DEPARTMENT OF MINES AND ENERGY

GEOLOGICAL SURVEY

SOUTH AUSTRALIA

REPORT BOOK 93/41

BURRA-NACKARA ARC BEDROCK DRILLING PROGRAMME TEROWIE AREA

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Burra-Nackara Arc Bedrock Drilling Programme Terowie Area

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Thirty reverse circulation drill holes, totalling 1123 m (av 37.4 m) were drilled on Terowie 1:50 000 sheet to determine bedrock geology and geochemistry below Quaternary cover, with a view to testing:

- **a circular depression 1.5 km in diameter centred on Hiles Lagoon, with coincident aeromagnetic negative anomaly, for a concealed kimberlite pipe.**
- **the Umberatana - Burra Group unconformity around the 'Terowie Dome' for gold mineralization.**
- **a northwesterly trending Landsat lineament corridor with coincident linear gravity and aeromagnetic anomalies.**
- **anomalous gravity low zones.**

Two of the drill holes intersected kimberlite dykes, one is adjacent to Hiles Lagoon and both are within the Landsat lineament corridor. The question of a kimberlite pipe concealed beneath Hiles Lagoon is unresolved. Samples from twenty of the drillholes recorded anomalous gold (up to 40 ppb) with associated elevated zinc, nickel and cobalt. Most of the anomalies are adjacent to the Umberatana - Burra Group unconformity around the 'Terowie Dome'. The kimberlite dykes are anomalous in gold (up to 42 ppb) and within the range expected for kimberlite associated with gold mineralization. The area is considered prospective for Telfer-style gold mineralization and diamondiferous kimberlite.

INTRODUCTION

From 17th to 23rd February 1993 a reverse circulation (RC) drilling programme was undertaken on Terowie 1:50 000 sheet as part of the Burra - Nackara Arc bedrock drilling programme, a Department of Mines and Energy South Australia (MESA) Exploration Initiative Project. Other reports of the regional programme include McCallum, Hill, Janz and Crettenden (1993) and Janz (1993).

Drilling was carried out by MESA Drilling Branch. Drill hole traverses were sited on gravity, magnetic and structural features to determine bedrock geology and geochemistry below surficial cover with the view to furthering the knowledge of the Terowie Kimberlite Province.

Ground magnetic surveys were carried out by Mineral Resources Branch personnel along all drill hole traverses. Magnetic susceptibility and radiometric measurements were taken over 2 m intervals on all drill logging samples. Selected down hole samples and bottom hole basement samples were collected separately for geochemical

analysis by Amdel, selected check samples were analysed by Analabs and selected samples were petrologically examined by Amdel.

PREVIOUS EXPLORATION

Exploration for kimberlite and diamond in the Terowie area began in 1969 with the granting of Special Mining Lease 301 to Stockdale Prospecting Ltd. They undertook intensive stream and loam sampling for the kimberlitic indicator minerals; chrome pyrope, picro-ilmenite, chrome diopside and diamond, locating a number of kimberlite dykes and diatremes (Anglo American Corp (Aust) Ltd, 1970; Colchester 1972a and 1972b).

Fracture and lineament analysis to locate clusters and intersections of fractures that may control the emplacement of kimberlite has been conducted by Savata Pty Ltd (1980) and Jingellic Minerals N.L. (1980).

Geochemical analysis of soil samples has been used extensively by Western Queen (SA) Pty Ltd (1981), Savata Pty Ltd (1980) and Jingellic Minerals N.L. (1980). Niobium, strontium, nickel and chromium were found to be useful pathfinder elements for kimberlite.

Detailed aeromagnetic surveys have been flown over a large part of the region by Dampier Mining Co Ltd (1980, 1981 a, b, c and 1982) and CRA Exploration Pty Ltd (1983, 1986a and b). Drilling showed that positive magnetic anomalies are due to basic intrusions, concentrations of magnetic minerals in drainage systems and kimberlite.

A ground gravity survey followed by shallow auger drilling (average depth 2.8 m) to bedrock in the vicinity of Terowie and Hiles Lagoon was completed by MESA (Hough and Morris, 1989). A gravity low was located over the township of Terowie at the intersection of northwesterly and north-south trending gravity lows (Fig. 4). A kimberlite dyke or sill was intersected in one of the auger holes.

A ground gravity and magnetic survey was conducted within and adjacent to the Terowie township (Allender, 1991). The survey extended the previous MESA gravity survey and defined a discrete gravity anomaly 3 km north of the township. Kimberlite dykes were noted in three small quarries located immediately west of Terowie, 1.5 km south of Terowie and immediately east of Hiles Lagoon (Fig. 5).

GEOLOGICAL SETTING

Terowie is located in the hinge zone of the Nackara Arc, near the eastern margin of the Adelaide Geosyncline, where the regional trend of Adelaidean sediments swing from north-south to northeasterly (Fig. 1). The sediments are folded into a series of broad regional synclines and laterally compressed anticlines. Burra Group sediments, comprising shale and siltstone with dolomite and sandstone interbeds, are confined to the cores of anticlines and are overlain unconformably by glacial - interglacial sediments of the Umberatana Group (Fig. 2). A north-northeasterly trending dome structure of this style (referred to in this report as the 'Terowie Dome')

is centred on Terowie (Preiss, 1983) and is the major geological structure of the area under investigation (Fig. 2).

Known gold mineralization around the Nackara Arc is closely associated with the Umberatana - Burra Group boundary, particularly the arenaceous beds of Appila Tillite at the base of the Umberatana Group (Table 1). The competent arenaceous beds commonly host auriferous quartz veins near noses of anticlines and/or where crossed by northwest trending lineaments (Morris and Horn, 1990).

The hinge zone of the Nackara Arc near Terowie is recognised as a kimberlite province following the discovery of numerous kimberlite pipes and dykes since 1969 (Colchester, 1972a and Ferguson, 1980). The kimberlites, of Jurassic Age, generally intrude Burra or Umberatana Group sediments near the hinge zone of regional anticlines (Fig. 2). The largest pipe recorded is Pine Creek (6.35 ha). Their composition indicates a source from the upper mantle (60-70 km), significantly shallower than known diamondiferous kimberlites (> 125 km) (Ferguson, 1980).

The kimberlite occurrences are contained within O'Driscoll's (1986) northeast trending G7 structural corridor (Fig. 1) and at Terowie it is crossed by a northwest trending lineament corridor (Fig. 2) visible on LANDSAT MSS and TM imagery. The lineament corridor appears to be significant as it:

- crosses the north-northeasterly regional geological trend
- has associated kimberlite occurrences (Fig. 2).
- is coincident with the aeromagnetic anomaly trend (Fig. 3).
- is coincident with the linear gravity anomaly (Fig. 4).

Hiles Lagoon, located within the northwesterly trending lineament - gravity - magnetic zone, may be an expression of a maar that conceals a kimberlite pipe. The magnetic trend is disrupted over the lagoon (Fig. 3). The lagoon is a large depression 1.5 km across with radial internal drainage. Similar occurrences have been described in South Africa (Khar'kiv, 1990) and a diamondiferous kimberlite has been located beneath Pointe Lake in Canada (Schiller, 19932).

MESA INVESTIGATIONS - 1993

Ground Magnetic Survey

Ground magnetic readings were taken with an Overhauser GSM 19 Memory Magnetometer at 25 m intervals along seven drill hole traverses located on existing roads and tracks (Figs 2 and 5). Traverses, from 1 km to 6 km long and totalling 16 line km, were pegged at 250 m intervals with GPS readings taken to provide location control. Diurnal drift was checked by repeat readings every hour. Ground magnetic profiles are shown in Appendix A.

AGE				FORMATION	REEF DEPOSITS	ALLUVIAL DEPOSITS
CAM-ORD				Delamerian granitoids		
CAMBRIAN	EARLY CAMBRIAN	MORALANA SUPERGROUP	KANMANTOO GROUP	Middleton Sandstone		
				Petrel Cove Formation		
				Balquhidder Formation		
				Tunkalilla Formation		
			INMAN HILL	Tapanappa Formation		
				Talisker Calc Siltstone		
				Backstairs Passage Fm		
				Carrickalinga Head Fm		
			HAWKER GROUP/ NORMANVILLE GROUP	Orapaninna Shale		
				Parara Limestone		
				Wilkawillina Limestone and equivalents		
				Parachilna Formation/ Mount Terrible Formation		
ADELAIDEAN (LATE PROTEROZOIC)	MARINOAN	HEYSEN SUPERGROUP	WILPENA GROUP	Rawnsley Quartzite		
				Bonney Sandstone		
				Wonoka Formation		
				Bunyeroo Formation		
				ABC Range Quartzite		
				Ulupa Siltstone	Nackara Reward	
				Nuccaleena Formation		
			UMBERATANA GROUP	siltstone		
				Grampus Quartzite		
				Pepuarta Tillite	Copperlinka, Ley's, Only A Dream, Pitcairn Range G.F.	
				Gumbowie Arkose	Dustholes G.F.	
				Elatina Formation		
				Trezona Formation		
				Etina Formation		
				Angepena Formation		
				Enorama Shale	Boomerang/Coo-ee, Mannahill G.F., Golden Dewdrop	
				Tarcowie Siltstone	Robertsons, Aureous Line, Eringa/Eringa South, Eukaby Hill, Ajax	
				Cox Sandstone Member	Royal Charlie, Mongolata G.F., Waukaringa G.F.	
				Tapley Hill Formation	Teetulpa G.F.	Teetulpa G.F.
				Appila Tillite/ Wilyerpa Formation	Bumbumbie Hill, Hennigs, Terawie, Kings Bluff G.F. Nillinghaa G.F., Oroma Hill, Moneo Ridge, Mount Grainger G.F., Wonna G.F., Black Hill Claims	Oodlawirra G.F. Johnsons Gully
				Benda Siltstone Pualco Tillite	Boiekevie Hill Prospect	Lovely Gully G.F. Mittopitta G.F. Twighams Lead Uloolo G.F.
	WILLOURAN	WARRINA SUPERGROUP	BURRA GROUP	Kadlunga Slate		
				Gilbert Range Quartzite		
				Mintaro Shale	Taltabooka G.F., Wadnaminga G.F.	
				Saddleworth Formation, Glen Osmond Slate	Wadnaminga G.F., Apoinga, Mintaro G.F., Welsh Prince	
				Undalya/Stonyfell Quartzite	Clare	
				Woolshed Flat Shale		
				Skillogalee Dolomite		
				Aldgate Rhyme Sandstone	Clare	
			CALLANNA GROUP	disrupted evaporite clastics and carbonates commonly in diapirs		
				Wooltana Volcanics		
				Wywyana Formation		
				Paralana Quartzite		

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TABLE 1 Stratigraphic Distribution of Gold Deposits

RC Drilling

Drill holes were sited to determine bedrock geology and geochemistry beneath surficial cover to test:

- a circular depression 1.5 km wide centred on Hiles Lagoon, with coincident aeromagnetic negative anomaly, for a concealed kimberlite pipe.

- the Umberatana - Burra Group unconformity around the 'Terowie Dome' for gold mineralization.

- a northwesterly trending Landsat lineament corridor with coincident linear gravity and aeromagnetic anomalies.

- anomalous gravity low zones.

Thirty holes totalling 1123 m (Av 37.4 m) were drilled along the seven traverses at intervals varying between 200 m and 1000 m (Fig. 5). Depth of holes varied from 14 m to 95 m. Final positioning of drill holes was dependant on features of interest on ground magnetic profiles and accessibility.

Representative logging samples were collected at 2 m intervals in plastic jars for storage at MESA Core Library, while bulk samples for geochemical analysis were collected at selected intervals depending on thickness of basement penetrated, lithology and sample recovery.

Geological drill logs with magnetic susceptibility readings and selected analytical results are presented in Appendix B. No anomalous radiometric readings were recorded during scintillometer scanning of all samples.

Geochemistry

Bulk down hole samples were analysed for Cu, Pb, Zn, Co, Ni, Cr, Ag, As, Mo, Fe and Mn by Inductively Coupled Plasma (ICP) with aqua regia digest; Nb by x-ray fluorescence (XRF) and Au by fire assay with atomic absorption spectrometry (AAS) finished (results in Appendix C). Bulk bottom hole samples of generally fresh basement were analysed for Cu, Pb, Zn, Co, Ni, Cr, Ag, As, Mo Fe, Mn, Cd, P and V by ICP; Nb, Ba, Ce, La, Rb, Sb, Se, Sn, Sr, Th, U and W by XRF and Au, Pt and Pd by fire assay (results in Appendix D). Whole rock analysis by ICP was carried out on selected samples plus a full range of trace elements (results in Appendix E). Check assays of selected samples are shown in Appendix F. Remaining bulk samples and laboratory pulps are stored at MESA Core Library.

Drill Hole Results

Traverses 3343 N and 3068 E (Fig. 5)

These two traverses (drill holes TER 1 to TER 7) are near the north-northeast trending fold axis region of the 'Terowie Dome' which comprises Burra Group siltstone and sandstone.

The traverses also cross a gravity low anomaly located by Allender (1991).

Anomalous drill intersections include:

Hole No. (depth)	Interval (m)	Analyses (ppm except Au, ppb)	Lithology
TER 1	32 - 40	Au 40, Zn 430	siltst/sandst
(53 m)	40 - 46	Zn 310	siltst
	46 - 50	Au 15	siltst, tillite?
	50-52	Zn 200, Ni 145, Co 72	sandst/shale
TER 2	20 -26	Cu 290, Zn 430	shale
(38 m)	26 - 30	Au 6, Cu 150	shale
TER 4	18 - 20	Au 5, Cu 105	siltst/shale
(26 m)	20 - 22	Au 5	siltst/shale
TER 5	10 - 14	Au 3	siltst
	14 - 22	Au 18, Cu 120	siltst/shale
	22 - 24	Au 12	sandst/siltst
TER 7	38 - 42	Au 4	sandst
	42 - 50	Au 3, Cu 107	sandst/chert
	50 - 51	Ag 7.5, Co 190, W 280?	sandst/chert

Anomalous Au, Cu and Zn values are common and are probably related to thin (1-2 cm) quartz veins containing iron oxide filled vugs and white mica. A 'spotted' siltstone with 1 mm spots of FeO after pyrite or carbonate was encountered in TER 4, similar alteration is commonly associated with gold mineralization around the Nackara Arc. Vuggy chert found in TER 7 indicates silicification and possible epithermal activity. The assays and alteration indicate there has been movement of hydrothermal fluids, possibly associated with fracturing along the Terowie Dome fold axis. The gravity low is unexplained but may result from a greater depth of overlying sediment (up to 32 m) and deep weathering of the basement. A source for the distinctive ground magnetic anomaly on traverse 3343 N (Appendix A) was not determined.

Traverse 3040 E (Fig. 5).

This traverse (drill holes TER 8 to TER 11) was located on the western limb of the 'Terowie Dome' and crosses the Umberatana - Burra Group boundary within the northwesterly trending Landsat linear corridor. Minor gold mineralization is known (Morris and Horn, 1990) within arenaceous beds of Appila Tillite, at the base of the Umberatana Group, about 3 km north-northeast of this traverse (Fig. 5).

Anomalous drill intersections include:

Hole No. (depth)	Interval (m)	Analyses (ppm except Au, ppb)	Lithology
TER 8	2 - 10	Au 7	siltst/tillite
(14 m)	10 - 12	Au 4, Ag 2.5	siltst/tillite
TER 9	8 - 16	Au 4, Zn 197, Co 48	siltst
(20 m)	16 - 18	Au 3, Zn 150	siltst
	18 - 20	Zn 145, Rb 370	siltst
TER 10	6 - 16	Au 7	siltst
(32 m)	16 - 24	Au 5, Zn 375, Ni 155	siltst
	24 - 28	Au 7, Zn 240, Nb 34	siltst
	28 - 30	Au 3	siltst
TER 11	4 - 16	Au 3, Zn 247	siltst
	16 -18	Au 3	siltst

Anomalous Au and Zn, detected in all drill holes is probably associated with thin quartz veins (1-2 cm) and micaceous haematite veinlets (1-2 mm) within siltstone. No arenaceous beds similar to those hosting gold mineralization nearby and elsewhere in the Nackara Arc were intersected.

Traverse 3052 E (Fig. 5)

This traverse (drill holes TER 12 to TER 16) crosses the coincident Landsat lineament and linear

gravity low zones near the 'Terowie Dome' fold axis.

Anomalous drill intersections include:

Hole No. (depth)	Interval (m)	Analyses (ppm except Au and Pd,ppb)	Lithology
TER 12	6 - 14	Au 6, Ni 100, Co 270	sandst/siltst
	14 - 18	Au 34, Ba 5525, Cr 295, Ni 580, Nb 88, Sr 185, Ce 140, P 1410, Pd 7, V 120, Co 98	siltst/kimberlite
	18 - 30	Au 4, Ni 138	siltst/shale
	30 -32	Au 6, Cr 210, Ni 700, Nb 72 Sr 300, P 1460, Co 76	shale/kimberlite
	32 - 50	Au 4	siltst/sandst
TER 13 (68 m)	40 - 48	Au 5	siltst/sandst
TER 14 (32 m)	8 - 24	Au 13	siltst/sandst
TER 15 (95 m)	0 - 14	Au 4	sandst/siltst

Anomalous gold values occur within Burra Group siltstone and sandstone hosting thin (1-2 cm) quartz veins and micaceous haematite veinlets (1-2 mm). One of the kimberlitic dykes encountered in TER 12, described as mica peridotite or kimberlite (Appendix G, 6631 RS 304), is highly weathered but has the expected elevated trace metal values (Table 2). The gold content of one of the dykes (6631 RS 301) is anomalous and within the range expected for kimberlite associated with gold mineralization (Rock and Groves, 1988).

Traverses 3089 E and 3010 E (Fig. 5)

These traverses (drill holes TER 17 to TER 19 and TER 29) are located around the margin of Hiles Lagoon with the view to finding evidence for a kimberlitic pipe beneath the lagoon.

Hole No. (depth)	Interval (m)	Analyses (ppm except Au, ppb)	Lithology
TER 17 (26 m)	24-26	Zn 190, Rb 340, La 90, Ce 160	Sandst/shale
TER 18 (53 m)	16 - 26	Cu 115	siltst
	26 - 36	Au 4, Mn 1440, Co 35	siltst
	36 - 52	Zn 220, Co 61, Mn 2567	siltst
	52 - 53	Zn 220, Co 32	siltst
TER 19 (50 m)	28 - 38	Zn 250	siltst
	42 -46	Zn 260	siltst
TER 29 (20 m)	4 - 16	Zn 153, Co 53, Mn 2 150	siltst
	16 - 18	Zn 160	siltst
	18 - 20	Zn 150, Cu 40	siltst

There is no definite evidence for the presence of a kimberlitic pipe beneath the lagoon. Many of the samples are anomalous for Zn, Co and Mn, possibly due to the scavenging effect of MnO-FeO noted as veinlets and along joint plains.

Traverse 3231 N (Fig. 5)

This traverse (drill holes TER 20 to TER 28 and TER 30) is adjacent to Hiles Lagoon and crosses the Landsat lineament corridor with coincident linear gravity and aeromagnetic anomalies.

Anomalous drill intersections include:

Hole No. (depth)	Interval (m)	Analyses (ppm except Au, Pt and Pd ppb)	Lithology
TER 20 (53 m)	36 - 46	Au 22	shale/sandst
	46 - 52	Au 8, Mn 4867	sandst/shale
	52 - 53	Au 4	siltst
TER 21 (16 m)	8 - 16	Au 6, Zn 353, Ni 156, Co 135, Mn 4065	siltst
TER 22 (62 m)	20 - 30	Au 6	siltst
TER 23 (53 m)	4 - 14	Au 3, Zn 155, Co 48, Mn 2100	sandst/siltst
	14 - 16	Au 5, Ba 1320, Cr 830, Ni 6700 Nb 165, Sr 540,	Kimberlite

TABLE 2 Chemistry of Kimberlitic Samples

	Av*	6731 RS 757	6631 RS 304	6631 RS 374
SiO_2 (%)	36.3	32.0	33.1	31.4
TiO_2 (%)	1.0	3.60	0.9	2.5
Al_2O_3	3.2	4.4	3.2	5.5
Fe_2O_3	7.6	10.2	9.5	15.4
MnO	0.2	0.1	0.2	0.4
MgO	29.7	20.7	13.4	12.7
CaO	6.0	10.0	12.7	7.5
Na_2O	0.1	0.2	0.3	0.7
K_2O	3.2	3.2	0.9	1.3
P_2O_5	1.1	0.5	0.6	0.8
LOI	9.6	13.7	23.9	19.5
Au (ppb)	7	<1	6	5
Ba (ppm)	740	1320	530	1320
Ce	-	130	90	250
Co	77	60	76	350
Cr	1440	690	210	830
Cu	100	105	65	90
La	370	90	60	170
Nb	240	125	72	165
Ni	1140	680	700	6700
P	-	2300	1460	2700
Pb	9	5	19	19
Rb	21	175	42	60
Sr	445	540	300	540
V	120	220	65	125
Zn	-	46	44	2450

* Average micaceous kimberlite (Ringwood et. al. 1992).

		Ce 250, P 2700, Pd 13, Pt 5, V 125, Co 350, Zn 2450,	
	16 - 18	Au 3, Ba 2700, Ni 680, Nb 36, Sr 160, Ce 100, Pd 8, Co 195, Zn 370	Siltst/kimberlite
	18 - 28	Zn 200, Ni 150, Pb 55, Co 36, Mn 1300	siltst
	42 - 46	Au 3	
TER 24 (29 m)	2 - 10	Zn 195	sandst/siltst
	16 - 22	Zn 160	sandst/siltst
TER 25 (41 m)	28 - 32	Au 4, Zn 165	sandst/siltst
TER 28 (29 m)	6 - 12	Zn 175	sandst/siltst
	12 - 18	Zn 195, Co 32, Mn 1020	sandst/siltst
	28 - 29	Au 19, P 1200	siltst

Anomalous Au and Zn values occur within sandstone and siltstone near the base of the Umberatana Group. A 2 m thick highly weathered kimberlitic dyke or sill, described as mica peridotite or kimberlite (Appendix G, 6631 RS 374), was intersected in TER 23 and has the expected elevated trace metal values (Table 2) and is highly anomalous for Ni and Zn.

ECONOMIC IMPLICATIONS

Kimberlite - Diamond

The kimberlitic dykes intersected in this drilling programme are highly weathered and on an Al_2O_3 - MgO - total FeO diagram (Cornelissen and Verwoerd, 1975) they plot just outside the kimberlite field due to the loss of MgO and addition of FeO during weathering (Fig., 6). The Pine Creek kimberlite plug, 33 km east of Terowie (Fig. 2) was drilled during an earlier phase of the Burra-Nackara Arc drilling programme (McCallum et. al. 1993) and fresh material plots within the kimberlite field (Fig. 6). Kimberlite from drill holes TER 12 (6631 RS 304) and TER 23 (6631 RS 374) have similar chemistry to the Pine Creek kimberlite (6731 RS 757) and to the average for micaceous kimberlite (Table 2). To date no diamonds have been found within kimberlite at Terowie but typically barren kimberlitic rocks dominate a kimberlite province. Studies indicate the Terowie kimberlite source to be too shallow to be diamondiferous, (Ferguson, 1980) however micro-diamonds have been found in alluvial sediments within the province (Colchester, 1972a) and the presence of diamond bearing kimberlite cannot be discounted.

Gold

Twenty of the thirty holes drilled, intersected Adelaidean meta-sediments anomalous in gold (up to 40 ppb) with associated anomalous zinc (up to 490 ppm), nickel (up to 190 ppm) and cobalt (up to 270 ppm). This association of metals is common from goldfields of the Nackara Arc (Morris and Horn, 1990), indicating a similar mineralizing event near Terowie. The anomalous gold values occur around the 'Terowie Dome' near the Umberatana - Burra Group boundary which is a favourable stratigraphic position for gold mineralization (Table 1). Minor auriferous quartz veins occur in arenaceous beds at the base of Umberatana Group on the western side of the dome (Fig. 6). The potential for significant gold mineralization within the 'Terowie Dome' is indicated by:

- the number and distribution of anomalous gold values

- the presence of favourable host rocks

- a domal structure crossed by a Landsat lineament corridor

- the similarity of lithology, structure and chemistry to Telfer-style gold mineralization (Dimo, 1990).

