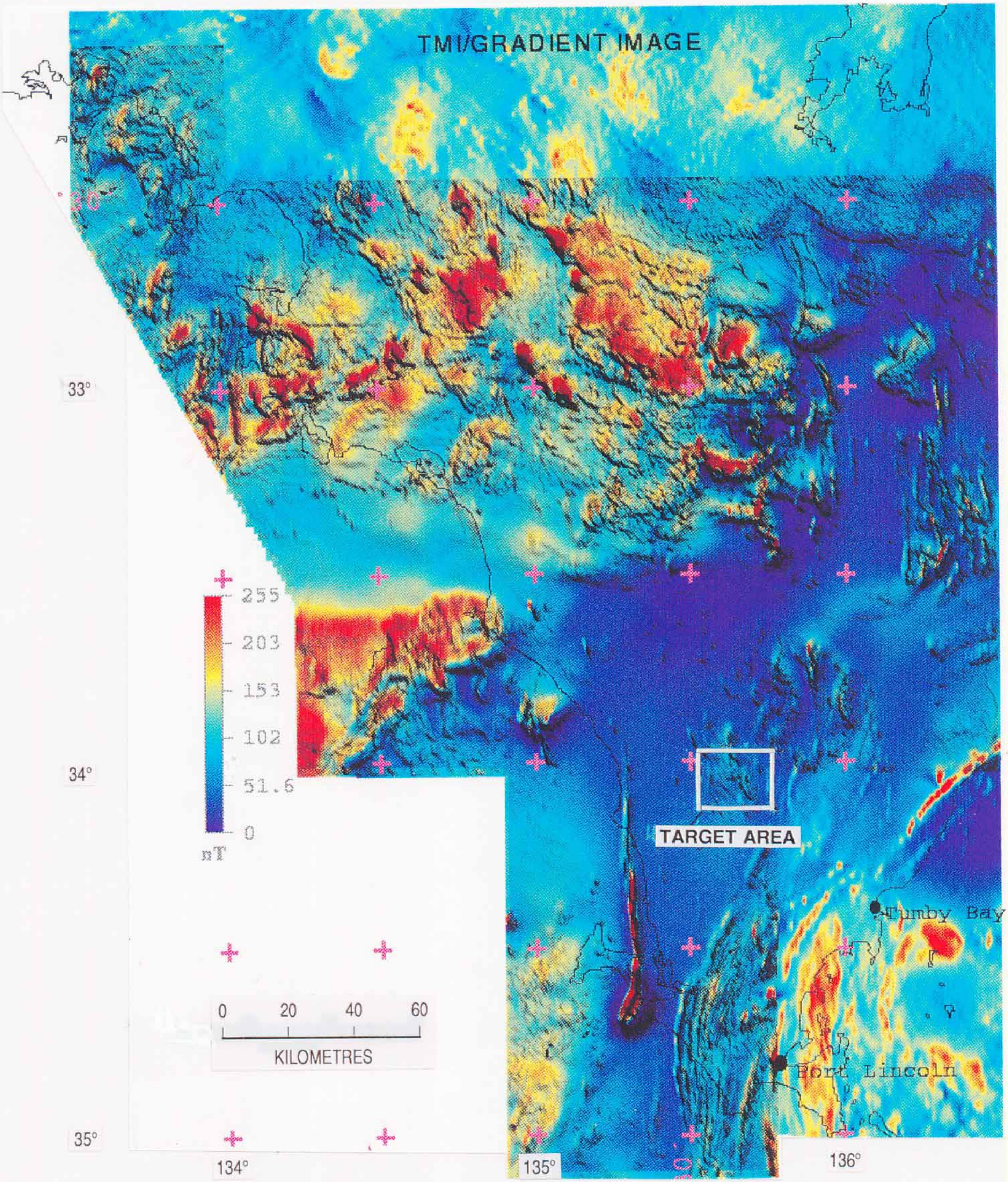

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Figure 2 Total Magnetic Intensity (TMI) image, southern Gawler Craton