CONCLUSIONS

Bedrock RC - drilling in the Terowie area has shown:

- twenty of the thirty drill holes encountered gold (up to 40 ppb) values near the Umberatana - Burra Group unconformity around the 'Terowie Dome'.

- anomalous gold values have associated elevated zinc, nickel and cobalt, which is common for goldfields elsewhere in the Nackara Arc and indicates a similar mineralizing event in this area.

- the lithology, chemistry and structural setting indicate potential for Telfer-style gold mineralization within the 'Terowie Dome'.

- Kimberlitic dykes contain up to 42 ppb gold and within the range expected for kimberlite associated with gold mineralization.

- the question of a kimberlite pipe concealed beneath Hiles Lagoon is unresolved but the intersection of a kimberlite dyke adjacent to the lagoon and kimberlite exposed in a quarry nearby add further support to the possibility.

- the gravity lows in the area appear to be the result of a greater thickness of alluvial cover and a greater depth of weathering but a diapiric or deeply weathered kimberlite source cannot be discounted.

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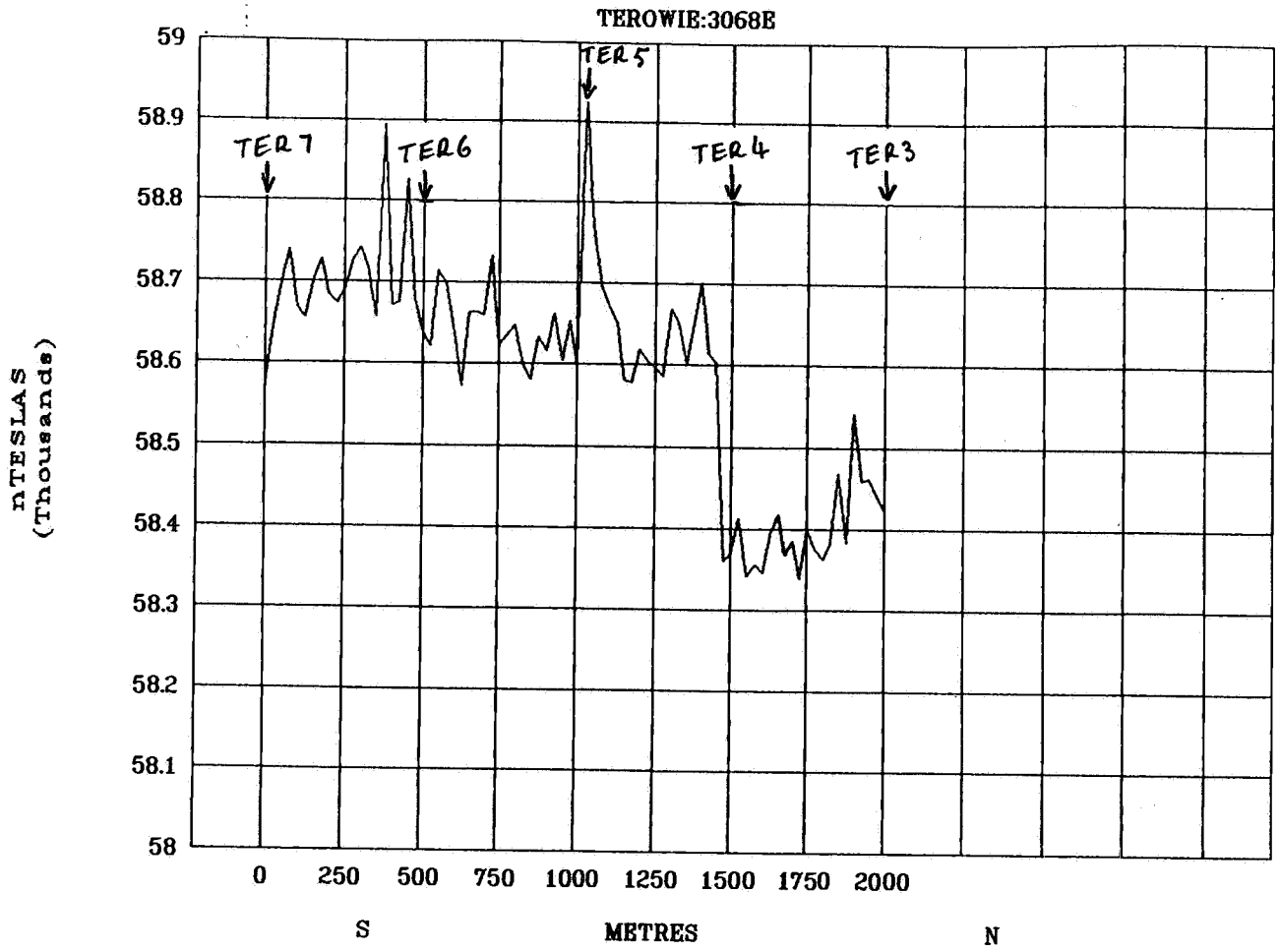
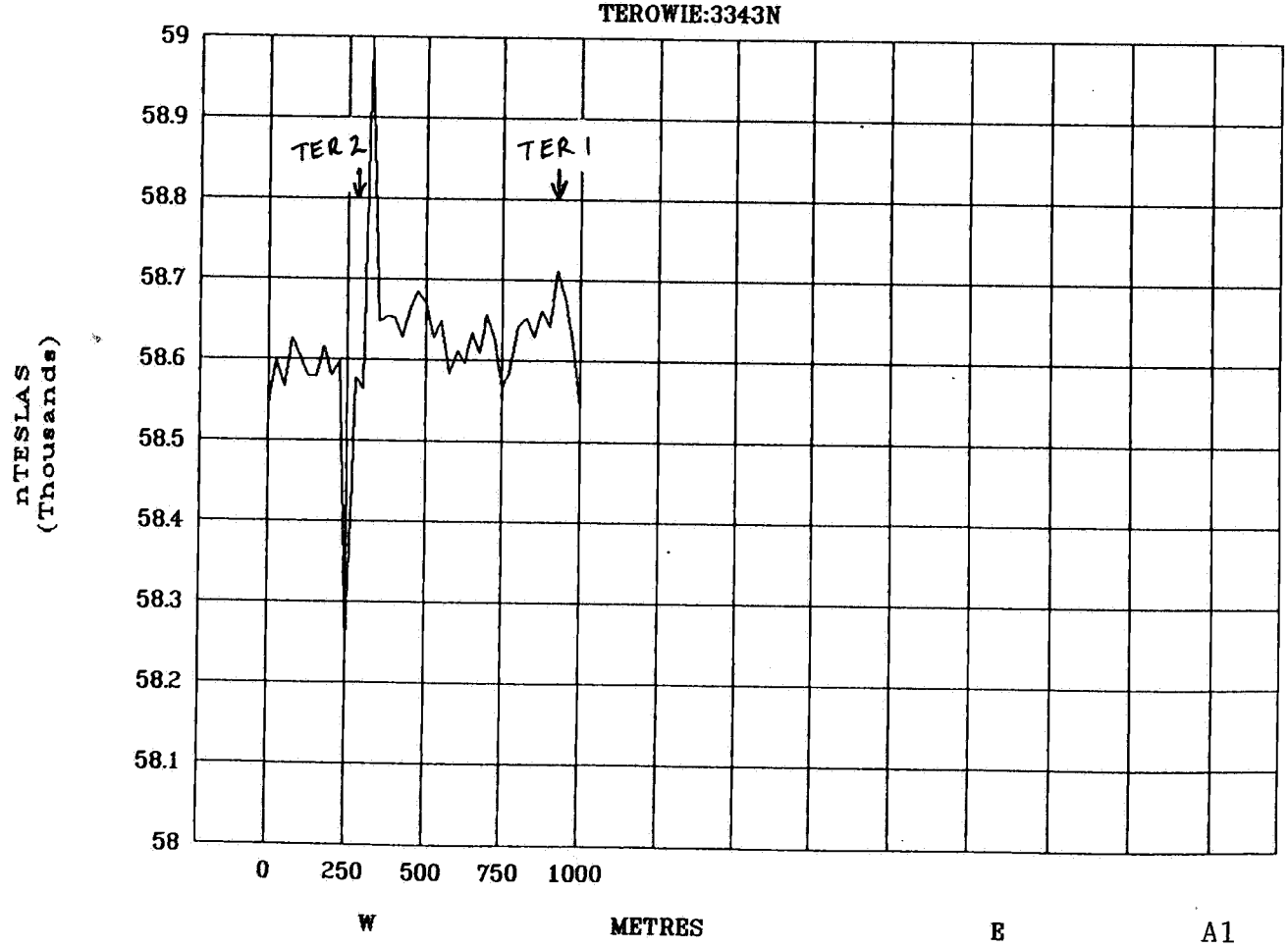
APPENDIX A