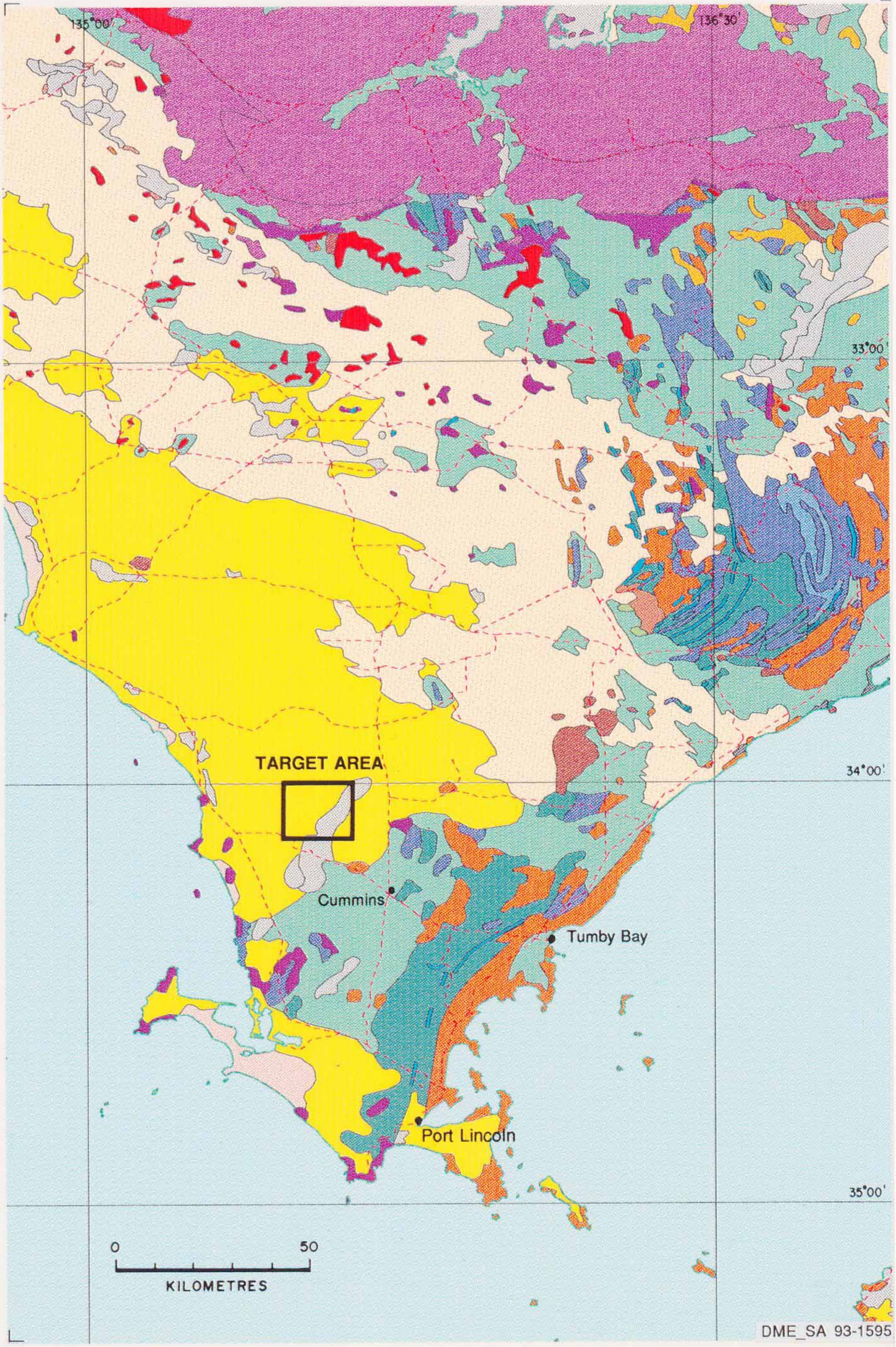

Figure 3a Surficial geology of Eyre Peninsula. Adapted from Cowley & Freeman (1993)

REFERENCE

CAINOZOIC

QUATERNARY

HOLOCENE

- Stream alluvium; COONAMBIDGAL FORMATION in Murray River Valley. Recent mound spring and other spring deposits.
- Lacustrine and aeolian sediments associated with playas and lakes; includes YAMBA FORMATION.
- White calcareous and siliceous dune sand.
- ST KILDA FORMATION: Calcareous, fossiliferous sand and mud of intertidal sand flats, beaches and tidal marshes; organic, gypseous clay of supratidal.
- Basaltic lavas and pyroclasts.
- FULHAM SAND: Orange siliceous aeolian sand.
- Aeolian sand of inland dune fields and associated fluviatile sediments; includes SIMPSON SAND, MOLINEAUX SAND.
- Shallow, red, sandy and clayey soil of the northwestern region.
- Gravelly and sandy clay of alluvial plains; includes POORAKA FORMATION, HINDMARSH CLAY and associated calcrete horizons. Gypsified gravels and surfaces in north of state.
- Fossil mound spring deposits.

PLEISTOCENE

- PADTHAWAY FORMATION: Silt, dolomite and sand of lagoons and swamps.
- Calcreted colluvium.
- BRIDGEWATER FORMATION: Calcreted aeolianite.
- BLANCHETOWN CLAY: Sandy clay. Overlain by BUNGUNNIA LIMESTONE: Lacustrine dolomitic limestone.
- COOMANDOOK FORMATION: Shallow marine, fossiliferous sandy limestone and calcareous sand.
- Limestone of the Alberrie Creek plateau.
- Ferruginous gravel and sand derived from dissected ferruginous duricrusts.
- Pliocene coastal ridges, Murray Basin; Eocene coastal ridges, Eucla Basin.

TERTIARY

PLIOCENE

- PARILLA SAND, LOXTON SANDS: Fluvio-lacustrine and estuarine, siliceous and clayey sand.

MIOCENE-PLIOCENE

- ETADUNNA FORMATION, NAMBA FORMATION, CADELGA LIMESTONE (Lake Eyre Basin), MIRIKATA FORMATION (Billa Kalina Basin), GARFORD FORMATION, MANGATITJA LIMESTONE and equivalent units (Eucla Basin palaeodrainage): Lacustrine dolomite and clay. MIRACKINA CONGLOMERATE (Lake Eyre Basin): Fluviatile sand, often silcreted; ROWLAND FLAT SANDS (Barossa Basin): Fluviolacustrine sediments, including lignite.
- Lacustrine beach ridges of WATCHIE SANDSTONE (Billa Kalina Basin).
- Undifferentiated, colluvial to alluvial, extensively reworked silcreted sand and dolomite of Palaeocene-Eocene to Miocene-Pliocene age, including MT SARAH SANDSTONE; includes thin Pleistocene colluvial deposits. DOONBARA FORMATION: Ferruginous, pisolitic and calcareous sand. Undifferentiated Tertiary sand.

PALAEOCENE-EOCENE

- EYRE FORMATION: Fluviatile sand and conglomerate, usually silcreted (Lake Eyre Basin); HAMPTON SANDSTONE: marine sand (Eucla Basin); NORTH and SOUTH MASLIN SANDS: Fluviatile to marginal marine siliceous sand (St Vincent Basin); WILLALINCHINA SANDSTONE: Fluvial sand (Billa Kalina Basin).

EOCENE-MIOCENE

- NULLARBOR LIMESTONE (Eucla Basin); MELTON LIMESTONE, PORT WILLUNGA FORMATION, BLANCHE POINT FORMATION (St Vincent Basin); MORGAN LIMESTONE (Murray Basin); GAMBIER LIMESTONE (Gambier Basin): Marine limestone.

MESOZOIC

CRETACEOUS

- MT HOWIE SANDSTONE: Coarse channel sand; WINTON FORMATION, BLANCHEWATER FORMATION: Fluvio-lacustrine mudstone and siltstone; MACKUNDA FORMATION: Marginal marine sandstone and siltstone.
- OODNADATTA FORMATION: Marine mudstone.
- COORIKIANA SANDSTONE: Marginal marine sandstone and mudstone.
- BULLDOG SHALE: Marine mudstone.
- CADNA-OWIE FORMATION (Kc): Transitional, non marine to marine sandstone and siltstone.

JURASSIC

- ALGEBUCKINA SANDSTONE (Ja): Fluviatile sandstone.
- POLDA FORMATION (Jp): Fluviatile sandstone and conglomerate.
- WISANGER BASALT.

TRIASSIC

- LEIGH CREEK COAL MEASURES and equivalent units.

NOTE: Not all units shown in this legend appear on the geological map.

PALAEOZOIC

CARBONIFEROUS-PERMIAN

- CAPE JERVIS FORMATION (Troubridge Basin); BOORTHANNA FORMATION, STUART RANGE FORMATION (Arckaringa Basin): Glaciomarine and fluvioglacial sediments, including diamictite. ALPANA FORMATION (near Blinman). RADIUM RIDGE BRECCIAS and MOUNT GEE SINTER (Mt Painter Inlier).

DEVONIAN-CARBONIFEROUS

- ?Carboniferous WAITOONA BEDS: Alluvial fan sandstone and conglomerate; ?Devonian MINTABIE BEDS: Fluvio-deltaic sandstone and siltstone.