Ground Magnetic Profiles

PETERBOROUGH ROAD

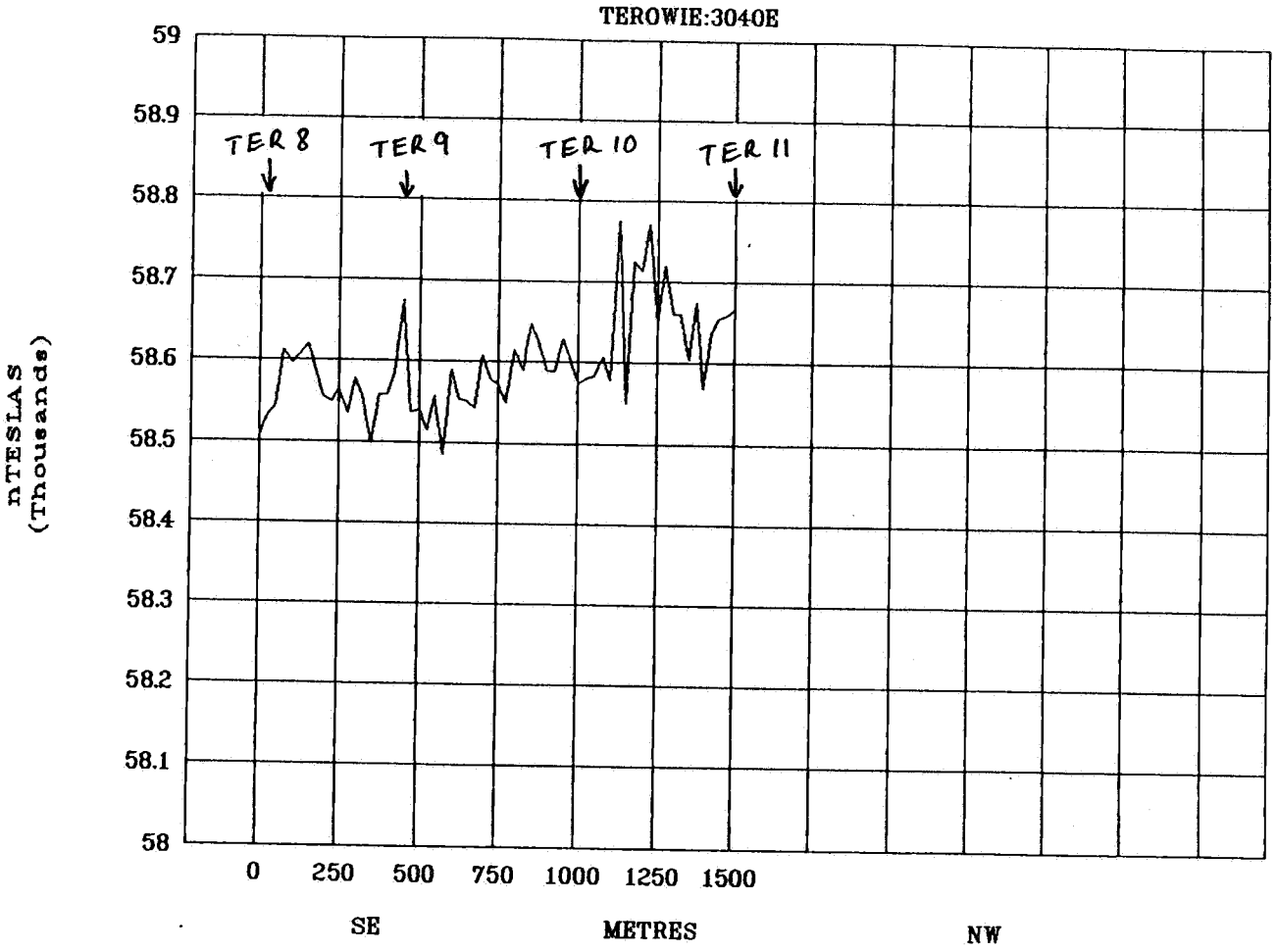


TEROWIE NORTH

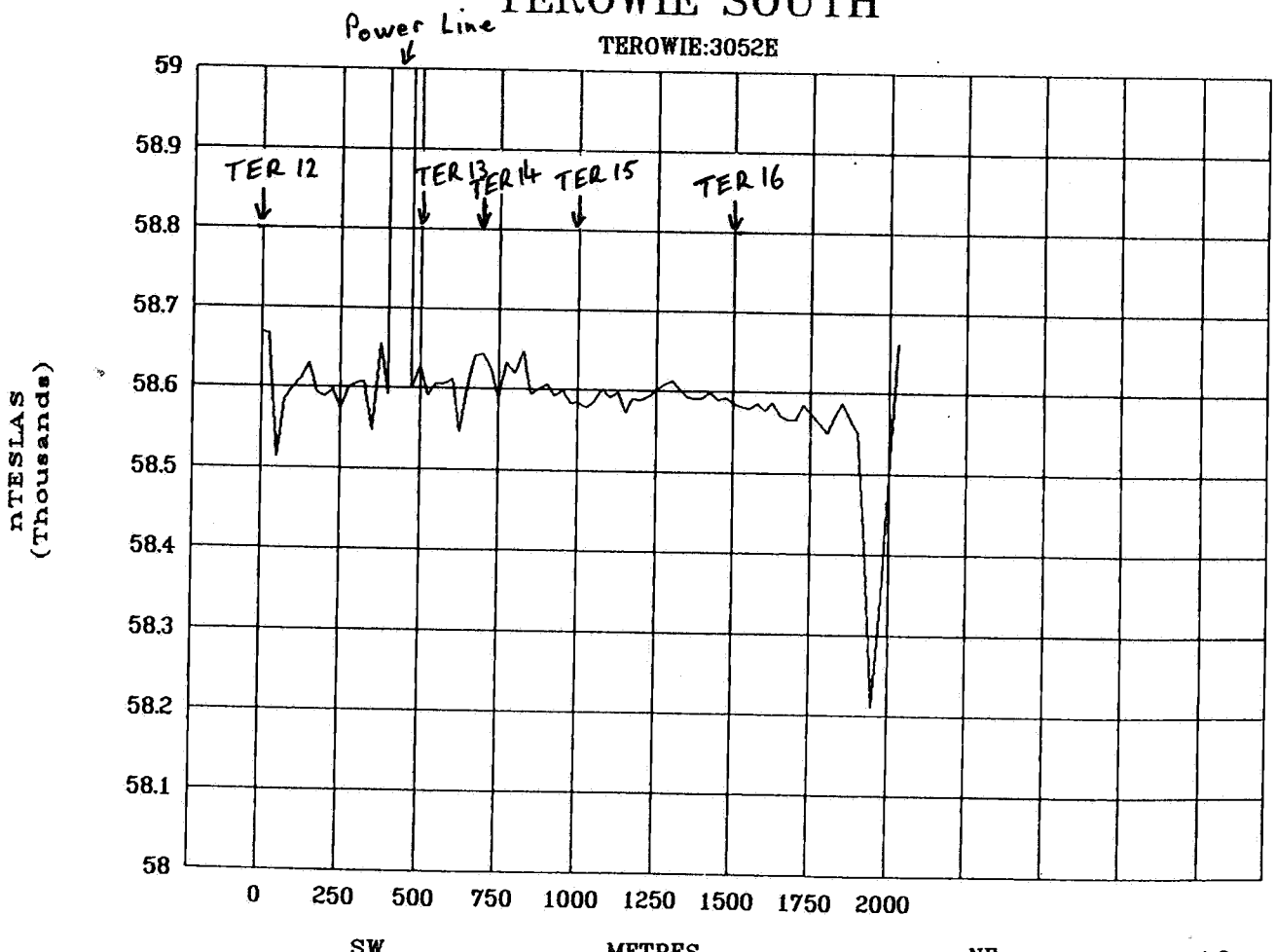


A1

TEROWIE WEST

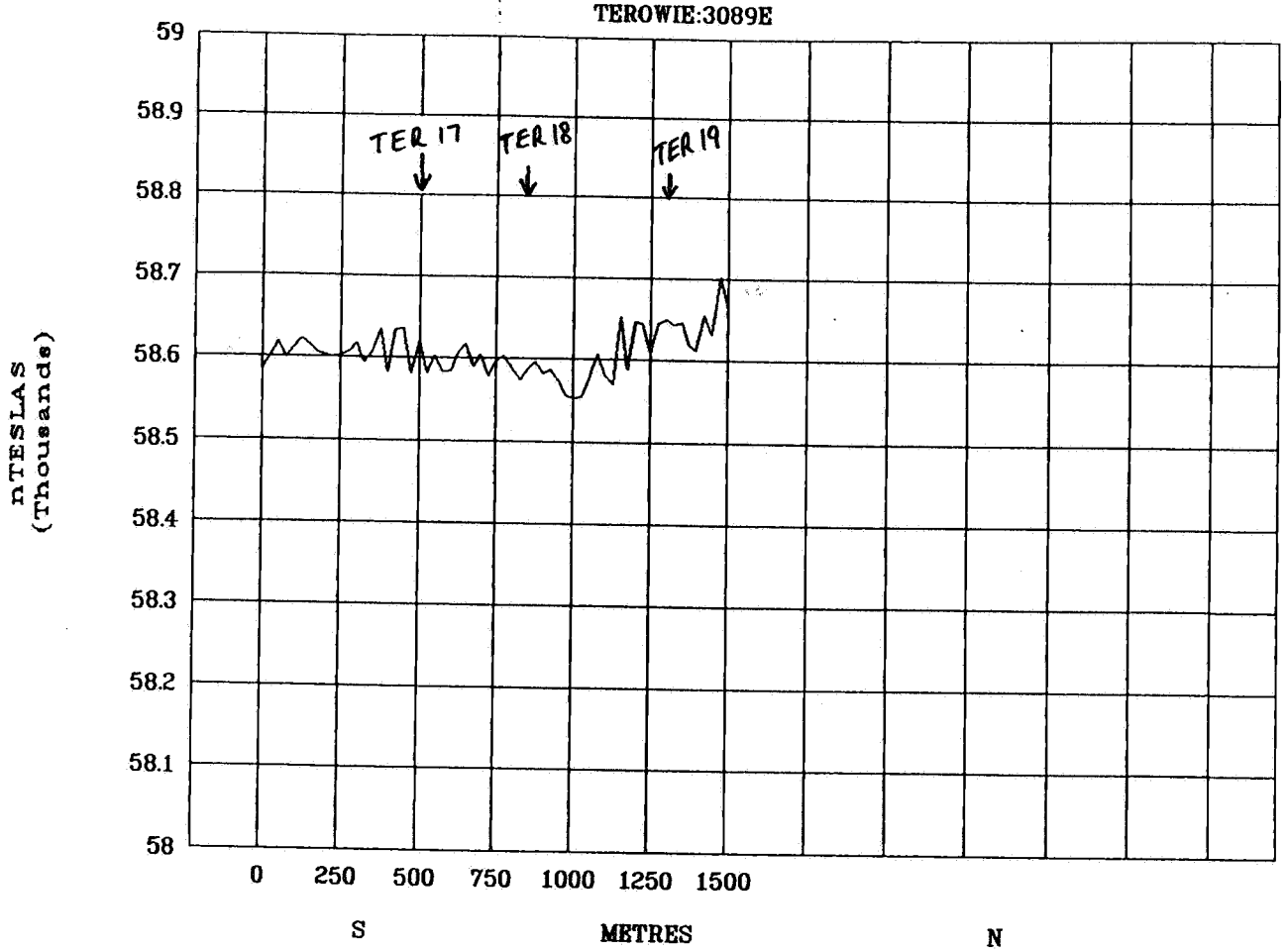


TEROWIE SOUTH



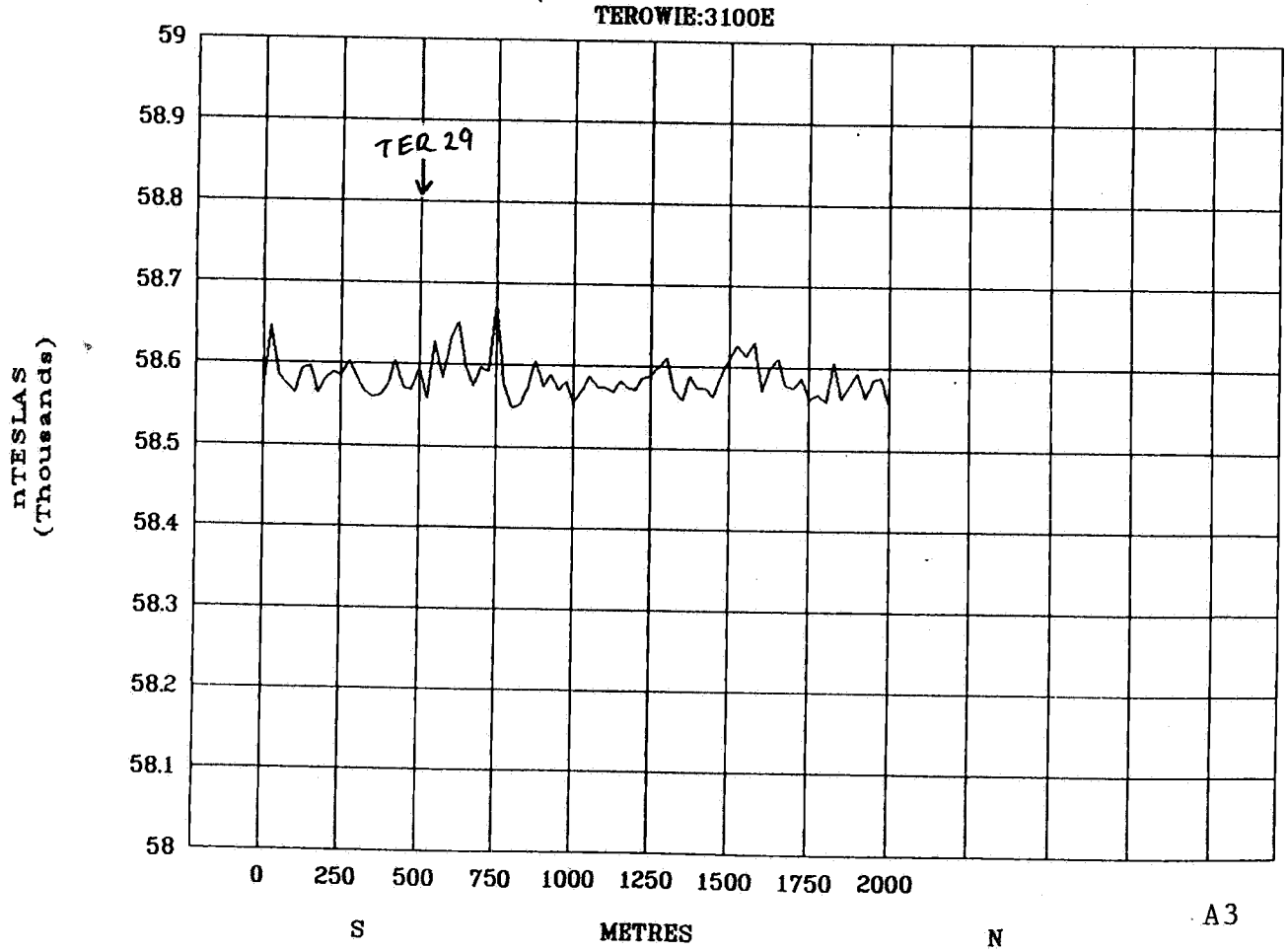
HILES LAGOON WEST

TEROWIE:3089E



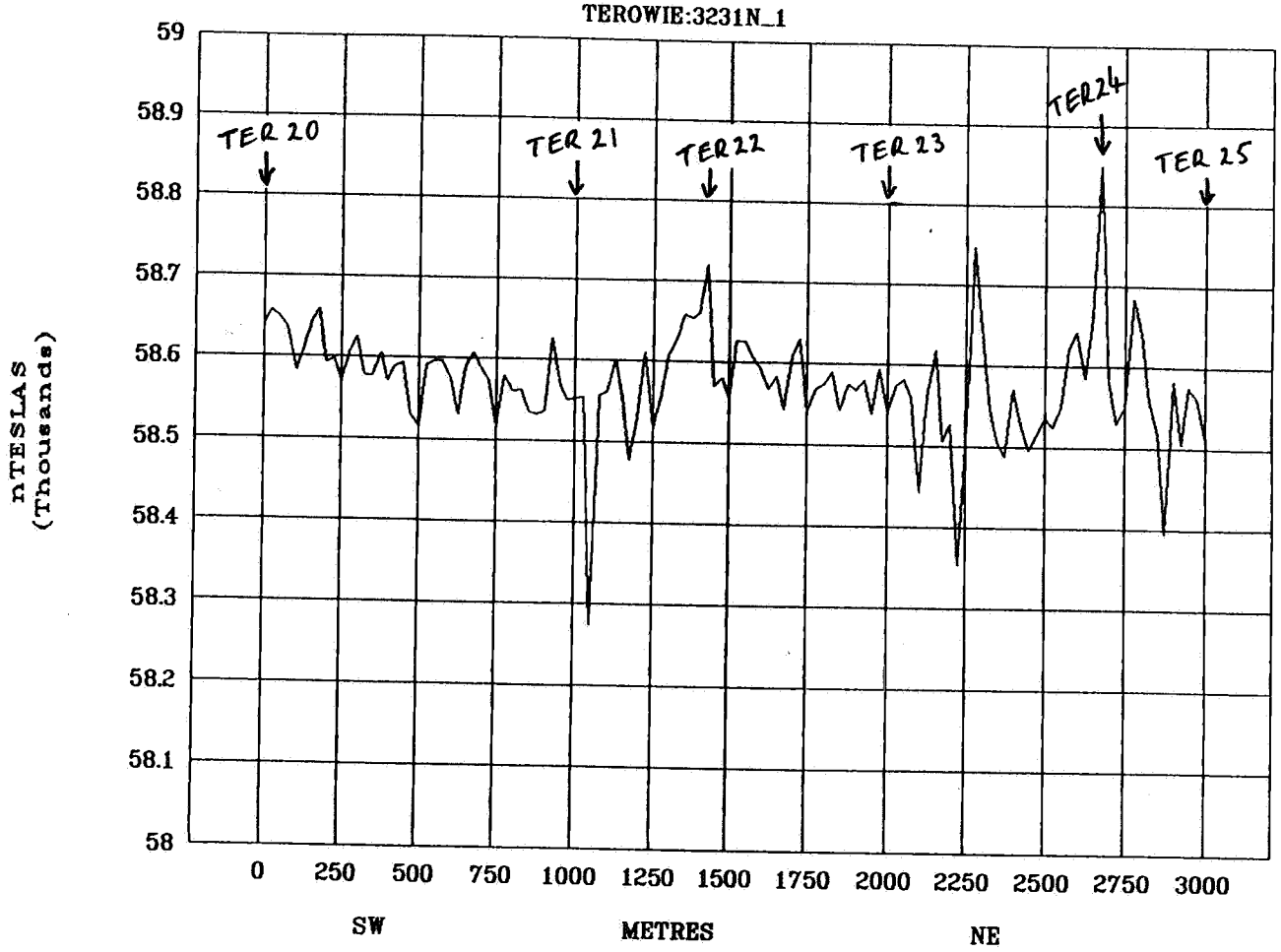
HILES LAGOON EAST

TEROWIE:3100E



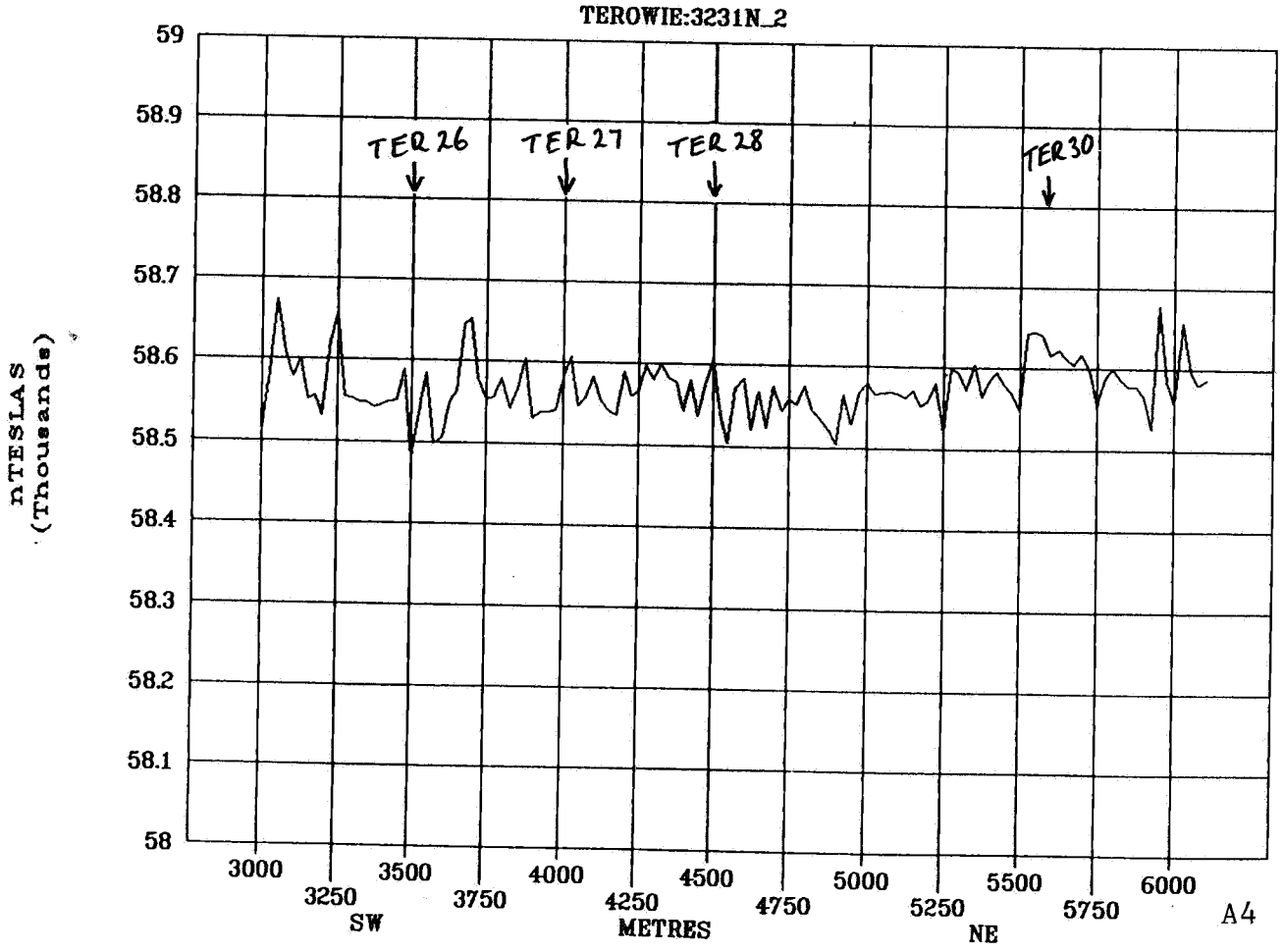
PINE PARK

TEROWIE:3231N_1



PINE PARK

TEROWIE:3231N_2



A4

APPENDIX B

Geological Drill Logs

(TER 1 - TER 30)

Abbreviations Used In Geological Drill Logs

lmst	-	limestone
sandst	-	sandstone
siltst	-	siltstone
lat	-	laterite
bi	-	biotite
hm	-	haematite
spec-hm	-	specular hematite
musc	-	muscovite
qtz	-	quartz
calc	-	calcareous
ferrug	-	ferruginous
lam	-	laminated
frags	-	fragments
pebs	-	pebbles
b	-	brown
bl	-	black
g	-	green
gr	-	grey
p	-	pink
r	-	red
w	-	white
y	-	yellow
w	-	weathered
HW	-	highly weathered
MF	-	moderately fresh
M	-	multi-element assays
S	-	silicate analysis
C	-	check assays
P	-	petrology

HOLE NO: TER 1

100 000 SHEET NO: 6631

TRAVERSE: 3343 N STATION: 950 E

LOCATION: 307400 E
6334153 N

DATE DRILLED: 17/2/93

DRILLING METHOD: RC

LOGGED BY: B J MORRIS

TOTAL DEPTH: 53 m

Depth Interval (m)	Lithology	MS	Sample Interval (m)	Sample No-RS	Selected Analyses (ppm except Au, ppb) Cu Pb Zn Co Cr Ni Nb Au
0-2	r.b. sandy clay some lat., qtz pebs.	3.0			
2-4	b. sandy clay c̄ sub-round pebs gr-g siltst and sandst.	3.1			
4-6	as above plus r. siltst, bl FeO, qtz pebs.	2.8			
6-8	as above plus pale gr clay-calc	0.4			
8-10	as above	0.6			
10-12	pale b silty-clay c̄ b. FeO pebs.	0.4			
12-14	as above	0.5			
14-16	pale y-b silty-clay c̄ some hm patches.	0.2			
16-18	as above	0.5			
18-20	as above c̄ b FeO pebs and qtz.	0.8			
20-22	mottled b-gr silt-clay with b. FeO pebs.	0.5			
22-24	as above plus r-b siltst and ferrug. sandst pebs.	4.4			
24-26	gr-y silt-clay to 25 m then off w clay.	1.3			
26-28	pale gr silt-clay	0.2			

TER 1 (Cont.)

Depth Interval (m)	Lithology	MS	Sample Interval (m)	Sample No-RS	Selected Analyses (ppm except Au, ppb) Cu / Cr	Pb / Ni	Zn / Nb	Co / Au
28-30	as above plus ferug sandst and qtz pebs.	8.8						
30-32	as above	10.1						
32-34	b. silt-clay, pale b silt st frags.	0.6	32-40	242 (C)	80 / 28	8 / 26	430 / 15	11 / 40
34-36	as above with sandy siltst frags.	0.2						
36-38	gr sandst/siltst frags some FeO on joints.	0.1						
38-40	br siltst, minor qtz chips.	0.1						
40-42	pale br-gr clay with patches of y, bl FeO.	0.1	40-46	243	34 / 8	6 / 22	310 / 15	22 / -
42-44	as above some qtz chips and musc. flakes.	0.1						
44-46	w-y mottled clay black hm patches. vein qtz chips. (W)	0.6						
46-48	as above some FeO cubes, some rounded qtz, siltst pebs. (tillite?)	0.8	46-50	244	48 / 13	7 / 42	20 / 14	28 / 15
48-50	as above some mica flakes.	0.1						
50-52	dark br-r ferrug. sandst and shale. (MF)	0.1	50-52	245	55 / 24	5 / 145	200 / 14	72 / 1
52-53	as above, hard EOH 53 m	0.1	52-53	246 (M)	18 / 24	5 / 30	30 / 6	16 / 1

HOLE NO: TER 2

100 000 SHEET NO: 6631

TRAVERSE: 3343 N STATION: 280 E

LOCATION: 306730 E
6334266 N

DATE DRILLED: 17/2/93

DRILLING METHOD: RC

LOGGED BY: B J MORRIS

TOTAL DEPTH: 38 m

Depth Interval (m)	Lithology	MS	Sample Interval (m)	Sample No-RS	Selected Analyses (ppm except Au, ppb) Cu / Cr	Pb / Ni	Zn / Nb	Co / Au
0-2	r-b calc. sandy clay minor qtz pebs.	1.6						
2-4	b sandy-clay with gr-g shale, lat and sandst pebs.	0.6						
4-6	pale b silt-clay with minor pebs of shale, sandst. and lat.	0.3						
6-8	as above.	0.5						
8-10	gr-y clay minor pebs of lat and ferrug sandst.	1.2						
10-12	as above with pebs of FeO and ferrug. sandst.	1.2						
12-14	as above, minor pebs	2.5						
14-16	gr-b silty clay minor pebs of lat. and ferrug shale.	2.7						
16-18	as above.	1.6						
18-20	as above with cobbles of qtz, ferrug. sandst. and shale.	6.0						
20-22	y-b silt-clay with flat frags of b shale and gr sands (HW).	0.2	20-26	247 (C)	290 / 16	32 / 48	430 / 15	36 / 2
22-24	y-b shale, FeO partings in y clay.	0.1						
24-26	dark gr shale bleached along joints. (W)	0.1						

TER 2 (Cont.)

Depth Interval (m)	Lithology	MS	Sample Interval (m)	Sample No-RS	Selected Analyses (ppm except Au, ppb) Cu / Cr	Pb / Ni	Zn / Nb	Co / Au
26-28	as above, FeO along Joints.	0.1	26-30	248 (C)	150 / 14	17 / 28	92 / 13	20 / 6
28-30	as above.	0.1						
30-32	as above, some gr sandy layers.	0.1	30-36	249	66 / 16	15 / 22	100 / 10	10 / 2
32-34	as above. (MF)	0.1						
34-36	as above.	0.1						
36-38	dark gr weakly lam. shale. EOH 38 m	0.1	36-38	250 (M)	38 / 10	9 / 13	13 / 11	5 / 1

HOLE NO: TER 3

100 000 SHEET NO: 6631

TRAVERSE: 3068 E STATION: 2000 E

LOCATION: 306430 E
6334300 N

DATE DRILLED: 17/2/93

DRILLING METHOD: RC

LOGGED BY: B J MORRIS

TOTAL DEPTH: 17 m

Depth Interval (m)	Lithology	MS	Sample Interval (m)	Sample No-RS	Selected Analyses (ppm except Au, ppb) Cu / Cr	Pb / Ni	Zn / Nb	Co / Au
0-2	r-b sandy clay, calcrete and lat pebs.	1.6						
2-4	pale b sandy clay with lat and calcrete pebs.	3.2						
4-6	as above plus w lmst.	0.6						
6-8	pale b sandy silty-clay with qtz and shale pebs.	0.4						
8-10	y-b clay with gr calc shale pebs.	0.1						
10-12	gr siltst, and off-w calc siltst (HW).	0.5	10-14	251	19 / 10	11 / 11	48 / 3	8 / -
12-14	dark gr shale, mica partings with white calc. siltst layers (W).	0.1						
14-16	thin lam, dark gr shale (MF).	0.1	14-16	252	18 / 9	8 / 9	56 / 4	6 / 1
16-17	as above some off-w calc siltst layers.	0.1	16-17	253 (M)	18 / 17	14 / 15	45 / 6	7 / 1
	EOH 17m							

HOLE NO: TER 4

100 000 SHEET NO: 6631

TRAVERSE: 3068 E STATION: 1500 N

LOCATION: 306520 E
6333900 N

DATE DRILLED: 17/2/93

DRILLING METHOD: RC

LOGGED BY: B J MORRIS

TOTAL DEPTH: 26 m

Depth Interval (m)	Lithology	MS	Sample Interval (m)	Sample No-RS	Selected Analyses (ppm except Au, ppb) Cu / Pb / Zn / Co / Cr / Ni / Nb / Au
0-2	r-b silt-clay minor qtz pebs.	4.6			
2-4	as above, weakly calc, pebs of qtz, sandst, shale.	2.4			
4-6	pale b clay, weakly calc minor hm patches, some lat. pebs.	0.4			
6-8	pale b and w clay, pebs calc siltst and qtz.	0.5			
8-10	as above some hm patches and FeO pebs.	0.7			
10-12	b clay with pebs of b-y shale, qtz, qtzite and calc. siltst.	2.5			
12-14	as above plus FeO pebs.	0.8			
14-16	as above.	3.0			
16-18	pale grey shale, mica partings, weak calc. (HW).	4.0			
18-20	as above.	0.1	18-20	254 (C)	105 / 8 / 55 / 16 / 16 / 28 / 13 / 5
20-22	gr shale and gr-g spotted siltst, spots of FeO after carbonate or pyrite (W).	0.1	20-22	255	72 / 7 / 40 / 14 / 15 / 26 / 13 / 5
22-24	interlayered ferrug sandst, black shale and spotted siltst (MF).	0.1	22-24	256	82 / 7 / 58 / 76 / 14 / 32 / 11 / 1
24-26	dark gr siltst with mica partings. EOH 26 m	0.1	24-26	257 (M)	54 / 8 / 20 / 18 / 15 / 24 / 15 / 2

HOLE NO: TER 5

100 000 SHEET NO: 6631

TRAVERSE: 3068 E STATION: 1020 N

LOCATION: 306630 E
6333415 N

DATE DRILLED: 18/2/93

DRILLING METHOD: RC

LOGGED BY: B J MORRIS

TOTAL DEPTH: 26 m

Depth Interval (m)	Lithology	MS	Sample Interval (m)	Sample No-RS	Selected Analyses (ppm except Au, ppb) Cu / Cr	Pb / Ni	Zn / Nb	Co / Au
0-2	r-b clay, with pebs of shale, lat, calcrete and qtz.	3.9						
2-4	as above.	1.9						
4-6	b silt-clay, pebs of FeO and calc siltst.	1.2						
6-8	w-gr-y mottled clay weakly calc.	0.3						
8-10	gr-rb clay with pebs of FeO.	0.9						
10-12	y-b silt clay with chips of pale b siltst. (HW).	0.1	10-14	258	38 / 22	36 / 32	65 / 9	16 / 3
12-14	as above.	0.1						
14-16	b. siltst and shale in y-b clay.	0.1	14-18	259 (C)	105 / 44	30 / 45	84 / 12	34 / 26
16-18	6. siltst, thinly lam (W).	0.1						
18-20	gr-g shale, siltst with mica partings.	0.1	18-22	260 (C)	135 / 28	12 / 30	110 / 14	13 / 11
20-22	as above.	0.1						
22-24	pale b fine sandst and siltst (MF)	0.1	22-24	261	19 / 28	10 / 24	90 / 14	12 / 12
24-26	gr siltst, thinly lam. mica partings.	0.1	24-26	262 (M)	11 / 38	5 / 26	22 / 13	10 / 2
	EOH 26 m							

HOLE NO: TER 6

100 000 SHEET NO: 6631

TRAVERSE: 3068 E STATION: 500 N

LOCATION: 306700 E
6332910 N

DATE DRILLED: 18/2/93

DRILLING METHOD: RC

LOGGED BY: B J MORRIS

TOTAL DEPTH: 62 m

Depth Interval (m)	Lithology	MS	Sample Interval (m)	Sample No-RS	Selected Analyses (ppm except Au, ppb) Cu / Cr	Pb / Ni	Zn / Nb	Co / Au
0-2	r-b clay with pebs of lat and qtz.	2.9						
2-4	gr-b calc. clay with FeO pebs.	0.3						
4-6	gr-b mottled calc silt-clay with patches of hm.	0.2						
6-8	gr-b-y mottled clay with calcrete and FeO pebs.	2.3						
8-10	b-y calc-siltst with FeO veinlets in y-b clay. (HW).	0.1						
10-12	y-b calc-siltst plus FeO frags.	0.1	10-20	263	38 / 9	9 / 16	22 / 10	8 / 1
12-14	b-y siltst.	0.1						
14-16	as above.	0.1						
16-18	y-b siltst, fine sandst. with FeO veinlets (2-5 mm)	0.1						
18-20	as above	0.1						
20-22	as above, minor vein qtz	0.1	20-28	264	55 / 6	7 / 7	12 / 22	5 / -
22-24	as above. H.W. some kaolin clay	0.1						
24-26	as above.	0.1						
26-28	as above.	0.1						
28-30	H.W. y-w fine sandst minor FeO and qtz veinlets.	0.1	28-40	265	62 / 12	6 / 6	12 / 10	- / -

TER 6 (Cont.)

Depth Interval (m)	Lithology	MS	Sample Interval (m)	Sample No-RS	Selected Analyses (ppm except Au, ppb) Cu / Cr / Pb / Ni / Zn / Nb / Co / Au
30-32	as above.	0.1			
32-34	as above.	0.1			
34-36	as above.	0.1			
36-38	b sandst, partly ferruginous (W).	0.1			
38-40	pale b thinly lam fine sandst.	0.1			
40-42	as above with gr vein qtz.	0.1	40-42	266	35 / 9 / 9 / 3 / 7 / 14 / - / -
42-44	pale to fine sandst minor vein qtz.	0.1	42-50	267	28 / 4 / 4 / 8 / 12 / 10 / 3 / -
44-46	as above, some FeO veinlets.	0.1			
46-48	as above.	0.1			
48-50	y-b siltst some qtz and FeO veinlets.	0.1			
50-52	pale b fine sandst with vein qtz.	0.1	50-54	268	14 / 4 / 11 / 4 / 30 / 14 / 2 / 2
52-54	as above.	0.1			
54-56	off w sandst and b ferrug sandst (MF).	0.2	54-56	269	24 / 2 / - / 8 / 28 / 5 / 2 / -
56-58	y-gr med. sandst. with coarse muscovite and kaolin.	0.1	56-60	270	19 / 2 / 10 / 6 / 24 / 5 / 3 / -
58-60	as above.	0.1			
60-62	y-w sandst, veinlets of FeO.	0.1	60-62	271 (M)	62 / 4 / 7 / 6 / 18 / 13 / 2 / 1
	EOH 62 m				

HOLE NO: TER 7

100 000 SHEET NO: 6631

TRAVERSE: 3068 E STATION: 00 N

LOCATION: 306807 E
6332435 N

DATE DRILLED: 18/2/93

DRILLING METHOD: RC

LOGGED BY: B J MORRIS

TOTAL DEPTH: 51 m

Depth Interval (m)	Lithology	MS	Sample Interval (m)	Sample No-RS	Selected Analyses (ppm except Au, ppb) Cu / Pb / Zn / Co / Cr / Ni / Nb / Au
0-2	r-b silt clay with calcrete and FeO pebs.	1.7			
2-4	b silt clay, pebs of calcreted fine sandst.	0.3			
4-6	b-gr mottled clay.	0.1			
6-8	as above some hm patches.	0.4			
8-10	as above.	0.1			
10-12	as above with FeO pebs.	0.1			
12-14	as above.	0.3			
14-16	r-b mottled silt clay with gr, ferrug, sandst pebs.	0.3			
16-18	as above some dark b shale frags.	2.3			
18-20	w kaolin clay some grey vein qtz pebs (HW).	0.0	18-24	272	36 / 5 / 14 / - / 6 / 3 / 19 / -
20-22	w-gr kaolin clay some fine biotite.	0.0			
22-24	off w kaolin clay with vein qtz pebs.	0.0			
24-26	as above.	0.0	24-30	273	38 / 9 / 12 / - / 5 / 3 / 12 / -
26-28	as above with frags of gr cherty qtz.	0.1			
28-30	as above with vugs, some cubic in gr glassy vein qtz.	0.1			

TER 7 (Cont.)

Depth Interval (m)	Lithology	MS	Sample Interval (m)	Sample No-RS	Selected Analyses (ppm except Au, ppb) Cu / Cr	Pb / Ni	Zn / Nb	Co / Au
30-32	gr-y clay with qtz pebs.	0.0	30-38	274	90 / 12	7 / 6	10 / 15	2 / -
32-34	as above.	0.0						
34-36	as above.	0.0						
36-38	pale y clay with gr vein qtz frags,	0.0						
38-40	as above with some sandst frags.	0.0	38-42	275	44 / 5	7 / 7	22 / 7	4 / 4
40-42	off w clay, vuggy vein qtz, frag of silcrete?	0.0						
42-44	off w clay with cherty qtz frags and pink WBR:	0.0	42-46	276 (C)	105 / 5	10 / 12	15 / 5	5 / 3
44-46	coarse qtz sand with vuggy chert frags.	0.0						
46-48	coarse sandst and vuggy chert frags.	0.0	46-50	277 (C)	110 / 4	8 / 38	32 / 2	16 / 3
48-50	As above.	0.1						
50-51	coarse sandst, partly ferrug and gr vuggy chert frags (MF).	1.7	50-51	278	28 (M)	8 / 6	15 / 16	190 / - 2
	EOH 51 m							

HOLE NO: TER 8

100 000 SHEET NO: 6631

TRAVERSE: 3040 E STATION: 10 N

LOCATION: 303984 E
6329158 N

DATE DRILLED: 19/2/93

DRILLING METHOD: RC

LOGGED BY: B J MORRIS

TOTAL DEPTH: 14 m

Depth Interval (m)	Lithology	MS	Sample Interval (m)	Sample No-RS	Selected Analyses (ppm except Au, ppb) Cu / Cr	Pb / Ni	Zn / Nb	Co / Au
0-2	b silty calc. clay with gr-g siltst and qtz pebs.	0.1						
2-4	gr-g siltst, minor vein qtz. (HW).	0.1	2-6	279	55 / 16	6 / 24	38 / 12	15 / 4
4-6	as above with qtz pebs tillite?	0.1						
6-8	as above.	0.1	6-10	280 (C)	36 / 13	9 / 16	52 / 8	13 / 10
8-10	gr-y-b siltst with qtz pebs, tillite? (W)	0.2						
10-12	b siltst with qtz pebs tillite?	0.2	10-12	281	36 / 11	12 / 16	68 / 8	12 / 4
12-14	as above. (MF)	0.1	12-14	282 (M)	30 / 11	13 / 17	52 / 9	12 / 1
	EOH 14 m							

HOLE NO: TER 9

100 000 SHEET NO: 6631

TRAVERSE: 3040 E STATION: 450 N

LOCATION: 303751 E
6329598 N

DATE DRILLED: 19/2/93

DRILLING METHOD: RC

LOGGED BY: B J MORRIS

TOTAL DEPTH: 20 m

Depth Interval (m)	Lithology	MS	Sample Interval (m)	Sample No-RS	Selected Analyses (ppm except Au, ppb) Cu / Cr	Pb / Ni	Zn / Nb	Co / Au
0-2	r-b silt-clay minor qtz and FeO grains.	4.1						
2-4	pale gr clay, minor qtz pebs.	3.3						
4-6	as above.	1.3						
6-8	gr clay with siltst and sandst frags.	0.6						
8-10	gr-y-b siltst with Mn-hm along joints (HW).	0.2	8-12	283	74 / 22	7 / 88	175 / 13	58 / 3
10-12	gr-g siltst, some vein qtz.	0.4						
12-14	as above. (W)	0.1	12-14	284	42 / 19	5 / 58	230 / 15	44 / 4
14-16	gr-g siltst with mica partings. (MF)	0.1	14-16	285	40 / 22	7 / 78	185 / 15	42 / 4
16-18	as above.	0.1	16-18	286	30 / 20	7 / 62	150 / 15	26 / 3
18-20	as above.	0.0	18-20	287 (M)	28 / 19	6 / 56	145 / 13	16 / 1
	EOH 20 m							

HOLE NO: TER 10

100 000 SHEET NO: 6631

TRAVERSE: 3040 E STATION: 1000 N

LOCATION: 303480 E
6330148 N

DATE DRILLED: 19/2/93

DRILLING METHOD: RC

LOGGED BY: B J MORRIS

TOTAL DEPTH: 32 m

Depth Interval (m)	Lithology	MS	Sample Interval (m)	Sample No-RS	Selected Analyses (ppm except Au, ppb) Cu / Cr	Pb / Ni	Zn / Nb	Co / Au
0-2	r-b clay with shale, FeO and qtz pebs.	3.4						
2-4	as above.	1.4						
4-6	y-b clay with frags of b siltst, weakly calc.	0.1						
6-8	as above (HW).	0.1	6-16	288 (C)	44 / 35	12 / 76	74 / 14	24 / 7
8-10	as above.	0.1						
10-12	as above.	0.1						
12-14	as above, some FeO veinlets.	0.1						
14-16	b-gr-g siltst, 1 cm layers mica partings on clearage.	0.1						
16-18	as above.	0.1	16-20	289 (C)	34 / 40	22 / 190	260 / 14	84 / 3
18-20	as above some FeO along joints.	0.1						
20-22	gr-g siltst	0.1	20-24	290 (C)	38 / 46	11 / 120	490 / 14	15 / 7
22-24	as above.	0.1						
24-26	as above. (W)	0.1	24-28	291	36 / 28	15 / 68	240 / 34	19 / 7
26-28	as above.	0.1						
28-30	as above.	0.1	28-30	292	34 / 38	10 / 50	96 / 16	17 / 3
30-32	gr-g siltst, mica partings, some FeO along joints (MF). EOH 32 m	0.1	30-32	293 (H)	32 / 38	12 / 40	105 / 16	17 / -

HOLE NO: TER 11

100 000 SHEET NO: 6631

TRAVERSE: 3040 E STATION: 1500 N

LOCATION: 303211 E
6330648 N

DATE DRILLED: 19/2/93

DRILLING METHOD: RC

LOGGED BY: B J MORRIS

TOTAL DEPTH: 20 m

Depth Interval (m)	Lithology	MS	Sample Interval (m)	Sample No-RS	Selected Analyses (ppm except Au, ppb) Cu / Cr	Pb / Ni	Zn / Nb	Co / Au
0-2	r-b silt-clay with FeO pebs.	5.0						
2-4	y-g-b silt clay with y-b siltst frags (HW).	0.1						
4-6	as above.	0.1	4-8	294	64 / 28	34 / 75	230 / 13	30 / 3
6-8	as above.	0.1						
8-10	as above.	0.1	8-12	295	68 / 24	24 / 54	310 / 13	25 / 4
10-12	y-b siltst with some spec. hm along joints.							
12-14	as above.	0.1	12-16	296 (C)	42 / 34	24 / 40	200 / 12	16 / 3
14-16	as above.	0.1						
16-18	as above.	0.1	16-18	297	44 / 32	22 / 36	110 / 12	11 / 3
18-20	gr-gr siltst-shale (MF)	0.1	18-20	298	28 / 32	15 / 40	62 / 13	13 / -
	EOH 20 m							

HOLE NO: TER 12

100 000 SHEET NO: 6631

TRAVERSE: 3052 E STATION: 00 N

LOCATION: 308921 E
6325453 N

DATE DRILLED: 19/2/93

DRILLING METHOD: RC

LOGGED BY: B J MORRIS

TOTAL DEPTH: 50 m

Depth Interval (m)	Lithology	MS	Sample Interval (m)	Sample No-RS	Selected Analyses (ppm except Au, ppb) Cu / Cr / Pb / Ni / Zn / Nb / Co / Au
0-2	r-b, calc silt clay with qtz and FeO pebs.	4.5			
2-4	as above.	1.6			
4-6	as above.	0.3			
6-8	pale y-b clay with chips of fine-med. sandst with FeO-Mn. (HW)	0.1	6-14	299	32 / 38 / 11 / 100 / 50 / 19 / 270 / 6
8-10	w-y fine sandst (W).	0.1			
10-12	as above with FeO along joints.	1.7			
12-14	as above with siltst interbeds.	0.1			
14-16	as above plus frags of b-g kimberlite (HW).	2.4	14-16	300 (S,M)	52 / 280 / 26 / 590 / 115 / 84 / 115 / 26
16-18	b-g kimberlite and gr-b clay.	1.8	16-18	301 (S,M,C)	62 / 310 / 46 / 570 / 120 / 92 / 80 / 42
18-20	pale b siltst-shale (W).	0.1	18-26	302	30 / 60 / 11 / 175 / 50 / 28 / 25 / 4
20-22	gr shale with y FeO along joints.	0.3			
22-24	gr-g siltst-shale.	0.1			
24-26	gr siltst-shale, b fine sandst and gr-g clay silt.	0.4			
26-28	gr-g siltst, minor vein qtz.	0.1	26-30	303	46 / 52 / 13 / 100 / 24 / 14 / 19 / 4
28-30	As above to 29 m then bl siltst.	0.1			

TER 12 (Cont.)

Depth Interval (m)	Lithology	MS	Sample Interval (m)	Sample No-RS	Selected Analyses (ppm except Au, ppb) Cu / Cr / Pb / Ni / Zn / Nb / Co / Au
30-32	bl shale and dark g kimberlite.	2.4	30-32	304 (P,S,M)	65 / 210 / 19 / 700 / 44 / 72 / 76 / 6
32-34	b siltst-shale and minor b-g kimberlite.	0.6	32-40	305 (S,C,M)	15 / 56 / 11 / 58 / 10 / 17 / 15 / 3
34-36	B siltst some vein qtz.	0.1			
36-38	As above.	0.1			
38-40	gr fine sandst and b siltst.	0.1			
40-42	as above minor vein qtz. (MF)	0.1	40-46	306 (C)	26 / 34 / 5 / 38 / 20 / 14 / 17 / 3
42-44	as above.	0.1			
44-46	gr-b fine sandst, b siltst-shale and pink - w cherty vein qtz.	0.1			
46-48	as above.	0.1	46-48	307	30 / 28 / 4 / 24 / 20 / 15 / 8 / 3
48-50	b sandst and siltst	0.1	48-50	308 (M)	17 / 34 / 5 / 16 / 20 / 16 / 10 / 4
	EOH 50 m				

HOLE NO: TER 13

100 000 SHEET NO: 6631

TRAVERSE: 3052 E STATION: 500 N

LOCATION: 305417 E
6328184 N

DATE DRILLED: 20/2/93

DRILLING METHOD: RC

LOGGED BY: B J MORRIS

TOTAL DEPTH: 68 m

Depth Interval (m)	Lithology	MS	Sample Interval (m)	Sample No-RS	Selected Analyses (ppm except Au, ppb) Cu / Cr	Pb / Ni	Zn / Nb	Co / Au
0-2	r-b clay, calcrete, with FeO, shale and qtz pebs.	3.0						
2-4	b calc silt-clay with shale, qtz FeO and sandst pebs.	2.5						
4-6	as above.	2.4						
6-8	as above.	3.0						
8-10	pale gr-g silt clay some chips of fine weakly calc. fine sandst (HW).	0.2						
10-12	y-b siltst-sandst with FeO along fractures.	0.1	10-20	309	26 / 15	5 / 12	16 / 14	8 / -
12-14	as above.	0.0						
14-16	as above, minor blue-gr vein qtz.	0.1						
16-18	Off w siltst-fine sandst in y-w clay.	0.0						
18-20	as above with blue-gr vein qtz.	0.0						
20-22	as above.	0.0	20-30	310	15 / 16	13 / 10	15 / 17	4 / -
22-24	as above.	0.1						
24-26	siltst with some FeO frags.	0.0						
26-28	w-y clay and siltst frags, minor fine sandst.	0.0						
28-30	as above.	0.0						

TER 13 (Cont.)

Depth Interval (m)	Lithology	MS	Sample Interval (m)	Sample No-RS	Selected Analyses (ppm except Au, ppb) Cu / Cr	Pb / Ni	Zn / Nb	Co / Au
30-32	as above plus blue-gr vein qtz and FeO frags. (W)	0.1	30-40	311	13 / 11	8 / 9	12 / 14	3 / 1
32-34	as above.	0.1						
34-36	off w fine sandst some vein qtz chips.	0.0						
36-38	as above.	0.1						
38-40	as above plus FeO frags.	0.1						
40-42	off w siltst minor vein qtz.	0.1	40-44	312 (C)	36 / 14	8 / 14	15 / 20	3 / 3
42-44	y-g siltst (HW)	0.1						
44-46	gr-g fine sandst with silt-shale interbeds. (W)	0.1	44-54	313 (C)	15 / 42	7 / 32	34 / 16	10 / 3
46-48	as above.	0.1						
48-50	as above minor spec-hm.	0.1						
50-52	as above with glassy vuggy vein qtz.	0.1						
52-54	gr-g fine sandst with b siltst layers minor vein qtz.	0.1						
54-56	as above.	0.1	54-64	314	11 / 42	13 / 48	68 / 16	18 / 5
56-58	as above.	0.2						
60-62	as above.	0.2						
62-64	gr-g siltst - shale with minor vein qtz.	0.2						
64-66	as above.	0.1	64-66	315	32 / 44	11 / 32	44 / 16	9 / 7
66-68	gr-g plus y-b siltst minor fine sandst interbeds, some FeO frags. EOH 68 m	0.1	66-68	316 (M)	22 / 32	8 / 20	20 / 16	5 / 7

HOLE NO: TER 14 100 000 SHEET NO: 6631

TRAVERSE: 3052 E STATION: 700 N LOCATION: 350502 E 6328382 N

DATE DRILLED: 20/2/93

DRILLING METHOD: RC

LOGGED BY: B J MORRIS TOTAL DEPTH: 32 m

Depth Interval (m)	Lithology	MS	Sample Interval (m)	Sample No-RS	Selected Analyses (ppm except Au, ppb) Cu / Pb / Zn / Co / Cr / Ni / Nb / Au
0-2	r-b clay soil, calc., some FeO and shale pebs.	2.67			
2-4	pale b clay, minor pebs.	1.08			
4-6	b clay, weakly calc., minor fine sandst pebs.	1.05			
6-8	as above.	0.05			
8-10	white and orange fine sandst, shale interbeds. (HW)	0.04	8-16	317 (C)	8 / 5 / 30 / 3 / 44 / 13 / 17 / 22
10-12	pale pink clay silt minor vein qtz.	0.02			
12-14	pale y w siltst some FeO chips.	0.03			
14-16	pink-y-w, W siltst	0.04			
16-18	as above with minor vein qtz and FeO.	0.04	16-24	318	11 / 12 / 54 / 7 / 18 / 20 / 12 / 4
18-20	pale b, fine, sandst. some FeO chips. (W)	0.03			
20-22	as above.	0.02			
22-24	as above plus chips of vein qtz.	0.04			
24-26	as above.	0.03	24-28	319	7 / 7 / 14 / 7 / 9 / 11 / 5 / <1
26-28	as above.	0.13			
28-30	pale b, sandst with chips of FeO and vein qtz, some shale interbeds. (MF)	0.09	28-30	320	8 / 8 / 17 / 9 / 10 / 11 / 4 / 1

TER 14 (Cont.)

Depth Interval (m)	Lithology	MS	Sample Interval (m)	Sample No-RS	Selected Analyses (ppm except Au, ppb) Cu	Pb	Zn	Co	Cr	Ni	Nb	Au
30-32	as above. EOH 32 m	0.04	30-32	321 (M)	6	10	9	7	10	12	5	<1

HOLE NO: TER 15

100 000 SHEET NO: 6631

TRAVERSE: 3052 E STATION: 1000 N

LOCATION: 305613 E
6328673 N

DATE DRILLED: 20/2/93

DRILLING METHOD: RC

LOGGED BY: B J MORRIS

TOTAL DEPTH: 95 m

Depth Interval (m)	Lithology	MS	Sample Interval (m)	Sample No-RS	Selected Analyses (ppm except Au, ppb) Cu / Cr / Pb / Ni / Zn / Nb / Co / Au
0-2	calc soil on off-w, W fine sandst.	0.04	0-14	322	6 / 5 / 5 / 6 / 6 / 8 / 3 / 4
2-4	off-w, siltst.	0.05			
4-6	siltst and b silt-clay (W)	0.04			
6-8	fine off-w sandst.	0.11			
8-10	fine sandst and shale.	0.02			
10-12	as above, layering 45° to core.	0.01			
12-14	sandst and siltst	0.02			
14-16	off-w clay with sandst and siltst. (HW)	0.01	14-24	323	13 / 10 / 7 / 16 / 32 / 17 / 4 / <1
16-18	as above.	0.02			
18-20	as above.	0.03			
20-22	pale-b silt-clay.	0.03			
22-24	as above.	0.04			
24-26	as above.	0.03	24-34	324	11 / 16 / 4 / 10 / 12 / 15 / 5 / <1
26-28	as above.	0.03			
28-30	as above minor vein qtz chips.	0.03			
30-32	pale y-b silt-clay and fine sandst chips.	0.03			
32-34	as above some vein qtz chips.	0.02			

TER 15 (Cont.)

Depth Interval (m)	Lithology	MS	Sample Interval (m)	Sample No-RS	Selected Analyses (ppm except Au, ppb) Cu / Cr	Pb / Ni	Zn / Nb	Co / Au
34-36	as above.	0.07	34-44	325	19 / 30	6 / 12	6 / 20	7 / <1
36-38	pale pink silt-clay.	0.02						
38-40	as above.	0.04						
40-42	as above.	0.06						
42-44	as above.	0.07						
44-46	as above.	0.05	44-54	326	20 / 25	6 / 10	4 / 22	11 / <1
46-48	b silt-clay.	0.06						
48-50	as above plus (HW), shale and siltst frags.	0.08						
50-52	as above.	0.06						
52-54	as above.	0.06						
54-56	as above.	0.06	54-58	327	18 / 76	3 / 14	7 / 19	10 / <1
56-58	as above plus chips of siltst and fine sandst.	0.04						
58-60	b, silt-clay with chips of b siltst some FeO chips.	0.07	58-62	328	15 / 35	3 / 35	13 / 18	60 / <1
60-62	as above with chips of vein qtz plus FeO.	0.07						
62-64	b fine sandst and gr-g shale.	.06	62-72	329	13 / 42	4 / 30	28 / 17	17 / <1
64-66	as above.	0.07						
66-68	as above.	0.07						
68-70	gr-b clay some siltst and sandst chips.	0.10						
70-72	y-gr-b siltst (W) minor vein qtz chips.	0.07						
72-74	as above.	0.02	72-80	330	15	4	13	8
74-76	as above.	0.15						

TER 15 (Cont.)

Depth Interval (m)	Lithology	MS	Sample Interval (m)	Sample No-RS	Selected Analyses (ppm except Au, ppb) Cu / Cr / Pb / Ni / Zn / Nb / Co / Au
76-78	as above.	0.00			
78-80	as above.	0.09			
80-82	gr-g siltst in clay.	0.10	80-86	331	10 / 17 / 4 / 22 / 13 / 17 / 11 / <1
82-84	as above.	0.12			
84-86	y siltst and b fine sandst, minor vein qtz.	0.14			
86-88	as above.	0.07	86-90	332	5 / 15 / 4 / 9 / 4 / 19 / 3 / <1
88-90	as above.	0.08			
90-92	siltst and fine sandst.	0.04	90-94	333	9 / 13 / 6 / 20 / 22 / 20 / 16 / 1
92-94	fine sandst, minor vein qtz, W siltst.	0.02			
94-95	as above. (MF) EOH 95 m	0.16	94-95	334 (M)	12 / 7 / 7 / 25 / 24 / 15 / 17 / 1

HOLE NO: TER 16

100 000 SHEET NO: 6631

TRAVERSE: 3052 E STATION: 1500 E

LOCATION: 305721 E
6329190 N

DATE DRILLED: 21/2/93

DRILLING METHOD: RC

LOGGED BY: B J MORRIS

TOTAL DEPTH: 29 m

Depth Interval (m)	Lithology	MS	Sample Interval (m)	Sample No-RS	Selected Analyses (ppm except Au, ppb) Cu / Pb / Zn / Co / Cr / Ni / Nb / Au
0-2	r-b clay soil, some qtz, FeO and sandst pebs.	1.37			
2-4	b silt clay with chips of y-p siltst and FeO chips. (HW)	0.08			
4-6	as above.	0.05	4-10	335	9 / <3 / 7 / <2 / 16 / 5 / 18 / <1
6-8	as above.	0.02			
8-10	gr-p sandst and siltst at 9 m qtz vein with FeO.	0.04			
10-12	gr-p siltst and fine sandst.	0.04	10-16	336	9 / <3 / 9 / <2 / 18 / 5 / 18 / 2
12-14	as above, FeO chips.	0.04			
14-16	as above.	0.04			
16-18	w fine-med. sandst some 0.5 cm qtz veins. (W)	0.02	16-22	337	3 / 3 / 4 / <2 / 3 / 3 / 10 / <1
18-20	as above.	0.00			
20-22	fine sandst and siltst with stockwork of FeO veinlets.	0.02			
22-24	as above some qtz vein chips.	0.02	22-28	338	3 / 3 / 3 / 3 / 3 / 2 / 11 / <1
24-26	as above.	0.02			
26-28	as above. (MF)	0.03			
28-29	off-w sandst and siltst with stockwork of FeO veinlets and chips of vein and chips of vein qtz. EOH 29 m	0.02	28-29	339 (M)	6 / 8 / 4 / 7 / 6 / 2 / 7 / 1

HOLE NO: TER 17

100 000 SHEET NO: 6631

TRAVERSE: 3089 E STATION: 500 E

LOCATION: 308894 E
6325921 N

DATE DRILLED: 21/2/93

DRILLING METHOD: RC

LOGGED BY: B J MORRIS

TOTAL DEPTH: 26 m

Depth Interval (m)	Lithology	MS	Sample Interval (m)	Sample No-RS	Selected Analyses (ppm except Au, ppb) Cu / Cr	Pb / Ni	Zn / Nb	Co / Au
0-2	r-b silt-clay.	1.67						
2-4	g-gr-y silt-clay.	0.78						
4-6	as above.	0.57						
6-8	b-gr clay.	0.16						
8-10	as above.	0.54						
10-12	p-b fine sandst and siltst. (HW)	0.08	10-16	340	28 / 28	13 / 24	46 / 13	10 / 1
12-14	as above.	0.04						
14-16	fine sandst and siltst/shale. (W)	0.04						
16-18	as above.	0.03	16-20	341	44 / 28	20 / 34	94 / 16	17 / <1
18-20	g-y-b silty sandst, siltst and shale.	0.03						
20-22	p-b fine sandst, siltst and shale.	0.05	20-24	342	52 / 34	20 / 35	92 / 15	19 / <1
22-24	as above. (MF)	0.06						
24-26	as above. EOH 26 m	0.05 (M)	24-26	343	84 / 35	22 / 52	190 / 16	24 / 2

HOLE NO: TER 18

100 000 SHEET NO: 6631

TRAVERSE: 3089 E STATION: 850 E

LOCATION: 30 8969 E
6329421 N

DATE DRILLED: 21/2/93

DRILLING METHOD: RC

LOGGED BY: B J MORRIS

TOTAL DEPTH: 53 m

Depth Interval (m)	Lithology	MS	Sample Interval (m)	Sample No-RS	Selected Analyses (ppm except Au, ppb) Cu / Cr	Pb / Ni	Zn / Nb	Co / Au
0-2	r-b clay	1.57						
2-4	b-gr clay	0.41						
4-6	as above.	0.11						
6-8	as above.	0.03						
8-10	gr and r-b clay.	0.29						
10-12	as above.	0.61						
12-14	gr clay minor FeO pebs.	0.78						
14-16	gr-y clay, FeO pebs.	9.95						
16-18	b siltst and fine sandst. (HW)	0.10	16-24	344	115 / 40	19 / 30	45 / 14	10 / <1
18-20	as above.	0.10						
20-22	p-b clay, kaolinitic siltst and claystone.	0.11						
22-24	as above.	0.07						
24-26	as above.	0.05						
26-28	as above.	0.09	26-36	345 (C)	42 / 25	18 / 50	70 / 17	35 / 4
28-30	as above.	0.05						
30-32	as above.	0.07						
32-34	as above, trace FeO chips.	0.06						
34-36	y-b clay, chips of W y-b siltst.	0.04						
36-38	as above.	0.07	36-42	346 (C)	35 / 32	9 / 92	170 / 16	74 / <1

TER 18 (Cont.)