ORDOVICIAN

- MUNDA SEQUENCE, including MOUNT CHANDLER SANDSTONE: Shallow marine to deltaic sandstone, siltstone and shale.
- Granitoids (OR), acid volcanics (Ov) and basic intrusives (Oß) of the Delamerian Orogeny.
- KULYONG VOLCANICS: Basalt.

CAMBRIAN

- TRAINOR HILL SANDSTONE: Deltaic sandstone, siltstone and shale; MT JOHNS CONGLOMERATE: Fan-delta conglomerate and sandstone.
- ARCOEILLINNA SANDSTONE: Fluvio-lacustrine and aeolian lithic sandstone; OBSERVATORY HILL FORMATION: Playa siltstone, shale, carbonate and chert; WALLATINNA FORMATION: Fluvial arkose and conglomerate (Єo). WIRRILDAR BEDS (Єw): Feldspathic sandstone, siltstone and dolomite.
- LAKE FROME GROUP, WIRREALPA LIMESTONE, BILLY CREEK FORMATION (Єf): Shallow marine to terrestrial redbeds, marine limestone.
- Pyritic metasiltstone.
- KANMANTOO GROUP (Єk): Marine, lithic metasandstone, phyllite, schist, gneiss, minor calcsilicate and marble.
- Mafic to intermediate TRURO VOLCANICS (V).
- HAWKER and NORMANVILLE GROUPS (Єh): Marine shelf to basinal carbonate, minor sandstone. Includes marginal marine sandstone of URATANNA FORMATION below HAWKER GROUP.
- KANGAROO ISLAND GROUP (Єi): Shallow marine sandstone, quartzite, shale and conglomerate.

PROTEROZOIC

NEOPROTEROZOIC

ADELAIDEAN

- MOORILYANNA CONGLOMERATE, LEVENGER FORMATION.
- WILPENA GROUP: Dominantly marine shale, siltstone, sandstone and limestone.
- ABC RANGE QUARTZITE and equivalents: Deltaic sandstone.
- UMBERATANA GROUP: Marine and marginal marine siltstone and sandstone; oolitic, sandy and stromatolitic limestone. Glaciomarine diamictite and siltstone and aeolian sandstone at top.
- Glaciomarine diamictite, sandstone, siltstone, conglomerate and ironstone.
- BURRA GROUP: Marine shale and siltstone; deltaic sandstone; lagoonal and lacustrine stromatolitic limestone and sedimentary magnesite.
- EMEROO SUBGROUP: Fluvio-deltaic sandstone, conglomerate, siltstone and minor dolomite.
- CALLANNA GROUP: Evaporitic clastics and carbonates.
- WOOLTANA VOLCANICS and equivalent units: Basalt (V). Diapiric carbonate-cemented breccia.

MESOPROTEROZOIC

- BEDA VOLCANICS: Basalt; BACKY POINT FORMATION: Fluviatile sandstone and conglomerate.
- KULGERAN SUITE: Granitoids of Musgravian Orogeny. GILES COMPLEX: Basic to ultrabasic intrusive complex.
- PANDURRA FORMATION: Fluviatile sandstone.
- Anorogenic granitoids: HILTABA SUITE, CHARLESTON, TICKERA and ARTHURTON GRANITES (Gawler Craton); includes BALTA GRANITE (Mt Woods Inlier), and equivalents within the Willyama, Mt Babbage and Mt Painter Inliers.
- Felsic metavolcanics (Mt Babbage and Mt Painter Inliers).
- Upper GAWLER RANGE VOLCANICS, including YARDEA DACITE: acid volcanics.
- Middle GAWLER RANGE VOLCANICS: Acid volcanics.
- Lower GAWLER RANGE VOLCANICS, including ROOPENA VOLCANICS: Acid and basic volcanics.
- BLUE RANGE BEDS (Pb): Sandstone, conglomerate. LABYRINTH FORMATION (Py): Lithic sandstone, conglomerate, chert. CORUNNA CONGLOMERATE (Pc): Sandstone, talus breccia, conglomerate, siltstone.