Depth Interval (m)	Lithology	MS	Sample Interval (m)	Sample No-RS	Selected Analyses (ppm except Au, ppb) Cu / Cr	Pb / Ni	Zn / Nb	Co / Au
38-40	as above, minor chips of FeO.	0.09						
40-42	g-b-y siltst chips some some FeO chips.	0.18						
42-44	as above.	0.08	42-48	347	38 / 30	8 / 90	240 / 15	54 / 2
44-46	gr-g siltst some FeO chips. (W)	0.09						
46-48	as above.	0.08						
48-50	as above.	0.08	48-52	348	34 / 30	8 / 70	250 / 15	54 / <1
50-52	as above. (MF)	0.14						
52-53	gr-g siltst. EOH 53 m	0.08	52-53	349 (M)	40 / 32	5 / 74	220 / 17	32 / 1

HOLE NO: TER 19

100 000 SHEET NO: 6631

TRAVERSE: 3089 E STATION: 1300 N

LOCATION: 309107 E
6326677 N

DATE DRILLED: 21/2/93

DRILLING METHOD: RC

LOGGED BY: B J MORRIS

TOTAL DEPTH: 50 m

Depth Interval (m)	Lithology	MS	Sample Interval (m)	Sample No-RS	Selected Analyses (ppm except Au, ppb) Cu / Pb / Zn / Co / Cr / Ni / Nb / Au
0-2	r-b clay.	1.89			
2-4	g-gr-b clay.	0.27			
4-6	as above.	0.22			
6-8	as above.	0.12			
8-10	as above.	0.82			
10-12	as above, some FeO pebs.	0.20			
12-14	gr-b clay with FeO and shale pebs.	1.99			
14-16	as above. (lots of FeO pebs)	22.8	14-18	350	58 / 70 / 28 / 18 / 190 / 32 / 11 / <1
16-18	as above.	27.8			
18-20	off white clay. (HW)	3.07	18-28	351	58 / 13 / 98 / 9 / 38 / 32 / 15 / <1
20-22	y-w clay with chips of b-y siltst.	0.10			
22-24	as above.	0.06			
24-26	gr-off white clay.	0.06			
26-28	b clay, chips of b-y siltst.	0.10			
28-30	as above.	0.07	28-38	352	65 / 28 / 250 / 16 / 38 / 68 / 15 / <1
30-32	as above.	0.10			
32-34	as above.	0.06			
34-36	as above.	0.07			

TER 19 (Cont.)

Depth Interval (m)	Lithology	MS	Sample Interval (m)	Sample No-RS	Selected Analyses (ppm except Au, ppb) Cu / Cr	Pb / Ni	Zn / Nb	Co / Au
36-38	pale b clay with chips of g-y siltst, trace vein qtz.	0.08						
38-40	pink-r-b clay minor siltst chips.	0.05	38-42	353	40 / 30	24 / 34	125 / 14	11 / <1
40-42	b clay with b-g siltst chips.	0.06						
42-44	gr-g siltst. (W)	0.07	42-46	354	38 / 35	26 / 60	260 / 13	20 / 1
44-46	as above, trace of vein qtz.	0.07						
46-48	gr-g siltst. (MF)	0.09	46-48	355	28 / 38	12 / 54	130 / 13	20 / 2
48-50	gr-g siltst. EOH 50 m	0.07	48-50	356 (M)	32 / 38	8 / 52	110 / 14	20 / 2

HOLE NO: TER 20

100 000 SHEET NO: 6631

TRAVERSE: 3231 N STATION: 00 E

LOCATION: 306681 E
6323120 N

DATE DRILLED: 22/2/93

DRILLING METHOD: RC

LOGGED BY: B J MORRIS

TOTAL DEPTH: 53 m

Depth Interval (m)	Lithology	MS	Sample Interval (m)	Sample No-RS	Selected Analyses (ppm except Au, ppb) Cu Pb Zn Co Cr Ni Nb Au
0-2	r-b calc. silt-clay with FeO and shale pebs.	2.56			
2-4	as above.	3.14			
4-6	as above.	1.32			
6-8	as above.	2.11			
8-10	r-b silt-clay with shale and FeO Pebs.	1.22			
10-12	as above.	1.66			
12-14	b-gr clay.	1.86			
14-16	b-r clay, pebs of vein qtz, sandst and shale.	2.02			
16-18	as above.	2.89			
18-20	clay with siltst, shale and FeO pebs.	4.94			
20-22	as above.	6.56			
22-24	r-b clay with FeO and shale pebs.	2.03			
24-26	as above.	2.26			
26-28	as above.	3.13			
28-30	r-b and gr mottled clay with shale and FeO pebs.	1.04			
30-32	as above.	2.44			
32-34	as above.	1.83			
34-36	gr-y clay with r, shale and qtz chips.	4.62			

TER 20 (Cont.)

Depth Interval (m)	Lithology	MS	Sample Interval (m)	Sample No-RS	Selected Analyses (ppm except Au, ppb) Cu / Cr	Pb / Ni	Zn / Nb	Co / Au
36-38	gr-y clay with chips of g shale (HW).	0.12	36-46	357	48 / 19	9 / 30	58 / 14	13 / 22
38-40	gr-y-g siltst and shale in g-y clay.	1.14						
40-42	y-b sandst plus some vein qtz chips.	2.52						
42-44	as above.	0.06						
44-46	y-b med. sandst, some vein qtz chips. (W)	0.05						
46-48	as above with hm/Mn on fractures.	0.05	46-48	358	44 / 7	8 / 25	40 / 6	26 / 6
48-50	gr fine sandst and shale.	0.09	48-50	359 (C)	36 / 15	6 / 28	48 / 15	18 / 6
50-52	gr-g siltst with some vein qtz and FeO chips.	0.18	50-52	360 (C)	13 / 15	6 / 22	40 / 19	11 / 3
52-53	gr-g siltst with FeO along partings. (MF) EOH 53 m	0.09	52-53	361 (M)	5 / 17	4 / 15	28 / 22	8 / 4

HOLE NO: TER 21

100 000 SHEET NO: 6631

TRAVERSE: 3231 N STATION: 1000 E

LOCATION: 307665 E
6323494 N

DATE DRILLED: 22/2/93

DRILLING METHOD: RC

LOGGED BY: B J MORRIS

TOTAL DEPTH: 16 m

Depth Interval (m)	Lithology	MS	Sample Interval (m)	Sample No-RS	Selected Analyses (ppm except Au, ppb) Cu / Pb / Zn / Co / Cr / Ni / Nb / Au
0-2	r-b clay soil, weakly calc., FeO and shale pebs.	1.46			
2-4	as above.	2.38			
4-6	as above.	2.37			
6-8	g-y-b clay	0.88			
8-10	g-y-b siltst some FeO and hm along fractures. (W)	0.10	8-10	362 (C)	38 / 22 / 310 / 115 / 38 / 130 / 13 / 3
10-12	as above.	0.06	10-12	363 (C)	28 / 15 / 340 / 70 / 40 / 135 / 13 / 8
12-14	as above. (MF)	0.09	12-14	364	42 / 24 / 330 / 175 / 36 / 175 / 14 / 5
14-16	b-g siltst, some hm veinlets. EOH 16 m	0.06	14-16	365 (M)	40 / 30 / 430 / 180 / 40 / 185 / 15 / 6

HOLE NO: TER 22

100 000 SHEET NO: 6631

TRAVERSE: 3231 N STATION: 1400 E

LOCATION: 308035 E
6323663 N

DATE DRILLED: 22/2/93

DRILLING METHOD: RC

LOGGED BY: B J MORRIS

TOTAL DEPTH: 62 m

Depth Interval (m)	Lithology	MS	Sample Interval (m)	Sample No-RS	Selected Analyses (ppm except Au, ppb) Cu / Cr	Pb / Ni	Zn / Nb	Co / Au
0-2	r-b calc. clay soil with FeO pebs.	3.35						
2-4	as above with FeO, sandst and shale pebs.	1.50						
4-6	as above non calc.	1.79						
6-8	b silt-clay with y-b shale and FeO pebs.	1.45						
8-10	as above.	1.82						
10-12	as above.	5.69						
12-14	b-gr silt clay with r-b-g shale pebs.	1.67						
14-16	as above with FeO pebs.	7.05						
16-18	as above.	11.0						
18-20	as above.	14.1						
20-22	y sandst and y-b siltst, chips of FeO. (HW)	0.72	20-30	366	30 / 42	16 / 30	58 / 14	5 / 6
22-24	y-w-b, siltst.	0.07						
24-26	y siltst, some FeO chips.	0.06						
26-28	as above.	0.28						
28-30	as above.	0.05						
30-32	as above.	0.12	30-40	367	42 / 40	18 / 50	72 / 15	7 / 2
32-34	as above.	0.08						

TER 22 (Cont.)

Depth Interval (m)	Lithology	MS	Sample Interval (m)	Sample No-RS	Selected Analyses (ppm except Au, ppb) Cu / Cr	Pb / Ni	Zn / Nb	Co / Au
34-36	b-y siltst in b-y clay.	0.04						
36-38	as above.	0.16						
38-40	as above plus FeO veinlets.	0.08						
40-42	as above.	0.25	40-46	368	34 / 22	22 / 42	74 / 16	8 / <1
42-44	as above.	0.17						
44-46	gr siltst and phyllite.	0.05						
46-48	b-y siltst, chips of FeO.	0.06	46-52	369	32 / 16	22 / 74	105 / 12	40 / 1
48-50	As above.	0.10						
50-52	As above.	0.14						
52-54	g-b fine silty sandst. (W)	0.31	52-56	370	25 / 35	15 / 50	98 / 13	16 / <1
54-56	As above some FeO chips.	0.24						
56-58	gr-g silty sandst and siltst.	0.06	56-60	371	28 / 40	19 / 42	95 / 14	14 / <1
58-60	As above. (MF)	0.07						
60-62	As above.	0.08	60-62	372 (M)	32 / 42	24 / 50	100 / 14	19 / 1
	EOH 62 m							

HOLE NO: TER 23

100 000 SHEET NO: 6631

TRAVERSE: 3231 N STATION: 1000 E

LOCATION: 307665 E
6323494 N

DATE DRILLED: 22/2/93

DRILLING METHOD: RC

LOGGED BY: B J MORRIS

TOTAL DEPTH: 53 m

Depth Interval (m)	Lithology	MS	Sample Interval (m)	Sample No-RS	Selected Analyses (ppm except Au, ppb) Cu / Cr	Pb / Ni	Zn / Nb	Co / Au
0-2	r-b calc. clay soil with shale and FeO pebs.	1.62						
2-4	b and y-g silt-clay and b-y fine sandst. (W)	0.21						
4-6	as above, weakly calc.	0.10	4-14	373 (C)	40 / 50	38 / 155	155 / 13	48 / 3
6-8	as above, FeO on joints.	0.10						
8-10	gr-g fine silty sandst, some FeO chips in gr-g clay.	0.10						
10-12	as above.	0.06						
12-14	gr-g siltst.	0.11						
14-16	dark olive g micac. kimberlite. (HW)	4.54	14-16	374 (S,M,C,P)	90 / 830	19 / 6700	2450 / 165	350 / 5
16-18	as above to 16.5 then gr siltst.	0.17	16-18	375 (S, M)	32 / 52	10 / 680	370 / 36	195 / 3
18-20	gr fine sandy siltst some FeO chips.	0.07	18-28	376	34 / 28	55 / 150	200 / 13	36 / <1
20-22	as above.	0.10						
22-24	as above.	0.09						
24-26	gr siltst. in gr-g clay.	0.29						
26-28	as above.	0.13						
28-30	as above.	0.07	28-38	377	30 / 22	28 / 88	100 / 12	19 / 2
30-32	as above, FeO chips.	0.08						
32-34	as above.	0.12						

TER 23 (Cont.)

Depth Interval (m)	Lithology	MS	Sample Interval (m)	Sample No-RS	Selected Analyses (ppm except Au, ppb) Cu / Cr	Pb / Ni	Zn / Nb	Co / Au
34-36	as above.	0.10						
38-40	gr-g silty sandst and siltst in clay. (W)	2.04	38-42	378	18 / 28	15 / 38	64 / 11	10 / 2
40-42	as above.	0.10						
42-44	gr-g fine silt sandst and siltst, chips of vuggy vein qtz.	0.09	42-46	379	28 / 32	17 / 62	76 / 13	9 / 3
44-46	gr-g siltst some FeO along joints. (MF)	0.10						
46-48	as above.	0.07	46-50	380	34 / 32	26 / 62	90 / 14	13 / <1
48-50	as above, trace of apple g illite along joints.	0.09						
50-52	as above.	0.07	50-52	381	30 / 34	18 / 62	94 / 14	13 / <1
52-53	gr-g siltstone some FeO along joints. EOH 53 m	0.37	52-53	382 (M)	30 / 40	15 / 70	96 / 14	13 / 1

HOLE NO: TER 24

100 000 SHEET NO: 6631

TRAVERSE: 3231 N STATION: 2700 E

LOCATION: 309196 E
6324212 N

DATE DRILLED: 23/2/93

DRILLING METHOD: RC

LOGGED BY: B J MORRIS

TOTAL DEPTH: 29 m

Depth Interval (m)	Lithology	MS	Sample Interval (m)	Sample No-RS	Selected Analyses (ppm except Au, ppb) Cu / Cr	Pb / Ni	Zn / Nb	Co / Au
0-2	r-b calc. silt clay with shale and FeO pebs.	3.88						
2-4	gr-y clay with chips of g-y siltst. (HW)	0.36	2-10	383	38 / 28	22 / 52	195 / 12	11 / <1
4-6	gr-g siltst and fine sandst in g-y clay.	0.09						
6-8	as above.	0.06						
8-10	as above.	0.06						
10-12	as above.	0.05	10-16	384	18 / 24	11 / 22	70 / 10	6 / <1
12-14	as above.	0.03						
14-16	y-b siltst in g-y clay silt.	0.02						
16-18	gr-g fine sandst and siltst. (W)	0.08	16-22	385	30 / 25	18 / 52	160 / 12	16 / <1
18-20	as above.	0.07						
20-22	as above with FeO along joints.	0.05						
22-24	as above, some y-g illite along joints.	0.04	22-28	386	22 / 22	10 / 32	110 / 10	10 / <1
24-26	gr-g-b silty fine sandst, some hm along fractures. (MF)	0.03						
26-28	as above.	0.03						
28-29	gr-g silty fine sandst. EOH 29 m	0.03 (M)	28-29	387	17 / 17	9 / 28	110 / 10	10 / <1

HOLE NO: TER 25

100 000 SHEET NO: 6631

TRAVERSE: 3231 N STATION: 3000 E

LOCATION: 309460 E
6324364 N

DATE DRILLED: 23/2/93

DRILLING METHOD: RC

LOGGED BY: B J MORRIS

TOTAL DEPTH: 41 m

Depth Interval (m)	Lithology	MS	Sample Interval (m)	Sample No-RS	Selected Analyses (ppm except Au, ppb) Cu / Cr	Pb / Ni	Zn / Nb	Co / Au
0-2	r-b calc silt-clay soil to 0.5 then calcreted cap on y-b siltst.	0.50						
2-4	y-b clay siltst. (HW)	0.10	2-10	388	52 / 28	19 / 45	100 / 14	12 / 2
4-6	as above.	0.09						
6-8	as above.	0.05						
8-10	y-b siltst and fine sandst in gr-g clay.	0.09						
10-12	as above.	0.06	10-20	389	30 / 24	16 / 40	110 / 11	13 / <1
12-14	as above.	0.06						
14-16	y-b fine silty sandst in y-b clay.	0.05						
16-18	as above.	0.03						
18-20	as above.	0.05						
20-22	as above.	0.07	20-28	390	44 / 26	35 / 44	145 / 14	13 / 1
22-24	as above.	0.08						
24-26	as above.	0.04						
26-28	as above.	0.04						
28-30	y-b silty fine sandst. (W)	0.08	28-32	391	32 / 25	24 / 40	165 / 12	15 / 4
30-32	b-gr silty fine sandst.	0.07						

TER 25 (Cont.)

Depth Interval (m)	Lithology	MS	Sample Interval (m)	Sample No-RS	Selected Analyses (ppm except Au, ppb) Cu	Pb	Zn	Co
					Cr	Ni	Nb	Au
32-34	as above.	0.07	32-36	392	32	14	115	20
					28	42	14	<1
34-36	gr silty fine sandst.	0.07						
36-38	as above with shale.	0.08	36-40	393	32	15	125	22
					30	46	12	<1
38-40	b-gr fine silty sandst with some shale layers. (MF)	0.05						
40-41	as above. EOH 41 m	0.06	40-41	394 (M)	28	19	98	18
					28	42	12	2

HOLE NO: TER 26 | 100 000 SHEET NO: 6631

TRAVERSE: 3231 N STATION: 3500 E | LOCATION: 309900 E 6324528 N

DATE DRILLED: 23/2/93

DRILLING METHOD: RC

LOGGED BY: B J MORRIS | TOTAL DEPTH: 22 m

Depth Interval (m)	Lithology	MS	Sample Interval (m)	Sample No-RS	Selected Analyses (ppm except Au, ppb) Cu / Cr	Pb / Ni	Zn / Nb	Co / Au
0-2	0.2 m calc b silt soil on calcrete capped b-y silty sandst. (W)	0.26						
2-4	y-b silty sandst some FeO along joints.	0.13	2-10	395	22 / 22	10 / 32	70 / 9	15 / 1
4-6	as above.	0.20						
6-8	y-b silty sandst and siltst.	0.12						
8-10	as above some vuggy vein qtz chips.	0.12						
10-12	b fine silty sandst.	0.10	10-16	396	22 / 19	12 / 32	50 / 10	10 / <1
12-14	as above some FeO veinlets.	0.13						
14-16	as above, some vein qtz chips.	0.11						
16-18	as above.	0.09	16-20	397	19 / 19	11 / 28	40 / 9	10 / 1
18-20	gr-b fine silty sandst with bi rich layers. (MF)	0.12						
20-22	as above, some FeO on fractures. EOH 22 m	0.12	20-22	398 (M)	14 / 22	10 / 25	30 / 10	9 / <1

HOLE NO: TER 27

100 000 SHEET NO: 6631

TRAVERSE: 3231 N STATION: 4000 E

LOCATION: 310368 E
6324979 N

DATE DRILLED: 23/2/93

DRILLING METHOD: RC

LOGGED BY: B J MORRIS

TOTAL DEPTH: 16 m

Depth Interval (m)	Lithology	MS	Sample Interval (m)	Sample No-RS	Selected Analyses (ppm except Au, ppb) Cu / Cr	Pb / Ni	Zn / Nb	Co / Au
0-2	b calc. clay.	1.66						
2-4	as above.	2.73						
4-6	b, calc. clay with shale, qtz and FeO pebs.	4.23						
6-8	g-b siltst and fine sandst with FeO chips. (HW)	2.88						
8-10	as above. (W)	0.05	8-12	399	35 / 25	11 / 38	70 / 16	11 / <1
10-12	as above. (MF)	0.08						
12-14	as above.	0.05	12-14	400	42 / 26	12 / 36	80 / 14	16 / 1
14-16	g-b siltst and fine sandst with FeO along joints, could be weakly silicified. EOH 16 m	0.03	14-16	401 (M)	42 / 30	8 / 34	88 / 16	13 / <1

HOLE NO: TER 28

100 000 SHEET NO: 6631

TRAVERSE: 3231 N STATION: 4500 E

LOCATION: 310800 E
6324990 N

DATE DRILLED: 23/2/93

DRILLING METHOD: RC

LOGGED BY: B J MORRIS

TOTAL DEPTH: 29 m

Depth Interval (m)	Lithology	MS	Sample Interval (m)	Sample No-RS	Selected Analyses (ppm except Au, ppb) Cu / Cr	Pb / Ni	Zn / Nb	Co / Au
0-2	b calc. clay soil.	2.21						
2-4	b calc. clay minor qtz and FeO pebs.	1.60						
4-6	as above.	0.41						
6-8	as above to 7 m then y-g-b clay with chips of silty sandst. (HW)	0.25	6-12	402	20 / 30	8 / 74	175 / 12	28 / 1
8-10	y-b-g siltst some FeO along fractures.	0.07						
10-12	as above.	0.09						
12-14	g-y clay with y-b siltst chips.	0.09	12-18	403	18 / 30	8 / 90	195 / 16	32 / 2
14-16	as above.	0.08						
16-18	as above.	0.13						
18-20	as above.	0.10	18-24	404	30 / 30	7 / 40	88 / 15	12 / 2
20-22	g-y-b siltst with FeO - hm along joints. (W)	0.07						
22-24	as above.	0.08						
24-26	as above.	0.05	24-28	405	24 / 34	5 / 58	105 / 15	15 / <1
26-28	as above.	0.06						
28-29	gr-g siltst. (MF) EOH 29 m	0.08	28-29	406 (M)	62 / 34	8 / 45	78 / 16	15 / 19

HOLE NO: TER 29

100 000 SHEET NO: 6631

TRAVERSE: 3100 E STATION: 500 N

LOCATION: 310254 E
6325332 N

DATE DRILLED: 23/2/93

DRILLING METHOD: RC

LOGGED BY: B J MORRIS

TOTAL DEPTH: 20 m

Depth Interval (m)	Lithology	MS	Sample Interval (m)	Sample No-RS	Selected Analyses (ppm except Au, ppb) Cu / Cr	Pb / Ni	Zn / Nb	Co / Au
0-2	gr-b-y clay.	0.28						
2-4	as above, qtz chips.	0.30						
4-6	g-y clay with g-y-b siltst chips some FeO veinlets. (HW)	0.14	4-8	407 (C)	20 / 34	11 / 76	150 / 12	36 / 1
6-8	as above.	0.08						
8-10	as above.	0.07	8-12	408 (C)	20 / 36	13 / 90	150 / 14	52 / 1
10-12	g-y-gr siltst with FeO veinlets. (W)	0.06						
12-14	as above.	0.07	12-16	409	28 / 34	8 / 92	160 / 13	70 / 2
14-16	as above.	0.07						
16-18	as above.	0.05	16-18	410	30 / 32	9 / 72	160 / 13	24 / 2
18-20	g-gr-y siltst with FeO with FeO veinlets. (MF) EOH 20 m	0.05	18-20	411 (M)	18 / 34	8 / 88	150 / 15	40 / <1

HOLE NO: TER 30

100 000 SHEET NO: 6631

TRAVERSE: 3231 E STATION: 5600 N

LOCATION: 311788 E
6325575 N

DATE DRILLED: 23/2/93

DRILLING METHOD: RC

LOGGED BY: B J MORRIS

TOTAL DEPTH: 20 m

Depth Interval (m)	Lithology	MS	Sample Interval (m)	Sample No-RS	Selected Analyses (ppm except Au, ppb) Cu / Cr	Pb / Ni	Zn / Nb	Co / Au
0-2	b calc. clay minor FeO pebs.	1.99						
2-4	b calc. clay with FeO pebs.	0.73						
4-6	weakly calc. b clay with shale and FeO pebs.	0.82						
6-8	as above.	1.19						
8-10	as above.	0.59						
10-12	g-y clay with y-b-g siltst chips. (HW)	0.08	10-14	412	28 / 32	11 / 44	84 / 12	17 / 1
12-14	as above.	0.12						
14-16	g-y-b clay with pink siltst chips. (W)	0.10	14-18	413	30 / 32	8 / 48	92 / 13	17 / <1
16-18	as above.	0.19						
18-20	gr-g siltst. (MF)	0.06	18-20	414 (M)	32 / 34	17 / 58	98 / 15	18 / <1
	EOH 20m							

APPENDIX C

Down Holes Assays
(Amdel Report 3AD 1059)

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ANALYTICAL SERVICES

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

F I N A L A N A L Y S I S R E P O R T

Your Order No: EX1328/12/03/560 Our Job Number : 3AD1059

Samples received : 17-MAR-1993 Results reported : 31-MAR-1993
No. of samples : 137
Report comprises a cover sheet and pages 1 to 35

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

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

Approved Signatory:

John Waters
Laboratory Manager - Adelaide

CC Mr Neil Gray SA
MM Mr Neil Gray SA

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

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

C1

amdel

Job: 3AD1059
O/N: EX1328/12/03/560

ANALYTICAL REPORT

		Sample 6631RS 242	Sample 6631RS 243	Sample 6631RS 244	Sample 6631RS 245	DL	Method
Ag	ppm	<0.5	<0.5	<0.5	<0.5	0.5	IC2E
As	ppm	4	3	6	13	1.0	IC2E
Au	ppb	40	<1	15	1	1.0	FA3
Co	ppm	11	22	28	72	2.0	IC2E
Cr	ppm	28	8	13	24	2.0	IC2E
Cu	ppm	80	34	48	55	1.0	IC2E
Fe	%	3.60	2.38	5.40	13.5	0.01	IC2E
Mn	ppm	900	2000	440	690	5.0	IC2E
Mo	ppm	<1	<1	<1	<1	1.0	IC2E
Nb	ppm	15	15	14	14	2.0	XRF1
Ni	ppm	26	22	42	145	1.0	IC2E
Pb	ppm	8	6	7	5	3.0	IC2E
Zn	ppm	430	310	120	200	1.0	IC2E

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Job: 3AD1059
O/N: EX1328/12/03/560

ANALYTICAL REPORT

		Sample 6631RS 247	Sample 6631RS 248	Sample 6631RS 249	Sample 6631RS 251	DL	Method
Ag	ppm	<0.5	<0.5	<0.5	<0.5	0.5	IC2E
As	ppm	44	32	18	7	1.0	IC2E
Au	ppb	2	6	2	<1	1.0	FA3
Co	ppm	36	20	10	8	2.0	IC2E
Cr	ppm	16	14	16	10	2.0	IC2E
Cu	ppm	290	150	66	19	1.0	IC2E
Fe	%	4.86	3.44	2.70	1.17	0.01	IC2E
Mn	ppm	460	195	410	260	5.0	IC2E
Mo	ppm	<1	<1	<1	<1	1.0	IC2E
Nb	ppm	15	13	10	3	2.0	XRF1
Ni	ppm	48	28	22	11	1.0	IC2E
Pb	ppm	32	17	15	11	3.0	IC2E
Zn	ppm	430	92	100	48	1.0	IC2E

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Job: 3AD1059
O/N: EX1328/12/03/560

ANALYTICAL REPORT

		Sample 6631RS 252	Sample 6631RS 254	Sample 6631RS 255	Sample 6631RS 256	DL	Method
Ag	ppm	<0.5	<0.5	<0.5	<0.5	0.5	IC2E
As	ppm	3	16	14	78	1.0	IC2E
Au	ppb	1	5	5	1	1.0	FA3
Co	ppm	6	16	14	76	2.0	IC2E
Cr	ppm	9	16	15	14	2.0	IC2E
Cu	ppm	18	105	72	82	1.0	IC2E
Fe	%	1.03	4.26	3.60	8.70	0.01	IC2E
Mn	ppm	330	170	155	1240	5.0	IC2E
Mo	ppm	<1	<1	<1	<1	1.0	IC2E
Nb	ppm	4	13	13	11	2.0	XRF1
Ni	ppm	9	28	26	32	1.0	IC2E
Pb	ppm	8	8	7	7	3.0	IC2E
Zn	ppm	56	55	40	58	1.0	IC2E

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Job: 3AD1059
O/N: EX1328/12/03/560

ANALYTICAL REPORT

		Sample 6631RS 258	Sample 6631RS 259	Sample 6631RS 260	Sample 6631RS 261	DL	Method
Ag	ppm	<0.5	<0.5	<0.5	<0.5	0.5	IC2E
As	ppm	11	15	10	7	1.0	IC2E
Au	ppb	3	26	11	12	1.0	FA3
Co	ppm	16	34	13	12	2.0	IC2E
Cr	ppm	22	44	28	28	2.0	IC2E
Cu	ppm	38	105	135	19	1.0	IC2E
Fe	%	3.80	3.78	2.84	2.56	0.01	IC2E
Mn	ppm	1280	2250	680	520	5.0	IC2E
Mo	ppm	<1	<1	<1	<1	1.0	IC2E
Nb	ppm	9	12	14	14	2.0	XRF1
Ni	ppm	32	45	30	24	1.0	IC2E
Pb	ppm	36	30	12	10	3.0	IC2E
Zn	ppm	65	84	110	90	1.0	IC2E

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		Sample 6631RS 263	Sample 6631RS 264	Sample 6631RS 265	Sample 6631RS 266	DL	Method
Ag	ppm	<0.5	<0.5	<0.5	<0.5	0.5	IC2E
As	ppm	4	4	3	3	1.0	IC2E
Au	ppb	1	<1	<1	<1	1.0	FA3
Co	ppm	8	5	<2	<2	2.0	IC2E
Cr	ppm	9	6	12	9	2.0	IC2E
Cu	ppm	38	55	62	35	1.0	IC2E
Fe	%	6.75	3.26	5.25	2.20	0.01	IC2E
Mn	ppm	240	65	40	10	5.0	IC2E
Mo	ppm	<1	<1	<1	<1	1.0	IC2E
Nb	ppm	10	22	10	14	2.0	XRF1
Ni	ppm	16	7	6	3	1.0	IC2E
Pb	ppm	9	7	6	9	3.0	IC2E
Zn	ppm	22	12	12	7	1.0	IC2E

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ANALYTICAL REPORT

		Sample 6631RS 267	Sample 6631RS 268	Sample 6631RS 269	Sample 6631RS 270	DL	Method
Ag	ppm	<0.5	<0.5	<0.5	<0.5	0.5	IC2E
As	ppm	4	2	3	2	1.0	IC2E
Au	ppb	<1	2	<1	<1	1.0	FA3
Co	ppm	3	2	2	3	2.0	IC2E
Cr	ppm	4	4	2	2	2.0	IC2E
Cu	ppm	28	14	24	19	1.0	IC2E
Fe	%	3.04	1.56	5.55	1.09	0.01	IC2E
Mn	ppm	30	135	370	145	5.0	IC2E
Mo	ppm	<1	<1	<1	<1	1.0	IC2E
Nb	ppm	10	14	5	5	2.0	XRF1
Ni	ppm	8	4	8	6	1.0	IC2E
Pb	ppm	4	11	<3	10	3.0	IC2E
Zn	ppm	12	30	28	24	1.0	IC2E

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ANALYTICAL REPORT

		Sample 6631RS 272	Sample 6631RS 273	Sample 6631RS 274	Sample 6631RS 275	DL	Method
Ag	ppm	<0.5	<0.5	<0.5	<0.5	0.5	IC2E
As	ppm	2	2	2	2	1.0	IC2E
Au	ppb	<1	<1	<1	4	1.0	FA3
Co	ppm	<2	<2	2	4	2.0	IC2E
Cr	ppm	6	5	12	5	2.0	IC2E
Cu	ppm	36	38	90	44	1.0	IC2E
Fe	%	0.13	0.24	0.37	0.28	0.01	IC2E
Mn	ppm	210	220	70	140	5.0	IC2E
Mo	ppm	<1	<1	<1	<1	1.0	IC2E
Nb	ppm	19	12	15	7	2.0	XRF1
Ni	ppm	3	3	6	7	1.0	IC2E
Pb	ppm	5	9	7	7	3.0	IC2E
Zn	ppm	14	12	10	22	1.0	IC2E

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ANALYTICAL REPORT

		Sample 6631RS 276	Sample 6631RS 277	Sample 6631RS 279	Sample 6631RS 280	DL	Method
Ag	ppm	<0.5	<0.5	<0.5	<0.5	0.5	IC2E
As	ppm	2	6	4	8	1.0	IC2E
Au	ppb	3	3	4	10	1.0	FA3
Co	ppm	5	16	15	13	2.0	IC2E
Cr	ppm	5	4	16	13	2.0	IC2E
Cu	ppm	105	110	55	36	1.0	IC2E
Fe	%	0.38	0.95	2.78	3.04	0.01	IC2E
Mn	ppm	110	60	940	450	5.0	IC2E
Mo	ppm	<1	<1	<1	<1	1.0	IC2E
Nb	ppm	5	2	12	8	2.0	XRF1
Ni	ppm	12	38	24	16	1.0	IC2E
Pb	ppm	10	8	6	9	3.0	IC2E
Zn	ppm	15	32	38	52	1.0	IC2E

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ANALYTICAL REPORT

		Sample 6631RS 281	Sample 6631RS 283	Sample 6631RS 284	Sample 6631RS 285	DL	Method
Ag	ppm	2.5	<0.5	<0.5	<0.5	0.5	IC2E
As	ppm	3	7	2	5	1.0	IC2E
Au	ppb	4	3	4	4	1.0	FA3
Co	ppm	12	58	44	42	2.0	IC2E
Cr	ppm	11	22	19	22	2.0	IC2E
Cu	ppm	36	74	42	40	1.0	IC2E
Fe	%	2.52	4.36	3.62	4.32	0.01	IC2E
Mn	ppm	880	1220	880	1150	5.0	IC2E
Mo	ppm	<1	<1	<1	<1	1.0	IC2E
Nb	ppm	8	13	15	15	2.0	XRF1
Ni	ppm	16	88	58	78	1.0	IC2E
Pb	ppm	12	7	5	7	3.0	IC2E
Zn	ppm	68	175	230	185	1.0	IC2E

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ANALYTICAL REPORT

		Sample 6631RS 286	Sample 6631RS 288	Sample 6631RS 289	Sample 6631RS 290	DL	Method
Ag	ppm	<0.5	<0.5	<0.5	<0.5	0.5	IC2E
As	ppm	8	8	9	8	1.0	IC2E
Au	ppb	3	7	3	7	1.0	FA3
Co	ppm	26	24	84	15	2.0	IC2E
Cr	ppm	20	35	40	46	2.0	IC2E
Cu	ppm	30	44	34	38	1.0	IC2E
Fe	%	3.86	4.24	4.12	4.72	0.01	IC2E
Mn	ppm	910	920	2700	530	5.0	IC2E
Mo	ppm	<1	<1	1	<1	1.0	IC2E
Nb	ppm	15	14	14	14	2.0	XRF1
Ni	ppm	62	76	190	120	1.0	IC2E
Pb	ppm	7	12	22	11	3.0	IC2E
Zn	ppm	150	74	260	490	1.0	IC2E

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ANALYTICAL REPORT

		Sample	Sample	Sample	Sample	DL	Method
		6631RS 291	6631RS 292	6631RS 294	6631RS 295		
Ag	ppm	<0.5	<0.5	<0.5	<0.5	0.5	IC2E
As	ppm	8	8	9	10	1.0	IC2E
Au	ppb	7	3	3	4	1.0	FA3
Co	ppm	19	17	30	25	2.0	IC2E
Cr	ppm	28	38	28	24	2.0	IC2E
Cu	ppm	36	34	64	68	1.0	IC2E
Fe	%	4.56	4.14	4.46	4.68	0.01	IC2E
Mn	ppm	450	690	5200	1500	5.0	IC2E
Mo	ppm	<1	1	<1	<1	1.0	IC2E
Nb	ppm	34	16	13	13	2.0	XRF1
Ni	ppm	68	50	75	54	1.0	IC2E
Pb	ppm	15	10	34	24	3.0	IC2E
Zn	ppm	240	96	230	310	1.0	IC2E

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ANALYTICAL REPORT

		Sample 6631RS 296	Sample 6631RS 297	Sample 6631RS 299	Sample 6631RS 302	DL	Method
Ag	ppm	<0.5	<0.5	<0.5	<0.5	0.5	IC2E
As	ppm	9	9	13	7	1.0	IC2E
Au	ppb	3	3	6	4	1.0	FA3
Co	ppm	16	11	270	25	2.0	IC2E
Cr	ppm	34	32	38	60	2.0	IC2E
Cu	ppm	42	44	32	30	1.0	IC2E
Fe	%	3.88	3.48	2.68	4.80	0.01	IC2E
Mn	ppm	3750	440	2450	940	5.0	IC2E
Mo	ppm	<1	<1	1	<1	1.0	IC2E
Nb	ppm	12	12	19	28	2.0	XRF1
Ni	ppm	40	36	100	175	1.0	IC2E
Pb	ppm	24	22	11	11	3.0	IC2E
Zn	ppm	200	110	50	50	1.0	IC2E

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ANALYTICAL REPORT

		Sample 6631RS 303	Sample 6631RS 306	Sample 6631RS 307	Sample 6631RS 309	DL	Method
Ag	ppm	<0.5	<0.5	<0.5	<0.5	0.5	IC2E
As	ppm	6	4	2	6	1.0	IC2E
Au	ppb	4	3	3	<1	1.0	FA3
Co	ppm	19	17	8	8	2.0	IC2E
Cr	ppm	52	34	28	15	2.0	IC2E
Cu	ppm	46	26	30	26	1.0	IC2E
Fe	%	4.06	3.08	2.78	3.12	0.01	IC2E
Mn	ppm	530	250	55	120	5.0	IC2E
Mo	ppm	<1	<1	<1	<1	1.0	IC2E
Nb	ppm	14	14	15	14	2.0	XRF1
Ni	ppm	100	38	24	12	1.0	IC2E
Pb	ppm	13	5	4	5	3.0	IC2E
Zn	ppm	24	20	20	16	1.0	IC2E

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ANALYTICAL REPORT

		Sample 6631RS 310	Sample 6631RS 311	Sample 6631RS 312	Sample 6631RS 313	DL	Method
Ag	ppm	<0.5	<0.5	<0.5	<0.5	0.5	IC2E
As	ppm	4	3	3	3	1.0	IC2E
Au	ppb	<1	1	3	3	1.0	FA3
Co	ppm	4	3	3	10	2.0	IC2E
Cr	ppm	16	11	14	42	2.0	IC2E
Cu	ppm	15	13	36	15	1.0	IC2E
Fe	%	2.58	1.73	2.04	3.46	0.01	IC2E
Mn	ppm	60	40	130	130	5.0	IC2E
Mo	ppm	<1	<1	<1	<1	1.0	IC2E
Nb	ppm	17	14	20	16	2.0	XRF1
Ni	ppm	10	9	14	32	1.0	IC2E
Pb	ppm	13	8	8	7	3.0	IC2E
Zn	ppm	15	12	15	34	1.0	IC2E

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ANALYTICAL REPORT

		Sample 6631RS 314	Sample 6631RS 315	Sample 6631RS 317	Sample 6631RS 318	DL	Method
Ag	ppm	<0.5	<0.5	<0.5	<0.5	0.5	IC2E
As	ppm	2	4	5	4	1.0	IC2E
Au	ppb	5	7	22	4	1.0	FA3
Co	ppm	18	9	3	7	2.0	IC2E
Cr	ppm	42	44	44	18	2.0	IC2E
Cu	ppm	11	32	8	11	1.0	IC2E
Fe	%	5.60	5.95	2.48	2.50	0.01	IC2E
Mn	ppm	510	165	35	185	5.0	IC2E
Mo	ppm	<1	<1	<1	<1	1.0	IC2E
Nb	ppm	16	16	17	12	2.0	XRF1
Ni	ppm	48	32	13	20	1.0	IC2E
Pb	ppm	13	11	5	12	3.0	IC2E
Zn	ppm	68	44	30	54	1.0	IC2E

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ANALYTICAL REPORT

		Sample 6631RS 319	Sample 6631RS 320	Sample 6631RS 322	Sample 6631RS 323	DL	Method
Ag	ppm	<0.5	<0.5	<0.5	<0.5	0.5	IC2E
As	ppm	3	2	2	7	1.0	IC2E
Au	ppb	<1	1	4	<1	1.0	FA3
Co	ppm	7	9	3	4	2.0	IC2E
Cr	ppm	9	10	5	10	2.0	IC2E
Cu	ppm	7	8	6	13	1.0	IC2E
Fe	%	1.17	1.41	0.70	2.36	0.01	IC2E
Mn	ppm	150	200	35	60	5.0	IC2E
Mo	ppm	<1	<1	<1	<1	1.0	IC2E
Nb	ppm	5	4	8	17	2.0	XRF1
Ni	ppm	11	11	6	16	1.0	IC2E
Pb	ppm	7	8	5	7	3.0	IC2E
Zn	ppm	14	17	6	32	1.0	IC2E

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ANALYTICAL REPORT

		Sample 6631RS 324	Sample 6631RS 325	Sample 6631RS 326	Sample 6631RS 327	DL	Method
Ag	ppm	<0.5	<0.5	<0.5	<0.5	0.5	IC2E
As	ppm	6	4	3	2	1.0	IC2E
Au	ppb	<1	<1	<1	<1	1.0	FA3
Co	ppm	5	7	11	10	2.0	IC2E
Cr	ppm	16	30	25	76	2.0	IC2E
Cu	ppm	11	19	20	18	1.0	IC2E
Fe	%	1.75	2.94	2.96	3.12	0.01	IC2E
Mn	ppm	250	270	950	350	5.0	IC2E
Mo	ppm	<1	<1	<1	<1	1.0	IC2E
Nb	ppm	15	20	22	19	2.0	XRF1
Ni	ppm	10	12	10	14	1.0	IC2E
Pb	ppm	4	6	6	3	3.0	IC2E
Zn	ppm	12	6	4	7	1.0	IC2E

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ANALYTICAL REPORT

		Sample 6631RS 328	Sample 6631RS 329	Sample 6631RS 330	Sample 6631RS 331	DL	Method
Ag	ppm	<0.5	<0.5	<0.5	<0.5	0.5	IC2E
As	ppm	2	3	2	3	1.0	IC2E
Au	ppb	<1	<1	<1	<1	1.0	FA3
Co	ppm	60	17	8	11	2.0	IC2E
Cr	ppm	35	42	12	17	2.0	IC2E
Cu	ppm	15	13	15	10	1.0	IC2E
Fe	%	2.44	2.84	2.22	1.97	0.01	IC2E
Mn	ppm	650	390	460	560	5.0	IC2E
Mo	ppm	<1	<1	<1	<1	1.0	IC2E
Nb	ppm	18	17	17	17	2.0	XRF1
Ni	ppm	35	30	20	22	1.0	IC2E
Pb	ppm	3	4	4	4	3.0	IC2E
Zn	ppm	13	28	13	13	1.0	IC2E

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ANALYTICAL REPORT

		Sample 6631RS 332	Sample 6631RS 333	Sample 6631RS 335	Sample 6631RS 336	DL	Method
Ag	ppm	<0.5	<0.5	<0.5	<0.5	0.5	IC2E
As	ppm	3	3	3	3	1.0	IC2E
Au	ppb	<1	1	<1	2	1.0	FA3
Co	ppm	3	16	<2	<2	2.0	IC2E
Cr	ppm	15	13	16	18	2.0	IC2E
Cu	ppm	5	9	9	9	1.0	IC2E
Fe	%	0.78	1.51	3.62	3.42	0.01	IC2E
Mn	ppm	50	240	65	65	5.0	IC2E
Mo	ppm	<1	<1	<1	<1	1.0	IC2E
Nb	ppm	19	20	18	18	2.0	XRF1
Ni	ppm	9	20	5	5	1.0	IC2E
Pb	ppm	4	6	<3	<3	3.0	IC2E
Zn	ppm	4	22	7	9	1.0	IC2E

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ANALYTICAL REPORT

		Sample 6631RS 337	Sample 6631RS 338	Sample 6631RS 340	Sample 6631RS 341	DL	Method
Ag	ppm	<0.5	<0.5	<0.5	<0.5	0.5	IC2E
As	ppm	1	2	12	8	1.0	IC2E
Au	ppb	<1	<1	1	<1	1.0	FA3
Co	ppm	<2	3	10	17	2.0	IC2E
Cr	ppm	3	3	28	28	2.0	IC2E
Cu	ppm	3	3	28	44	1.0	IC2E
Fe	%	0.64	0.60	3.62	3.36	0.01	IC2E
Mn	ppm	70	195	450	60	5.0	IC2E
Mo	ppm	<1	<1	3	1	1.0	IC2E
Nb	ppm	10	11	13	16	2.0	XRF1
Ni	ppm	3	2	24	34	1.0	IC2E
Pb	ppm	3	3	13	20	3.0	IC2E
Zn	ppm	4	3	46	94	1.0	IC2E

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ANALYTICAL REPORT

		Sample 6631RS 342	Sample 6631RS 344	Sample 6631RS 345	Sample 6631RS 346	DL	Method
Ag	ppm	<0.5	<0.5	<0.5	<0.5	0.5	IC2E
As	ppm	11	4	1	2	1.0	IC2E
Au	ppb	<1	<1	4	<1	1.0	FA3
Co	ppm	19	10	35	74	2.0	IC2E
Cr	ppm	34	40	25	32	2.0	IC2E
Cu	ppm	52	115	42	35	1.0	IC2E
Fe	%	4.36	6.95	4.48	4.16	0.01	IC2E
Mn	ppm	85	280	1440	3350	5.0	IC2E
Mo	ppm	2	3	<1	<1	1.0	IC2E
Nb	ppm	15	14	17	16	2.0	XRF1
Ni	ppm	35	30	50	92	1.0	IC2E
Pb	ppm	20	19	18	9	3.0	IC2E
Zn	ppm	92	45	70	170	1.0	IC2E

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ANALYTICAL REPORT

		Sample 6631RS 347	Sample 6631RS 348	Sample 6631RS 350	Sample 6631RS 351	DL	Method
Ag	ppm	<0.5	<0.5	<0.5	<0.5	0.5	IC2E
As	ppm	3	2	24	8	1.0	IC2E
Au	ppb	2	<1	<1	<1	1.0	FA3
Co	ppm	54	54	18	9	2.0	IC2E
Cr	ppm	30	30	190	38	2.0	IC2E
Cu	ppm	38	34	58	58	1.0	IC2E
Fe	%	3.94	4.06	26.4	4.48	0.01	IC2E
Mn	ppm	2250	2100	240	120	5.0	IC2E
Mo	ppm	<1	<1	5	<1	1.0	IC2E
Nb	ppm	15	15	11	15	2.0	XRF1
Ni	ppm	90	70	32	32	1.0	IC2E
Pb	ppm	8	8	70	13	3.0	IC2E
Zn	ppm	240	250	28	98	1.0	IC2E

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ANALYTICAL REPORT

		Sample 6631RS 352	Sample 6631RS 353	Sample 6631RS 354	Sample 6631RS 355	DL	Method
Ag	ppm	<0.5	<0.5	<0.5	<0.5	0.5	IC2E
As	ppm	11	9	12	7	1.0	IC2E
Au	ppb	<1	<1	1	2	1.0	FA3
Co	ppm	16	11	20	20	2.0	IC2E
Cr	ppm	38	30	35	38	2.0	IC2E
Cu	ppm	65	40	38	28	1.0	IC2E
Fe	%	4.94	4.98	5.15	4.84	0.01	IC2E
Mn	ppm	155	185	320	390	5.0	IC2E
Mo	ppm	<1	<1	<1	<1	1.0	IC2E
Nb	ppm	15	14	13	13	2.0	XRF1
Ni	ppm	68	34	60	54	1.0	IC2E
Pb	ppm	28	24	26	12	3.0	IC2E
Zn	ppm	250	125	260	130	1.0	IC2E

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ANALYTICAL REPORT

		Sample	Sample	Sample	Sample	DL	Method
		6631RS 357	6631RS 358	6631RS 359	6631RS 360		
Ag	ppm	<0.5	<0.5	<0.5	<0.5	0.5	IC2E
As	ppm	9	11	11	12	1.0	IC2E
Au	ppb	22	6	6	3	1.0	FA3
Co	ppm	13	26	18	11	2.0	IC2E
Cr	ppm	19	7	15	15	2.0	IC2E
Cu	ppm	48	44	36	13	1.0	IC2E
Fe	%	3.06	1.51	2.68	2.70	0.01	IC2E
Mn	ppm	250	9700	3900	1000	5.0	IC2E
Mo	ppm	<1	<1	<1	<1	1.0	IC2E
Nb	ppm	14	6	15	19	2.0	XRF1
Ni	ppm	30	25	28	22	1.0	IC2E
Pb	ppm	9	8	6	6	3.0	IC2E
Zn	ppm	58	40	48	40	1.0	IC2E

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ANALYTICAL REPORT

		Sample 6631RS 362	Sample 6631RS 363	Sample 6631RS 364	Sample 6631RS 366	DL	Method
Ag	ppm	<0.5	<0.5	<0.5	<0.5	0.5	IC2E
As	ppm	18	9	14	9	1.0	IC2E
Au	ppb	3	8	5	6	1.0	FA3
Co	ppm	115	70	175	5	2.0	IC2E
Cr	ppm	38	40	36	42	2.0	IC2E
Cu	ppm	38	28	42	30	1.0	IC2E
Fe	%	3.60	3.48	3.62	4.00	0.01	IC2E
Mn	ppm	3900	1860	5400	230	5.0	IC2E
Mo	ppm	1	<1	1	<1	1.0	IC2E
Nb	ppm	13	13	14	14	2.0	XRF1
Ni	ppm	130	135	175	30	1.0	IC2E
Pb	ppm	22	15	24	16	3.0	IC2E
Zn	ppm	310	340	330	58	1.0	IC2E

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ANALYTICAL REPORT

		Sample 6631RS 367	Sample 6631RS 368	Sample 6631RS 369	Sample 6631RS 370	DL	Method
Ag	ppm	<0.5	<0.5	<0.5	<0.5	0.5	IC2E
As	ppm	10	6	8	11	1.0	IC2E
Au	ppb	2	<1	1	<1	1.0	FA3
Co	ppm	7	8	40	16	2.0	IC2E
Cr	ppm	40	22	16	35	2.0	IC2E
Cu	ppm	42	34	32	25	1.0	IC2E
Fe	%	5.00	3.96	3.84	3.50	0.01	IC2E
Mn	ppm	115	120	3550	710	5.0	IC2E
Mo	ppm	<1	1	2	<1	1.0	IC2E
Nb	ppm	15	16	12	13	2.0	XRF1
Ni	ppm	50	42	74	50	1.0	IC2E
Pb	ppm	18	22	22	15	3.0	IC2E
Zn	ppm	72	74	105	98	1.0	IC2E