PALAEOPROTEROZOIC

- NUYTS VOLCANICS: Rhyolite, rhyodacite.
- TARCOOLA FORMATION: Quartzite, shale, conglomerate.
- McGREGOR VOLCANICS: Acid and basic volcanics; MOONABIE FORMATION: Volcaniclastic sandstone.
- MYOLA VOLCANICS and MOONTA PORPHYRY: Metarhyolite and metarhyodacite; BROADVIEW SCHIST and DOORA SCHIST: Quartzite, schist, amphibolite. PEAKE METAMORPHICS (Peake and Denison Inliers): Metasediments, metavolcanics.
- Orogenic granitoids: LINCOLN COMPLEX (southern Gawler Craton) gneiss and migmatite, foliated and non-foliated granitoids. ENCENINA ADAMELLITE (Mt Woods inlier), MUCKANIPPIE DIORITE (northwestern Gawler Craton), WIRRIECURRIE GRANITE (Peake and Denison Inliers), WATARU GNEISS (Musgrave Block).
- BIRKSGATE COMPLEX (Pr, Musgrave Block): metasediments, gneiss, granulite. WILLYAMA COMPLEX (Willyama Inliers), and equivalents within the Mt Babbage, Mt Painter and Mt Lofty Ranges Inliers (Pw): Metasediments, gneiss, calcsilicate.
- Amphibolite (Willyama Inliers).
- BOSANQUET FORMATION (V): Rhyodacite. HUTCHISON GROUP (Gawler Craton): Clastic and chemical metasediments, amphibolite.
- Iron Formation.
- WARROW QUARTZITE: Micaceous, feldspathic quartzite.
- MILTALIE GNEISS: Gneiss and amphibolite.

ARCHAEAN

- SLEAFORD COMPLEX (southern Gawler Craton) and MULGATHING COMPLEX (northern Gawler Craton): Metasedimentary and granitic gneiss, amphibolite (including pillow basalt, komatiite); granitoids.
- Iron formation.
- Lamprophyric intrusives including kimberlitic rocks. Ages uncertain but include Delamerian and Jurassic.

Figure 3b Reference for surficial geology map of Eyre Peninsula (Figure 3a)

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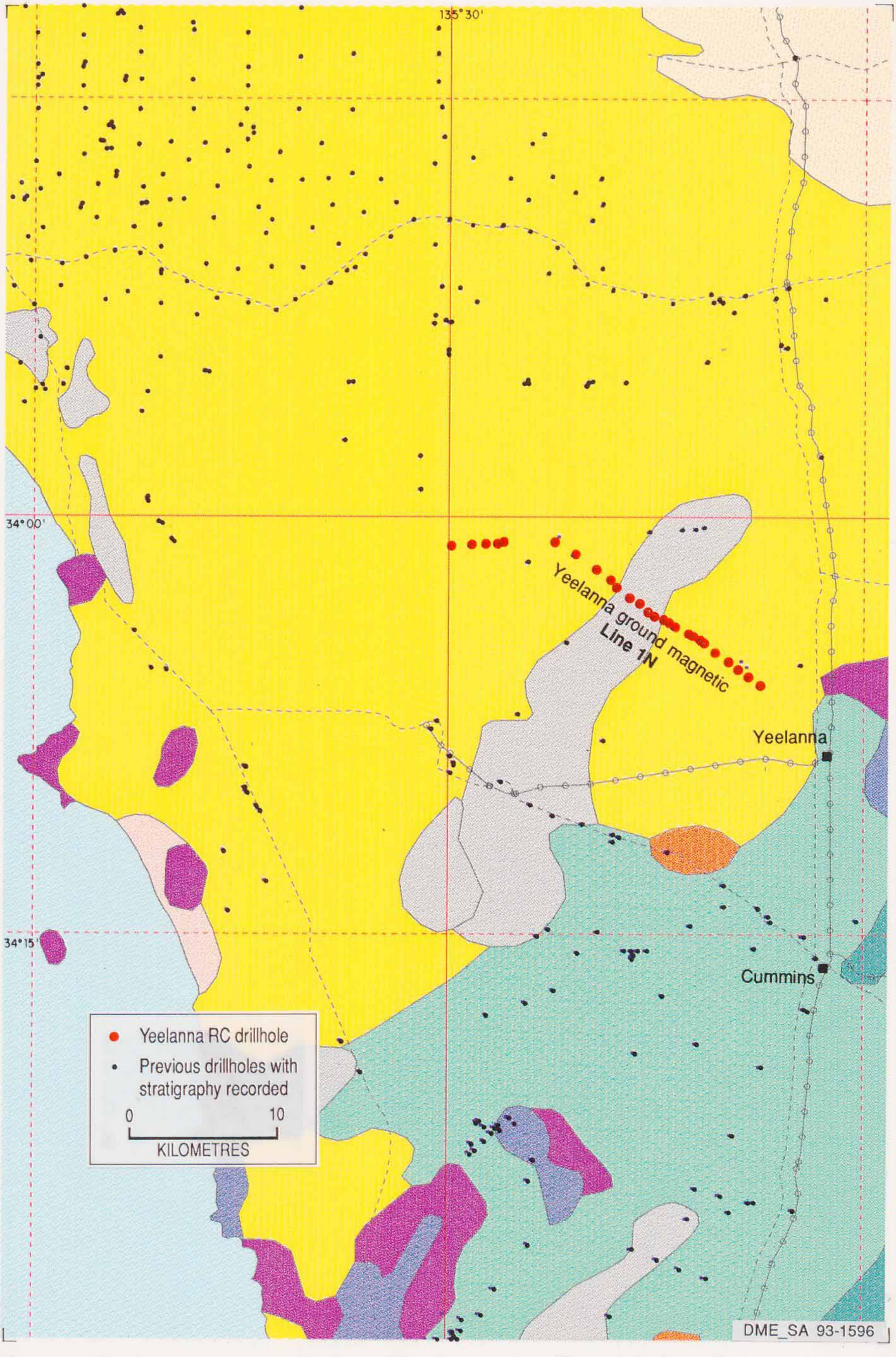