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Job: 3AD1059
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ANALYTICAL REPORT

		Sample 6631RS 371	Sample 6631RS 373	Sample 6631RS 376	Sample 6631RS 377	DL	Method
Ag	ppm	<0.5	<0.5	<0.5	1.0	0.5	IC2E
As	ppm	12	5	5	4	1.0	IC2E
Au	ppb	<1	3	<1	2	1.0	FA3
Co	ppm	14	48	36	19	2.0	IC2E
Cr	ppm	40	50	28	22	2.0	IC2E
Cu	ppm	28	40	34	30	1.0	IC2E
Fe	%	3.82	3.50	5.05	4.36	0.01	IC2E
Mn	ppm	430	2100	1300	1200	5.0	IC2E
Mo	ppm	<1	<1	<1	<1	1.0	IC2E
Nb	ppm	14	13	13	12	2.0	XRF1
Ni	ppm	42	155	150	88	1.0	IC2E
Pb	ppm	19	38	55	28	3.0	IC2E
Zn	ppm	95	155	200	100	1.0	IC2E

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Job: 3AD1059
O/N: EX1328/12/03/560

ANALYTICAL REPORT

		Sample 6631RS 378	Sample 6631RS 379	Sample 6631RS 380	Sample 6631RS 381	DL	Method
Ag	ppm	<0.5	<0.5	<0.5	<0.5	0.5	IC2E
As	ppm	5	5	7	3	1.0	IC2E
Au	ppb	2	3	<1	<1	1.0	FA3
Co	ppm	10	9	13	13	2.0	IC2E
Cr	ppm	28	32	32	34	2.0	IC2E
Cu	ppm	18	28	34	30	1.0	IC2E
Fe	%	2.84	3.60	3.88	3.44	0.01	IC2E
Mn	ppm	450	190	260	130	5.0	IC2E
Mo	ppm	<1	<1	<1	<1	1.0	IC2E
Nb	ppm	11	13	14	14	2.0	XRF1
Ni	ppm	38	62	62	62	1.0	IC2E
Pb	ppm	15	17	26	18	3.0	IC2E
Zn	ppm	64	76	90	94	1.0	IC2E

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Job: 3AD1059
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ANALYTICAL REPORT

		Sample	Sample	Sample	Sample	DL	Method
		6631RS 383	6631RS 384	6631RS 385	6631RS 386		
Ag	ppm	<0.5	<0.5	<0.5	<0.5	0.5	IC2E
As	ppm	6	3	6	4	1.0	IC2E
Au	ppb	<1	<1	<1	<1	1.0	FA3
Co	ppm	11	6	16	10	2.0	IC2E
Cr	ppm	28	24	25	22	2.0	IC2E
Cu	ppm	38	18	30	22	1.0	IC2E
Fe	%	3.78	2.30	4.00	2.34	0.01	IC2E
Mn	ppm	75	50	120	125	5.0	IC2E
Mo	ppm	<1	<1	<1	<1	1.0	IC2E
Nb	ppm	12	10	12	10	2.0	XRF1
Ni	ppm	52	22	52	32	1.0	IC2E
Pb	ppm	22	11	18	10	3.0	IC2E
Zn	ppm	195	70	160	110	1.0	IC2E

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ANALYTICAL REPORT

		Sample 6631RS 388	Sample 6631RS 389	Sample 6631RS 390	Sample 6631RS 391	DL	Method
Ag	ppm	<0.5	<0.5	<0.5	<0.5	0.5	IC2E
As	ppm	7	7	7	7	1.0	IC2E
Au	ppb	2	<1	1	4	1.0	FA3
Co	ppm	12	13	13	15	2.0	IC2E
Cr	ppm	28	24	26	25	2.0	IC2E
Cu	ppm	52	30	44	32	1.0	IC2E
Fe	%	5.85	3.98	4.26	3.70	0.01	IC2E
Mn	ppm	75	65	80	90	5.0	IC2E
Mo	ppm	1	<1	<1	<1	1.0	IC2E
Nb	ppm	14	11	14	12	2.0	XRF1
Ni	ppm	45	40	44	40	1.0	IC2E
Pb	ppm	19	16	35	24	3.0	IC2E
Zn	ppm	100	110	145	165	1.0	IC2E

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ANALYTICAL REPORT

		Sample 6631RS 392	Sample 6631RS 393	Sample 6631RS 395	Sample 6631RS 396	DL	Method
Ag	ppm	<0.5	<0.5	<0.5	<0.5	0.5	IC2E
As	ppm	9	8	6	4	1.0	IC2E
Au	ppb	<1	<1	1	<1	1.0	FA3
Co	ppm	20	22	15	10	2.0	IC2E
Cr	ppm	28	30	22	19	2.0	IC2E
Cu	ppm	32	32	22	22	1.0	IC2E
Fe	%	4.04	4.18	3.12	3.10	0.01	IC2E
Mn	ppm	110	110	330	310	5.0	IC2E
Mo	ppm	<1	<1	<1	<1	1.0	IC2E
Nb	ppm	14	12	9	10	2.0	XRF1
Ni	ppm	42	46	32	32	1.0	IC2E
Pb	ppm	14	15	10	12	3.0	IC2E
Zn	ppm	115	125	70	50	1.0	IC2E

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Job: 3AD1059
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ANALYTICAL REPORT

		Sample 6631RS 397	Sample 6631RS 399	Sample 6631RS 400	Sample 6631RS 402	DL	Method
Ag	ppm	<0.5	<0.5	<0.5	<0.5	0.5	IC2E
As	ppm	5	2	2	3	1.0	IC2E
Au	ppb	1	<1	1	1	1.0	FA3
Co	ppm	10	11	16	28	2.0	IC2E
Cr	ppm	19	25	26	30	2.0	IC2E
Cu	ppm	19	35	42	20	1.0	IC2E
Fe	%	2.84	4.68	4.52	3.76	0.01	IC2E
Mn	ppm	300	520	1140	700	5.0	IC2E
Mo	ppm	<1	<1	<1	<1	1.0	IC2E
Nb	ppm	9	16	14	12	2.0	XRF1
Ni	ppm	28	38	36	74	1.0	IC2E
Pb	ppm	11	11	12	8	3.0	IC2E
Zn	ppm	40	70	80	175	1.0	IC2E

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Job: 3AD1059
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ANALYTICAL REPORT

		Sample 6631RS 403	Sample 6631RS 404	Sample 6631RS 405	Sample 6631RS 407	DL	Method
Ag	ppm	<0.5	<0.5	<0.5	<0.5	0.5	IC2E
As	ppm	2	2	2	2	1.0	IC2E
Au	ppb	2	2	<1	1	1.0	FA3
Co	ppm	32	12	15	36	2.0	IC2E
Cr	ppm	30	30	34	34	2.0	IC2E
Cu	ppm	18	30	24	20	1.0	IC2E
Fe	%	4.04	3.76	4.04	4.10	0.01	IC2E
Mn	ppm	1020	420	460	1200	5.0	IC2E
Mo	ppm	<1	<1	<1	1	1.0	IC2E
Nb	ppm	16	15	15	12	2.0	XRF1
Ni	ppm	90	40	58	76	1.0	IC2E
Pb	ppm	8	7	5	11	3.0	IC2E
Zn	ppm	195	88	105	150	1.0	IC2E

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ANALYTICAL REPORT

		Sample 6631RS 408	Sample 6631RS 409	Sample 6631RS 410	Sample 6631RS 412	DL	Method
Ag	ppm	<0.5	<0.5	<0.5	<0.5	0.5	IC2E
As	ppm	2	<1	2	2	1.0	IC2E
Au	ppb	1	2	2	1	1.0	FA3
Co	ppm	52	70	24	17	2.0	IC2E
Cr	ppm	36	34	32	32	2.0	IC2E
Cu	ppm	20	28	30	28	1.0	IC2E
Fe	%	4.46	4.06	4.40	3.46	0.01	IC2E
Mn	ppm	2900	2350	640	490	5.0	IC2E
Mo	ppm	<1	1	<1	<1	1.0	IC2E
Nb	ppm	14	13	13	12	2.0	XRF1
Ni	ppm	90	92	72	44	1.0	IC2E
Pb	ppm	13	8	9	11	3.0	IC2E
Zn	ppm	150	160	160	84	1.0	IC2E

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ANALYTICAL REPORT

		Sample	DL	Method
		6631RS 413		
Ag	ppm	<0.5	0.5	IC2E
As	ppm	3	1.0	IC2E
Au	ppb	<1	1.0	FA3
Co	ppm	17	2.0	IC2E
Cr	ppm	32	2.0	IC2E
Cu	ppm	30	1.0	IC2E
Fe	%	4.08	0.01	IC2E
Mn	ppm	650	5.0	IC2E
Mo	ppm	<1	1.0	IC2E
Nb	ppm	13	2.0	XRF1
Ni	ppm	48	1.0	IC2E
Pb	ppm	8	3.0	IC2E
Zn	ppm	92	1.0	IC2E

APPENDIX D

Multi-element Assays
(Amdel Report 3AD 1058)

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ANALYTICAL SERVICES

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

FINAL ANALYSIS REPORT

Your Order No: EX1327/12/03/559 Our Job Number : 3AD1058

Samples received : 17-MAR-1993 Results reported : 30-MAR-1993
No. of samples : 30
Report comprises a cover sheet and pages 1 to 8

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

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

Approved Signatory:

John Waters
Laboratory Manager - Adelaide

CC	Mr Neil Gray	SA
MM	Mr Neil Gray	SA

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

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

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Job: 3AD1058
O/N: EX1327/12/03/559

ANALYTICAL REPORT

		Sample	Sample	Sample	Sample	DL	Method
		6631RS 246	6631RS 250	6631RS 253	6631RS 257		
Ag	ppm	2.0	<0.5	<0.5	<0.5	0.5	IC2E
As	ppm	7	5	8	25	1.0	IC2E
Au	ppb	1	1	1	2	1.0	FA3
Ba	ppm	260	290	190	550	10.0	XRF1
Cd	ppm	<1	<1	<1	<1	1.0	IC2E
Ce	ppm	20	50	30	60	20.0	XRF1
Co	ppm	16	5	7	18	2.0	IC2E
Cr	ppm	24	10	17	15	2.0	IC2E
Cu	ppm	18	38	18	54	1.0	IC2E
Fe	%	2.96	2.08	1.47	2.96	0.01	IC2E
La	ppm	20	30	30	40	20.0	XRF1
Mn	ppm	840	690	290	240	5.0	IC2E
Mo	ppm	<1	<1	<1	<1	1.0	IC2E
Nb	ppm	6	11	6	15	2.0	XRF1
Ni	ppm	30	13	15	24	1.0	IC2E
P	ppm	220	350	360	180	5.0	IC2E
Pb	ppm	5	9	14	8	3.0	IC2E
Pd	ppb	<1	<1	<1	<1	1.0	FA3
Pt	ppb	<5	<5	<5	<5	5.0	FA3
Rb	ppm	45	94	56	210	2.0	XRF1
Sb	ppm	<4	<4	<4	<4	4.0	XRF1
Se	ppm	<2	<2	<2	<2	2.0	XRF1
Sn	ppm	<4	4	<4	4	4.0	XRF1
Sr	ppm	42	135	480	46	2.0	XRF1
Th	ppm	6	12	8	18	4.0	XRF1
U	ppm	<4	<4	<4	4	4.0	XRF1
V	ppm	9	14	24	15	1.0	IC2E
W	ppm	20	<10	<10	<10	10.0	XRF1
Zn	ppm	30	13	45	20	1.0	IC2E

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Job: 3AD1058
O/N: EX1327/12/03/559

ANALYTICAL REPORT

		Sample	Sample	Sample	Sample	DL	Method
		6631RS 262	6631RS 271	6631RS 278	6631RS 282		
Ag	ppm	<0.5	<0.5	7.5	<0.5	0.5	IC2E
As	ppm	3	3	3	5	1.0	IC2E
Au	ppb	2	1	2	1	1.0	FA3
Ba	ppm	10800	320	195	390	10.0	XRF1
Cd	ppm	<1	<1	<1	<1	1.0	IC2E
Ce	ppm	60	100	20	40	20.0	XRF1
Co	ppm	10	2	190	12	2.0	IC2E
Cr	ppm	38	4	6	11	2.0	IC2E
Cu	ppm	11	62	28	30	1.0	IC2E
Fe	%	2.70	5.80	0.66	2.44	0.01	IC2E
La	ppm	60	70	<20	20	20.0	XRF1
Mn	ppm	250	95	45	780	5.0	IC2E
Mo	ppm	<1	<1	<1	<1	1.0	IC2E
Nb	ppm	13	13	<2	9	2.0	XRF1
Ni	ppm	26	6	16	17	1.0	IC2E
P	ppm	640	830	60	480	5.0	IC2E
Pb	ppm	5	7	8	13	3.0	IC2E
Pd	ppb	<1	<1	<1	<1	1.0	FA3
Pt	ppb	<5	<5	<5	<5	5.0	FA3
Rb	ppm	150	19	10	115	2.0	XRF1
Sb	ppm	<4	4	<4	<4	4.0	XRF1
Se	ppm	<2	<2	<2	<2	2.0	XRF1
Sn	ppm	<4	<4	<4	4	4.0	XRF1
Sr	ppm	110	24	25	88	2.0	XRF1
Th	ppm	16	12	<4	10	4.0	XRF1
U	ppm	<4	5	4	<4	4.0	XRF1
V	ppm	54	14	8	20	1.0	IC2E
W	ppm	<10	<10	280	<10	10.0	XRF1
Zn	ppm	22	18	15	52	1.0	IC2E

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Job: 3AD1058
O/N: EX1327/12/03/559

ANALYTICAL REPORT

		Sample	Sample	Sample	Sample	DL	Method
		6631RS 287	6631RS 293	6631RS 298	6631RS 308		
Ag	ppm	<0.5	<0.5	<0.5	<0.5	0.5	IC2E
As	ppm	4	11	10	<1	1.0	IC2E
Au	ppb	1	<1	<1	4	1.0	FA3
Ba	ppm	630	620	620	440	10.0	XRF1
Cd	ppm	<1	<1	<1	<1	1.0	IC2E
Ce	ppm	70	70	60	70	20.0	XRF1
Co	ppm	16	17	13	10	2.0	IC2E
Cr	ppm	19	38	32	34	2.0	IC2E
Cu	ppm	28	32	28	17	1.0	IC2E
Fe	%	3.40	4.12	3.50	3.04	0.01	IC2E
La	ppm	50	60	40	50	20.0	XRF1
Mn	ppm	590	570	155	75	5.0	IC2E
Mo	ppm	<1	1	<1	<1	1.0	IC2E
Nb	ppm	13	16	13	16	2.0	XRF1
Ni	ppm	56	40	40	38	1.0	IC2E
P	ppm	175	570	1060	570	5.0	IC2E
Pb	ppm	6	12	15	5	3.0	IC2E
Pd	ppb	<1	<1	<1	<1	1.0	FA3
Pt	ppb	<5	<5	<5	<5	5.0	FA3
Rb	ppm	370	180	145	170	2.0	XRF1
Sb	ppm	<4	4	<4	<4	4.0	XRF1
Se	ppm	<2	<2	<2	<2	2.0	XRF1
Sn	ppm	<4	5	<4	5	4.0	XRF1
Sr	ppm	40	44	52	48	2.0	XRF1
Th	ppm	16	14	12	18	4.0	XRF1
U	ppm	<4	<4	4	4	4.0	XRF1
V	ppm	25	38	38	45	1.0	IC2E
W	ppm	<10	<10	<10	<10	10.0	XRF1
Zn	ppm	145	105	62	20	1.0	IC2E

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Job: 3AD1058
O/N: EX1327/12/03/559

ANALYTICAL REPORT

		Sample	Sample	Sample	Sample	DL	Method
		6631RS 316	6631RS 321	6631RS 334	6631RS 339		
Ag	ppm	<0.5	<0.5	<0.5	<0.5	0.5	IC2E
As	ppm	1	2	3	2	1.0	IC2E
Au	ppb	7	<1	1	1	1.0	FA3
Ba	ppm	410	165	470	105	10.0	XRF1
Cd	ppm	<1	<1	<1	<1	1.0	IC2E
Ce	ppm	100	50	70	80	20.0	XRF1
Co	ppm	5	7	17	7	2.0	IC2E
Cr	ppm	32	10	7	6	2.0	IC2E
Cu	ppm	22	6	12	6	1.0	IC2E
Fe	%	3.62	1.15	2.26	1.21	0.01	IC2E
La	ppm	70	30	50	60	20.0	XRF1
Mn	ppm	140	160	240	830	5.0	IC2E
Mo	ppm	<1	<1	<1	<1	1.0	IC2E
Nb	ppm	16	5	15	7	2.0	XRF1
Ni	ppm	20	12	25	2	1.0	IC2E
P	ppm	370	130	320	105	5.0	IC2E
Pb	ppm	8	10	7	8	3.0	IC2E
Pd	ppb	<1	<1	<1	<1	1.0	FA3
Pt	ppb	<5	<5	<5	<5	5.0	FA3
Rb	ppm	145	<2	100	2	2.0	XRF1
Sb	ppm	<4	<4	<4	<4	4.0	XRF1
Se	ppm	<2	<2	2	<2	2.0	XRF1
Sn	ppm	<4	<4	4	<4	4.0	XRF1
Sr	ppm	32	56	55	52	2.0	XRF1
Th	ppm	18	<4	20	6	4.0	XRF1
U	ppm	4	<4	<4	4	4.0	XRF1
V	ppm	52	7	28	8	1.0	IC2E
W	ppm	<10	<10	<10	<10	10.0	XRF1
Zn	ppm	20	9	24	4	1.0	IC2E

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Job: 3AD1058
O/N: EX1327/12/03/559

ANALYTICAL REPORT

		Sample 6631RS 343	Sample 6631RS 349	Sample 6631RS 356	Sample 6631RS 361	DL	Method
Ag	ppm	<0.5	<0.5	<0.5	<0.5	0.5	IC2E
As	ppm	15	2	4	12	1.0	IC2E
Au	ppb	2	1	2	4	1.0	FA3
Ba	ppm	670	500	480	550	10.0	XRF1
Cd	ppm	<1	<1	<1	<1	1.0	IC2E
Ce	ppm	160	70	70	80	20.0	XRF1
Co	ppm	24	32	20	8	2.0	IC2E
Cr	ppm	35	32	38	17	2.0	IC2E
Cu	ppm	84	40	32	5	1.0	IC2E
Fe	%	3.94	3.68	4.40	2.34	0.01	IC2E
La	ppm	90	40	40	60	20.0	XRF1
Mn	ppm	70	980	420	370	5.0	IC2E
Mo	ppm	2	<1	<1	<1	1.0	IC2E
Nb	ppm	16	17	14	22	2.0	XRF1
Ni	ppm	52	74	52	15	1.0	IC2E
P	ppm	510	200	800	450	5.0	IC2E
Pb	ppm	22	5	8	4	3.0	IC2E
Pd	ppb	<1	<1	<1	<1	1.0	FA3
Pt	ppb	<5	<5	<5	<5	5.0	FA3
Rb	ppm	340	200	155	240	2.0	XRF1
Sb	ppm	<4	<4	<4	<4	4.0	XRF1
Se	ppm	<2	<2	2	<2	2.0	XRF1
Sn	ppm	<4	6	5	5	4.0	XRF1
Sr	ppm	40	36	65	52	2.0	XRF1
Th	ppm	20	18	14	22	4.0	XRF1
U	ppm	8	<4	4	<4	4.0	XRF1
V	ppm	42	30	34	28	1.0	IC2E
W	ppm	<10	<10	<10	<10	10.0	XRF1
Zn	ppm	190	220	110	28	1.0	IC2E

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Job: 3AD1058
O/N: EX1327/12/03/559

ANALYTICAL REPORT

		Sample	Sample	Sample	Sample	DL	Method
		6631RS 365	6631RS 372	6631RS 382	6631RS 387		
Ag	ppm	<0.5	<0.5	<0.5	<0.5	0.5	IC2E
As	ppm	15	22	2	4	1.0	IC2E
Au	ppb	6	1	1	<1	1.0	FA3
Ba	ppm	560	450	590	360	10.0	XRF1
Cd	ppm	1	<1	<1	<1	1.0	IC2E
Ce	ppm	70	60	60	30	20.0	XRF1
Co	ppm	180	19	13	10	2.0	IC2E
Cr	ppm	40	42	40	17	2.0	IC2E
Cu	ppm	40	32	30	17	1.0	IC2E
Fe	%	3.48	3.92	3.62	1.53	0.01	IC2E
La	ppm	50	40	40	20	20.0	XRF1
Mn	ppm	5100	165	75	135	5.0	IC2E
Mo	ppm	1	<1	<1	<1	1.0	IC2E
Nb	ppm	15	14	14	10	2.0	XRF1
Ni	ppm	185	50	70	28	1.0	IC2E
P	ppm	990	1260	1640	670	5.0	IC2E
Pb	ppm	30	24	15	9	3.0	IC2E
Pd	ppb	<1	<1	<1	<1	1.0	FA3
Pt	ppb	<5	<5	<5	<5	5.0	FA3
Rb	ppm	270	140	145	105	2.0	XRF1
Sb	ppm	<4	<4	<4	<4	4.0	XRF1
Se	ppm	<2	<2	2	<2	2.0	XRF1
Sn	ppm	<4	4	4	<4	4.0	XRF1
Sr	ppm	96	55	56	38	2.0	XRF1
Th	ppm	12	12	12	10	4.0	XRF1
U	ppm	8	<4	<4	4	4.0	XRF1
V	ppm	48	50	42	24	1.0	IC2E
W	ppm	<10	<10	<10	<10	10.0	XRF1
Zn	ppm	430	100	96	110	1.0	IC2E

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Job: 3AD1058
O/N: EX1327/12/03/559

ANALYTICAL REPORT

		Sample	Sample	Sample	Sample	DL	Method
		6631RS 394	6631RS 398	6631RS 401	6631RS 406		
Ag	ppm	<0.5	<0.5	<0.5	<0.5	0.5	IC2E
As	ppm	7	5	2	3	1.0	IC2E
Au	ppb	2	<1	<1	19	1.0	FA3
Ba	ppm	430	380	670	450	10.0	XRF1
Cd	ppm	<1	<1	<1	<1	1.0	IC2E
Ce	ppm	60	30	120	70	20.0	XRF1
Co	ppm	18	9	13	15	2.0	IC2E
Cr	ppm	28	22	30	34	2.0	IC2E
Cu	ppm	28	14	42	62	1.0	IC2E
Fe	%	3.50	2.70	3.62	3.82	0.01	IC2E
La	ppm	30	20	70	40	20.0	XRF1
Mn	ppm	85	125	900	340	5.0	IC2E
Mo	ppm	<1	<1	<1	<1	1.0	IC2E
Nb	ppm	12	10	16	16	2.0	XRF1
Ni	ppm	42	25	34	45	1.0	IC2E
P	ppm	1580	570	270	1200	5.0	IC2E
Pb	ppm	19	10	8	8	3.0	IC2E
Pd	ppb	<1	<1	<1	<1	1.0	FA3
Pt	ppb	<5	<5	<5	<5	5.0	FA3
Rb	ppm	160	82	200	135	2.0	XRF1
Sb	ppm	<4	<4	<4	<4	4.0	XRF1
Se	ppm	<2	<2	<2	2	2.0	XRF1
Sn	ppm	6	<4	<4	6	4.0	XRF1
Sr	ppm	44	28	70	120	2.0	XRF1
Th	ppm	12	8	12	18	4.0	XRF1
U	ppm	<4	<4	<4	<4	4.0	XRF1
V	ppm	38	34	35	32	1.0	IC2E
W	ppm	<10	<10	<10	<10	10.0	XRF1
Zn	ppm	98	30	88	78	1.0	IC2E

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Job: 3AD1058
O/N: EX1327/12/03/559