Figure 4 Previous drillholes and Yeelanna RC drillholes (see Figure 3 for legend)

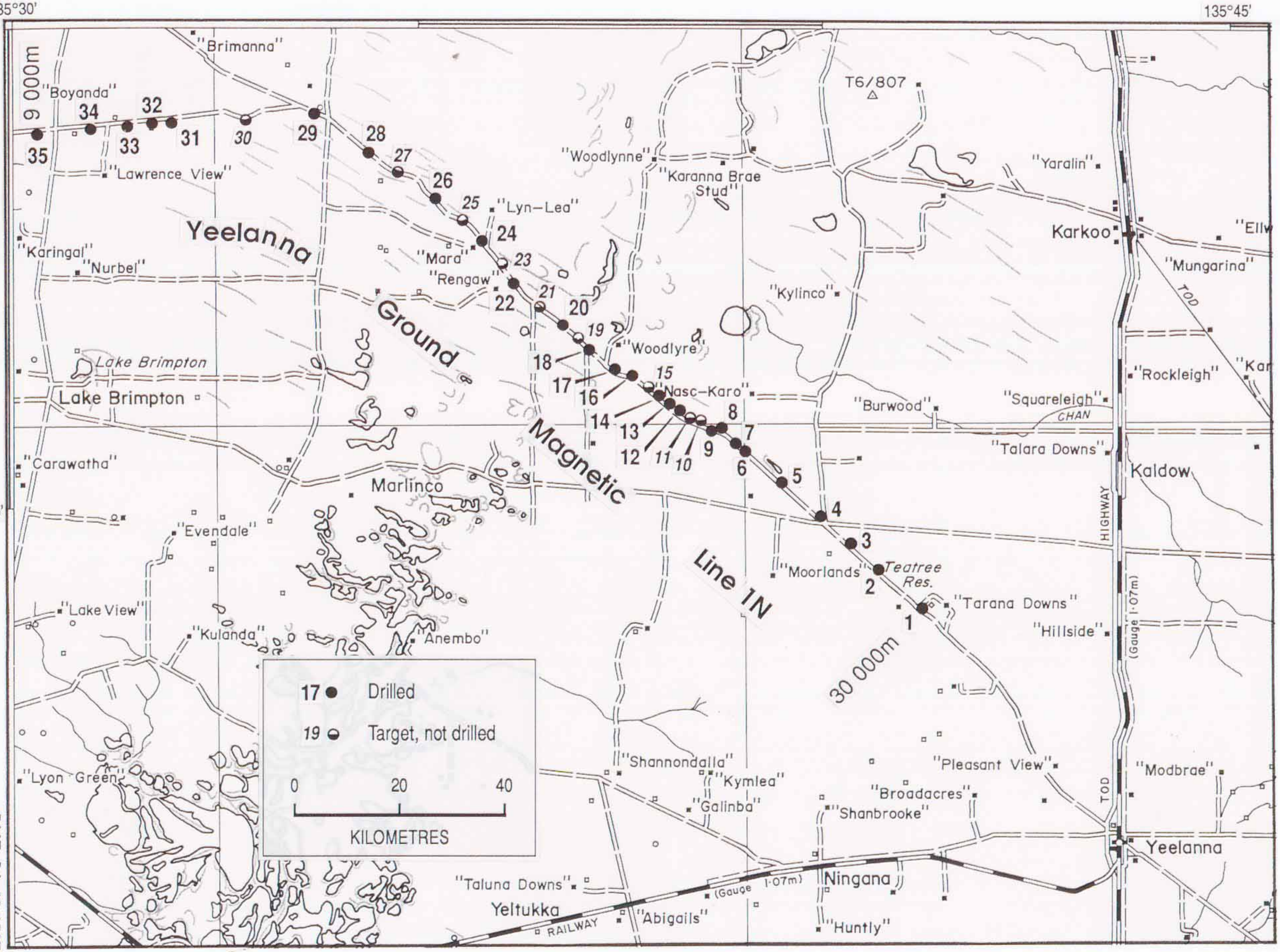

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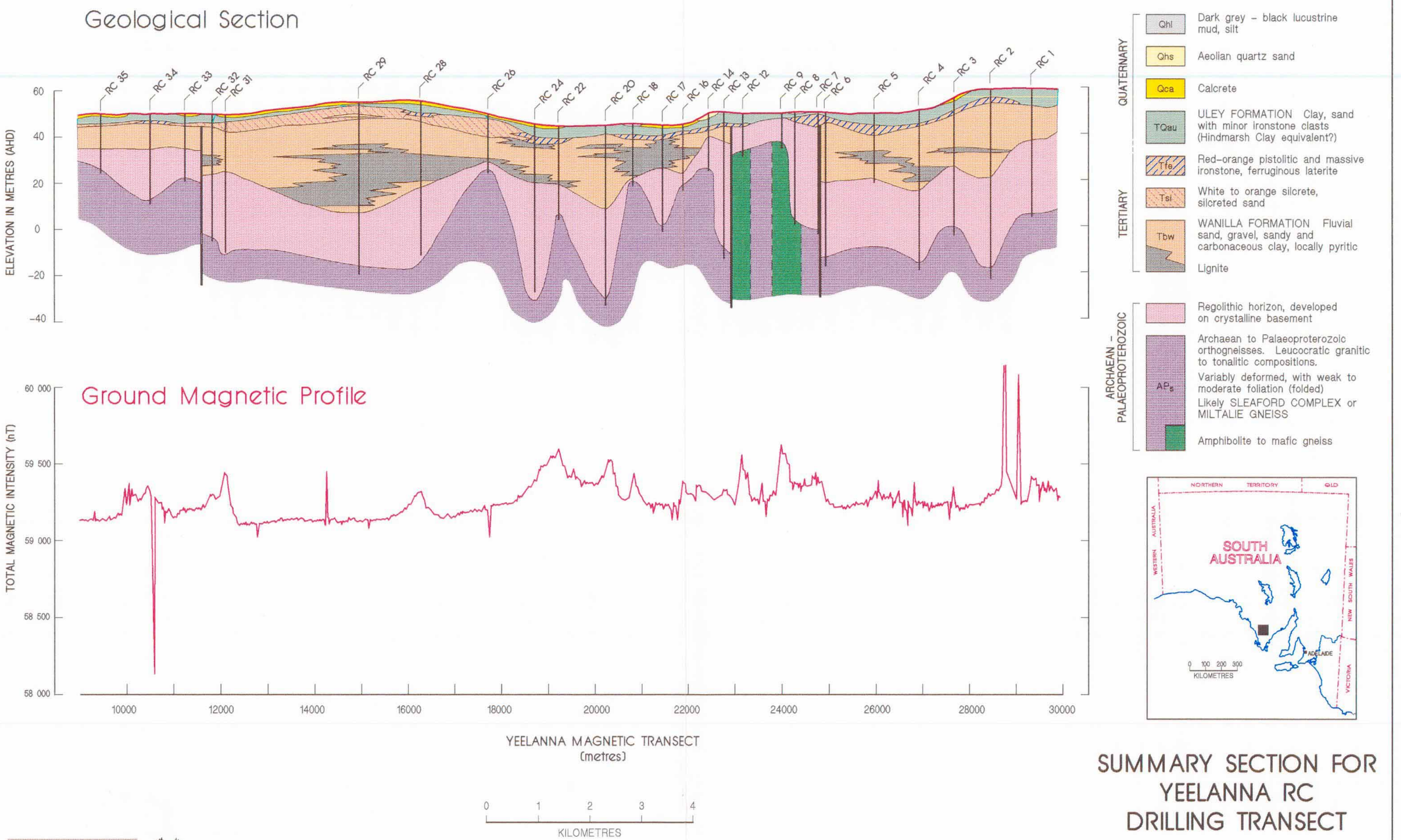
Figure 5 Location of Yeelanna drillholes



SUMMARY SECTION FOR YEELANNA RC DRILLING TRANSECT

Figure 6
DME–SA 93–1598

MINES AND ENERGY
SOUTH AUSTRALIA

QD-DORA 5933LR.DTA

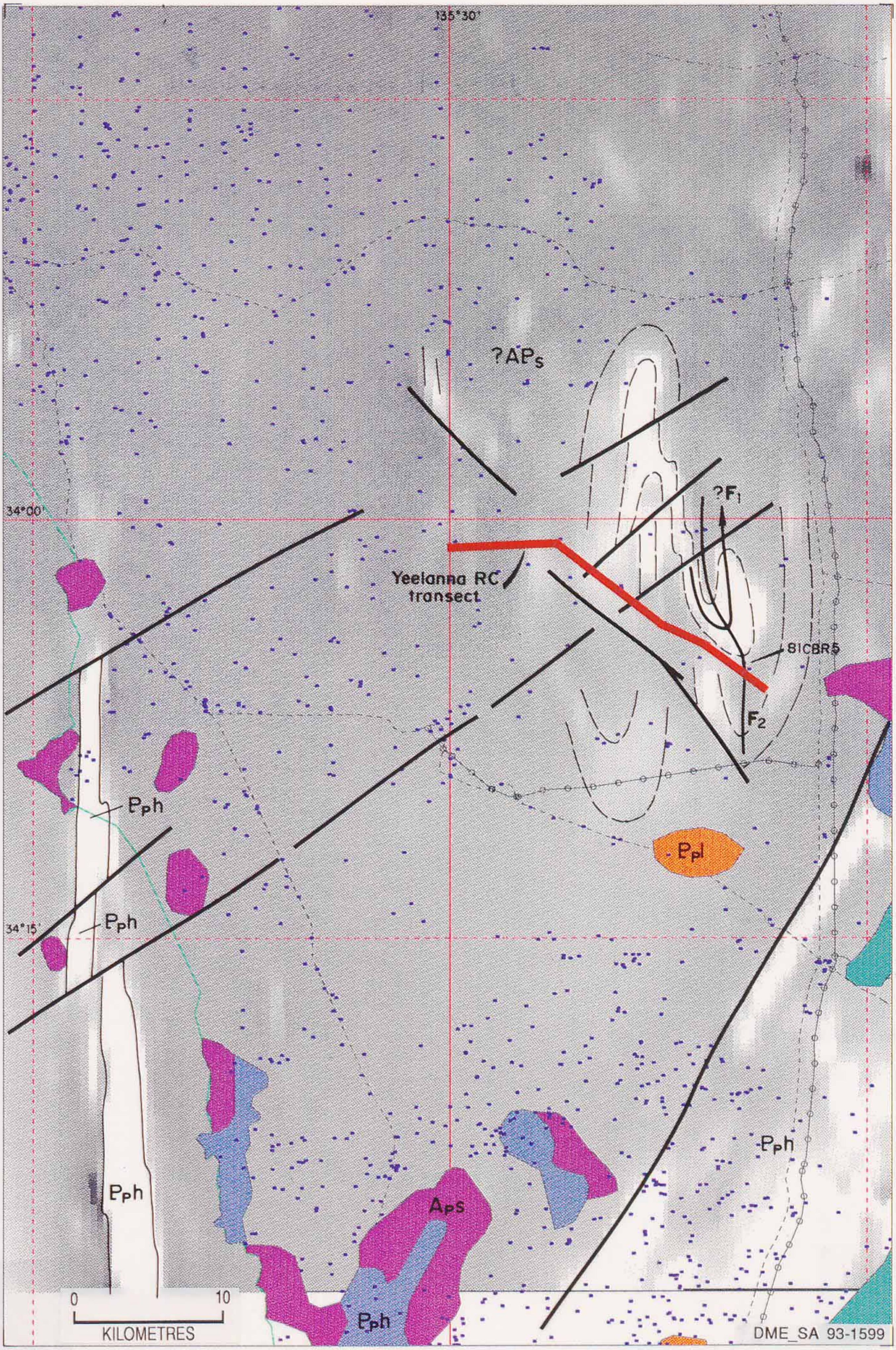


Figure 7 Superimposed TMI aeromagnetics, basement outcrop and drillholes. Structural trends interpreted.