ANALYTICAL REPORT

		Sample 6631RS 411	Sample 6631RS 414	DL	Method
Ag	ppm	<0.5	<0.5	0.5	IC2E
As	ppm	3	2	1.0	IC2E
Au	ppb	<1	<1	1.0	FA3
Ba	ppm	530	570	10.0	XRF1
Cd	ppm	<1	<1	1.0	IC2E
Ce	ppm	70	70	20.0	XRF1
Co	ppm	40	18	2.0	IC2E
Cr	ppm	34	34	2.0	IC2E
Cu	ppm	28	32	1.0	IC2E
Fe	%	3.96	3.88	0.01	IC2E
La	ppm	50	40	20.0	XRF1
Mn	ppm	810	400	5.0	IC2E
Mo	ppm	1	<1	1.0	IC2E
Nb	ppm	15	15	2.0	XRF1
Ni	ppm	88	58	1.0	IC2E
P	ppm	330	900	5.0	IC2E
Pb	ppm	8	17	3.0	IC2E
Pd	ppb	<1	<1	1.0	FA3
Pt	ppb	<5	<5	5.0	FA3
Rb	ppm	155	150	2.0	XRF1
Sb	ppm	<4	4	4.0	XRF1
Se	ppm	<2	<2	2.0	XRF1
Sn	ppm	4	<4	4.0	XRF1
Sr	ppm	68	180	2.0	XRF1
Th	ppm	15	10	4.0	XRF1
U	ppm	4	<4	4.0	XRF1
V	ppm	30	32	1.0	IC2E
W	ppm	<10	<10	10.0	XRF1
Zn	ppm	150	98	1.0	IC2E

APPENDIX E

Silicate Analysis
(Amdel Report 3AD 1057)

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

F I N A L A N A L Y S I S R E P O R T

Your Order No: EX1326/12/03/558 Our Job Number : 3AD1057

Samples received : 17-MAR-1993 Results reported : 06-APR-1993
No. of samples : 6
Report comprises a cover sheet and pages 1 to 2

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

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

Approved Signatory:

John Waters
Laboratory Manager - Adelaide

CC	Mr Neil Gray	SA
MM	Mr Neil Gray	SA

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

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

E1

amdel

Job: 3AD1057
O/N: EX1326/12/03/558

ANALYTICAL REPORT

		Sample	Sample	Sample	Sample	DL	Method
		6631RS 300	6631RS 301	6631RS 304	6631RS 305		
SiO2	%	56.4	56.0	33.1	65.4	0.01	IC4
TiO2	%	1.17	1.44	0.93	0.61	0.01	IC4
Al2O3	%	6.80	11.7	3.16	11.0	0.01	IC4
Fe2O3	%	11.2	13.2	9.50	6.65	0.01	IC4
MnO	%	0.46	0.33	0.20	0.03	0.01	IC4
MgO	%	6.60	5.10	13.4	2.34	0.01	IC4
CaO	%	2.96	0.83	12.7	0.50	0.01	IC4
Na2O	%	0.58	0.61	0.28	0.77	0.01	IC4
K2O	%	1.99	2.44	0.89	5.25	0.01	IC4
P2O5	%	0.44	0.37	0.59	0.17	0.01	IC4
LOI	%	9.45	7.75	23.9	5.70	0.01	IC4
Ag	ppm	<0.5	<0.5	<0.5	<0.5	0.5	IC2E
As	ppm	4	7	3	3	1.0	IC2E
Au	ppb	26	42	6	3	1.0	FA3
Ba	ppm	7700	3350	530	440	10.0	XRF1
Cd	ppm	<1	<1	<1	<1	1.0	IC2E
Ce	ppm	120	160	90	60	20.0	XRF1
Co	ppm	115	80	76	15	2.0	IC2E
Cr	ppm	280	310	210	56	2.0	IC2E
Cu	ppm	52	62	65	15	1.0	IC2E
Fe	%	7.10	8.15	5.75	4.52	0.01	IC2E
La	ppm	100	110	60	50	20.0	XRF1
Mn	ppm	3400	2550	1380	210	5.0	IC2E
Mo	ppm	<1	2	<1	<1	1.0	IC2E
Nb	ppm	84	92	72	17	2.0	XRF1
Ni	ppm	590	570	700	58	1.0	IC2E
P	ppm	1400	1420	1460	760	5.0	IC2E
Pb	ppm	26	46	19	11	3.0	IC2E
Pd	ppb	5	8	1	<1	1.0	FA3
Pt	ppb	<5	<5	<5	<5	5.0	FA3
Rb	ppm	105	110	42	125	2.0	XRF1
Sb	ppm	<4	<4	<4	<4	4.0	XRF1
Se	ppm	<2	2	<2	<2	2.0	XRF1
Sn	ppm	<4	<4	<4	5	4.0	XRF1
Sr	ppm	260	110	300	60	2.0	XRF1
Th	ppm	18	25	10	16	4.0	XRF1
U	ppm	<4	5	<4	4	4.0	XRF1
V	ppm	110	130	65	50	1.0	IC2E
W	ppm	<10	<10	10	<10	10.0	XRF1
Zn	ppm	115	120	44	10	1.0	IC2E

amdel

Job: 3AD1057
O/N: EX1326/12/03/558

ANALYTICAL REPORT

		Sample	Sample	DL	Method
		6631RS 374	6631RS 375		
SiO2	%	31.4	61.3	0.01	IC4
TiO2	%	2.48	1.06	0.01	IC4
Al2O3	%	5.45	12.2	0.01	IC4
Fe2O3	%	15.4	7.80	0.01	IC4
MnO	%	0.44	2.06	0.01	IC4
MgO	%	12.7	4.02	0.01	IC4
CaO	%	7.50	0.53	0.01	IC4
Na2O	%	0.66	0.99	0.01	IC4
K2O	%	1.34	3.06	0.01	IC4
P2O5	%	0.75	0.23	0.01	IC4
LOI	%	19.5	7.45	0.01	IC4
Ag	ppm	<0.5	<0.5	0.5	IC2E
As	ppm	<1	1	1.0	IC2E
Au	ppb	5	3	1.0	FA3
Ba	ppm	1320	2700	10.0	XRF1
Cd	ppm	8	4	1.0	IC2E
Ce	ppm	250	100	20.0	XRF1
Co	ppm	350	195	2.0	IC2E
Cr	ppm	830	52	2.0	IC2E
Cu	ppm	90	32	1.0	IC2E
Fe	%	10.1	2.26	0.01	IC2E
La	ppm	170	60	20.0	XRF1
Mn	ppm	3900	7600	5.0	IC2E
Mo	ppm	<1	<1	1.0	IC2E
Nb	ppm	165	36	2.0	XRF1
Ni	ppm	6700	680	1.0	IC2E
P	ppm	2700	450	5.0	IC2E
Pb	ppm	19	10	3.0	IC2E
Pd	ppb	13	8	1.0	FA3
Pt	ppb	5	<5	5.0	FA3
Rb	ppm	60	440	2.0	XRF1
Sb	ppm	<4	<4	4.0	XRF1
Se	ppm	<2	<2	2.0	XRF1
Sn	ppm	<4	<4	4.0	XRF1
Sr	ppm	540	160	2.0	XRF1
Th	ppm	24	15	4.0	XRF1
U	ppm	4	<4	4.0	XRF1
V	ppm	125	48	1.0	IC2E
W	ppm	<10	<10	10.0	XRF1
Zn	ppm	2450	370	1.0	IC2E

APPENDIX F

Check Assays
(Analabs Report 105000.45.10143)

ANALABS
A Division of Inchcape Testing Services (Australia) Pty. Ltd.
A.C.N. 004 591 664
A.C.N. 004 591 664

Phone (08)3365099 | 16 Sunbeam Road, Glynde,S.A. 5070 | Fax (08) 3365564

ANALYTICAL REPORT No. 105000.35.10143

THIS REPORT MUST BE READ IN CONJUNCTION WITH THE ACCOMPANYING ANALYTICAL DATA

INVOICE TO:
Mr N Gray
The Director General
PO Box 151

Eastwood SA 5063

ORDER No.	PROJECT
12/03/575.Ex1	

DATE RECEIVED	RESULTS REQUIRED
03/08/93	ASAP

No. OF PAGES OF RESULTS	DATE REPORTED	No. OF COPIES
4	16/08/93	1

TOTAL No. OF SAMPLES: 32

SAMPLE NUMBERS	SAMPLE DESCRIPTION	ELEMENT/METHOD
6631 RS & others	ro Prep : GP029,S9900	Cu,Pb,Zn,Ag,Co,Ni,Cr,Mn,Mo,Fe,As/GA115
6631 RS & others	ro Prep :	Au/GG337

RESULTS TO
Mr N Gray
The Director General
PO Box 151

Eastwood SA 5063

RESULTS TO

RESULTS TO

REMARKS

AUTHORISED OFFICER

F1

ANALABS

A Division of Inchcape Testing Services (Australia) Pty. Ltd.
A.C.N. 004 591 664

ANALYTICAL DATA

SAMPLE PREFIX	REPORT No.	REPORT DATE	CLIENT ORDER No.	PAGE
	105000.35.10143	16/08/93	12/03/575.Ex1	1 OF 4

TUBE No.	SAMPLE No.	Au	Au(R)	Cu	Pb	Zn	Ag	Co	Ni
1	6631 RS 242	0.043	0.046	59.2	4.6	273.0	<0.1	7.9	20.1
2	6631 RS 247	0.002	-	217.0	22.4	147.0	0.2	24.4	35.0
3	6631 RS 248	0.005	-	136.0	13.8	95.0	<0.1	14.7	22.2
4	6631 RS 254	0.004	-	80.0	5.8	59.0	<0.1	11.7	22.3
5	6631 RS 259	0.024	-	92.0	28.4	75.6	0.2	27.4	36.1
6	6631 RS 260	0.009	-	107.0	8.9	91.5	0.1	11.1	25.3
7	6631 RS 276	0.005	-	103.0	5.8	11.5	0.3	4.9	12.8
8	6631 RS 277	0.002	-	92.0	5.0	27.5	0.2	15.2	31.1
9	6631 RS 280	0.009	-	24.2	7.8	42.2	0.1	6.7	11.9
10	6631 RS 288	0.002	-	38.7	13.2	77.5	<0.1	26.7	88.6
11	6631 RS 289	0.002	-	27.4	16.0	199.3	<0.1	59.3	148.0
12	6631 RS 290	0.001	-	26.1	10.0	385.0	<0.1	15.5	101.0
13	6631 RS 295	0.004	-	26.5	14.3	61.7	<0.1	14.4	42.4
14	6631 RS 296	0.001	-	22.2	16.9	95.8	<0.1	11.4	30.3
15	6631 RS 301	0.055	0.053	50.0	34.4	95.6	<0.1	56.7	418.0
16	6631 RS 305	0.002	-	12.6	7.0	7.0	<0.1	11.8	44.6
17	6631 RS 306	0.002	-	20.5	3.9	7.6	0.2	17.5	33.7
18	6631 RS 312	<0.001	-	21.0	4.2	3.8	<0.1	3.0	13.8
19	6631 RS 313	0.003	-	12.6	5.2	30.1	<0.1	7.2	27.6
20	6631 RS 317	0.025	-	7.0	4.2	31.3	<0.1	3.0	11.3
21	6631 RS 345	<0.001	-	33.0	17.4	56.4	0.1	31.8	39.5
22	6631 RS 346	<0.001	-	30.1	9.4	141.7	0.1	74.3	83.6
23	6631 RS 359	0.005	-	31.0	4.9	43.2	<0.1	15.8	23.6
24	6631 RS 360	0.003	-	11.8	4.5	35.7	<0.1	10.1	17.3
25	6631 RS 362	0.001	-	33.9	19.3	280.0	<0.1	102.0	113.0

Results in ppm unless otherwise specified
T = element present; but concentration too low to measure
X = element concentration is below detection limit
- = element not determined

AUTHORISED OFFICER *Keith Hand*

ANALABS

A Division of Inchcape Testing Services (Australia) Pty. Ltd.
A.C.N. 004 591 664

ANALYTICAL DATA

SAMPLE PREFIX	REPORT No.	REPORT DATE	CLIENT ORDER No.	PAGE
	105000.35.10143	16/08/93	12/03/575.Ex1	2 OF 4

TUBE No.	SAMPLE No.	Au	Au(R)	Cu	Pb	Zn	Ag	Co	Ni
1	6631 RS 363	0.008	-	23.0	11.7	302.0	<0.1	54.0	109.0
2	6631 RS 373	0.001	-	33.7	25.0	146.7	<0.1	49.3	141.0
3	6631 RS 374	0.005	-	49.5	6.6	270.0	0.1	150.0	3029.0
4	6631 RS 407	0.001	-	15.5	6.2	128.8	0.1	31.4	63.3
5	6631 RS 408	<0.001	<0.001	16.2	11.0	135.3	<0.1	41.3	96.5
6	QC6631RS260	0.011	-	107.0	9.6	91.5	0.1	10.8	25.0
7	QC6631RS280	0.009	-	24.6	7.4	42.4	<0.1	7.3	11.1
8									
9									
10									
11									
12									
13									
14									
15									
16									
17									
18									
19									
20									
21									
22									
23	DETECTION	0.001	0.001	0.5	0.5	0.5	0.1	0.5	0.5
24	UNITS	ppm	ppm	PPM	PPM	PPM	PPM	PPM	PPM
25	METHOD	GG337	GG337	GA115	GA115	GA115	GA115	GA115	GA115

Results in ppm unless otherwise specified
T = element present; but concentration too low to measure
X = element concentration is below detection limit
- = element not determined

AUTHORISED OFFICER *Keith Hand*

ANALABS

A Division of Inchcape Testing Services (Australia) Pty. Ltd.
A.C.N. 004 591 664

ANALYTICAL DATA

SAMPLE PREFIX	REPORT No.	REPORT DATE	CLIENT ORDER No.	PAGE
	105000.35.10143	16/08/93	12/03/575.Ex1	3 OF 4

TUBE No.	SAMPLE No.	Cr	Mn	Mo	As	Fe			
1	6631 RS 242	26	967	1	10	3.81			
2	6631 RS 247	19	408	1	40	5.44			
3	6631 RS 248	16	188	1	35	3.59			
4	6631 RS 254	19	164	<1	20	4.20			
5	6631 RS 259	49	2200	<1	20	4.23			
6	6631 RS 260	28	733	<1	20	3.16			
7	6631 RS 276	7	145	1	10	0.83			
8	6631 RS 277	7	122	<1	15	1.46			
9	6631 RS 280	15	495	<1	15	3.34			
10	6631 RS 288	42	1263	2	15	4.90			
11	6631 RS 289	41	2503	3	15	4.12			
12	6631 RS 290	41	720	<1	10	4.44			
13	6631 RS 295	28	1000	<1	15	4.40			
14	6631 RS 296	34	3524	1	15	3.30			
15	6631 RS 301	330	2738	3	15	8.60			
16	6631 RS 305	61	195	<1	10	4.75			
17	6631 RS 306	38	282	<1	15	3.07			
18	6631 RS 312	16	121	<1	10	2.14			
19	6631 RS 313	46	118	<1	15	3.34			
20	6631 RS 317	48	40	<1	15	2.85			
21	6631 RS 345	29	1480	1	15	4.70			
22	6631 RS 346	38	3716	1	15	4.44			
23	6631 RS 359	21	3085	1	15	3.07			
24	6631 RS 360	20	864	1	15	3.45			
25	6631 RS 362	40	3977	3	25	4.26			

Results in ppm unless otherwise specified
T = element present; but concentration too low to measure
X = element concentration is below detection limit
– = element not determined

AUTHORISED OFFICER *Keith Hand*

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A Division of Inchcape Testing Services (Australia) Pty. Ltd.
A.C.N. 004 591 664

ANALYTICAL DATA

SAMPLE PREFIX	REPORT No.	REPORT DATE	CLIENT ORDER No.	PAGE
	105000.35.10143	16/08/93	12/03/575.Ex1	4 OF 4

TUBE No.	SAMPLE No.	Cr	Mn	Mo	As	Fe			
1	6631 RS 363	46	1405	<1	10	4.23			
2	6631 RS 373	60	1760	<1	15	4.24			
3	6631 RS 374	588	2515	<1	10	11.02			
4	6631 RS 407	42	1375	1	5	5.26			
5	6631 RS 408	46	2760	2	10	4.91			
6	QC6631RS260	30	722	<1	20	3.08			
7	QC6631RS280	16	490	1	10	3.36			
8									
9									
10									
11									
12									
13									
14									
15									
16									
17									
18									
19									
20									
21									
22									
23	DETECTION	1	1	1	5	0.01			
24	UNITS	PPM	PPM	PPM	PPM	%			
25	METHOD	GA115	GA115	GA115	GA115	GA140			

Results in ppm unless otherwise specified
T = element present; but concentration too low to measure
X = element concentration is below detection limit
– = element not determined

AUTHORISED OFFICER *Keith Hand*

APPENDIX G

Petrological Reports:

- Amdel Report G699200G/93
  (samples 6631 RS 304 and 6631 RS 374)

- Pontifex and Assocs. Pty. Ltd. Mineralogical Report 6245
  (Sample 6731 RS 757, Pine Creek Kimberlite)

amdel
Amdel Limited
A.C.N. 008 127 802

Mineral Services Laboratory
31 Flemington Street
Frewville SA 5063
AUSTRALIA

PO Box 338
Torrensville SA 5031
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Telephone: (08) 372 2700
Facsimile: (08) 379 6623
Telex: AA 82520

21 April 1993

Mr B J Morris
SA Department of Mines & Energy
PO Box 151
EASTWOOD SA 5063

REPORT G699200G/93
PETROLOGY OF TWO MICA PERIDOTITES

YOUR REFERENCE:	12/03/557
SAMPLE IDENTIFICATION:	6631RS304 and 374
MATERIAL:	Drill cuttings
LOCATION:	Adelaide Geosyncline, SA
DATE RECEIVED:	18 March 1993
WORK REQUIRED:	Petrography (2 × Code PET 1.3.2)
Investigation and Report by:	Frank Radke

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

G1

SAMPLE: **6631RS304:TER 12, 32m : TSC59494**

ROCK NAME: **Mica peridotite**

HAND SPECIMEN:

This sample consists of friable, pale brown chips generally about 2 cm in size. The thin section was cut from three chips.

THIN SECTION:

An optical estimate of the constituents gives the following :

Mineral	%	Origin
Mica (?phlogopite)	60	Igneous
Clay/chlorite	25	Alteration
Quartz/chert	5	Alteration
Opaques & semi-opaques	10	Alteration

All three chips from which the thin section was made have a very similar mineralogy being comprised mainly of large mica flakes up to 1 mm in length intergrown with a weakly birefringent clay/chlorite, opaque to translucent, reddish-brown iron oxides and smaller amounts of a finely granular chert. The mica flakes generally exhibit a very pale brown or more rarely green, weakly pleochroic colour and are very likely phlogopite. Many of the mica flakes exhibit a weakly developed preferred orientation defining a vague foliation direction although within some regions the mica flakes have a random orientation. Many of the mica flakes have a fibrous, degraded character although some larger well developed flakes are present. Even the well developed flakes tend to have irregular and embayed shapes.

The weakly birefringent clay tends to occur interstitial to the mica flakes forming colourless, flaky aggregates. This material is thought to consist largely of a weakly birefringent clay although it could include some chlorite.

Finely granular chert is locally present as irregular patches up to 1 mm in size. Many of the chert patches have anhedral to weakly subhedral shapes with fractured characters typical of olivine crystals. It is considered likely that these chert patches represent silicified olivine crystals.

Opaque to translucent, reddish-brown iron oxides form irregular patches intergrown with the phyllosilicates. Within localised areas abundant translucent, reddish-brown iron oxides are present while other areas contain only minor, finely divided intergrowths. Translucent, reddish-brown iron oxides also form narrow fracture and vein fillings including some fracture linings associated with what are interpreted to be silicified olivine crystals.

This is a mica peridotite or kimberlite comprised largely of mica flakes (probably phlogopite) showing alteration to a clay/chlorite as well as silicification and replacement by opaque to translucent iron oxides all of which are interpreted to be a weathering feature.

SAMPLE: **6631RS374:TER 23, 14-16 m : TSC59495**

ROCK NAME: **Mica peridotite**

HAND SPECIMEN:

This sample consists of angular chips up to about 3 cm in size which have a fragmental character and a bluish-grey colour.

THIN SECTION:

An optical estimate of the constituents gives the following :

Mineral	%	Origin
Mica (?phlogopite)	40	Igneous
Clay/chlorite	30	Alteration
Carbonate	25	Alteration
Opaques & semi-opaques	5	(?)Igneous/alteration

The thin section was cut from three chips all of which have a similar mineralogy being comprised of small mica flakes intergrown with a weakly birefringent clay/chlorite and localised granular aggregates of carbonate. All three chips show some variation in textures within different areas but the obvious fragmental character noted in hand specimen is not readily apparent in thin section. The mica is a very weakly pleochroic, green to brown variety and is most likely phlogopite. Most of the mica forms flakes below 0.5 mm in size which at least locally exhibit a subparallel orientation defining a vague foliation direction. This foliation direction is highly erratic and quite variable within different portions of even the same rock chip.

The clay/chlorite generally occurs interstitial to the mica flakes and has a very weakly birefringent character.

The carbonate tends to be concentrated in irregular patches up to 4 mm in size which impart the fragmental character to the rock. Staining of half the thin section with an alizarin red-S solution shows that most of the carbonate is calcite although it does show some variability in the degree of staining suggesting possible variations in magnesium content. A small proportion of the carbonate is unstained and is most likely dolomite.

Opaques are disseminated through the rock as anhedral, angular grains up to 0.5 mm in size. Most of these opaque grains are thought to be of primary origin. The rock also contains some translucent, reddish-brown iron oxides as localised patches and vague veinlike structures which are thought to be limonitic material of weathering origin.

This is a mica peridotite or kimberlite which differs from sample 6631RS304 in that it has significant carbonate which is most likely a late-stage, deuteric alteration product. The rock also contains significant amounts of clay/chlorite and minor limonite which is most likely a weathering feature. The localised concentrations of chert believed to be pseudomorphic after original olivine crystals evident in sample 6631RS304 were not detected in this sample.

6731 RS 757 : CRN55, 44-47.5m

Altered micaceous kimberlite with scattered fine ?perovskite, magnetite and ilmenite. Minor secondary rutile. Groundmass mostly very fine compact phlogopite, incorporating megacrysts and small phenocrysts of ex-olivine, largely altered to smectite. Scattered coarse crystals of phlogopite.

Three chips of this core samples to 20mm across are included in this composite polished thin section. Megacrysts, probably of olivine, to 10mm or more in maximum dimension, are scattered to form about 20% of each of these fragments, and have been altered to smectite (?saponite) ± carbonate ± limonite. Smaller 'rounded' olivine grains (10-12%) to 1.5mm are also scattered and largely altered to smectite. Flakes of phlogopite (7% of each chip) to 2mm size, have olive brown cores and reddish rims, and some appear to lack pleochroism, which may indicate transition between normal phlogopite and reverse-pleochroic tetraferriphlogopite [$KMg_3Fe^{3+}Si_3O_{10}(OH)_2$].

The groundmass to these scattered crystals is mostly extremely fine compact phlogopite, with irregularly disseminated carbonate.

Minor (7-10%) transluscent high relief grains, with a low birefringence, are scattered and mostly about 0.1mm in size. These are probably perovskite but lack the typical grid-twinning of that mineral. They are rimmed by magnetite. Zoned grains from titanomagnetite to magnetite, and crystals of ilmenite, locally altered to rutile, are accessory, locally (and finer) were abundant.

A vein of carbonate, about 2mm wide, has altered deformed large phlogopite crystals and veinlets of smectite.

Sample 6731 RS 757 appears to have been a micaceous kimberlite with altered olivine as megacrysts and small grains, abundant phlogopite, minor carbonate, and possibly perovskite ($CaTiO_3$ to $NaNbO_3$ with rare earths etc.). Minor magnetite, ilmenite and rutile are also present. The accessories indicate very low silica activities. The carbonate is possibly of secondary origin, but could indicate a link with carbonatite magma, as could the reddish rims on the phlogopite. The groundmass phlogopite is similar to the rims on the phlogopite phenocrysts. SEM analyses of the phlogopite and ?perovskite may be useful in attempting to elucidate any kimberlite-carbonatite relationships.

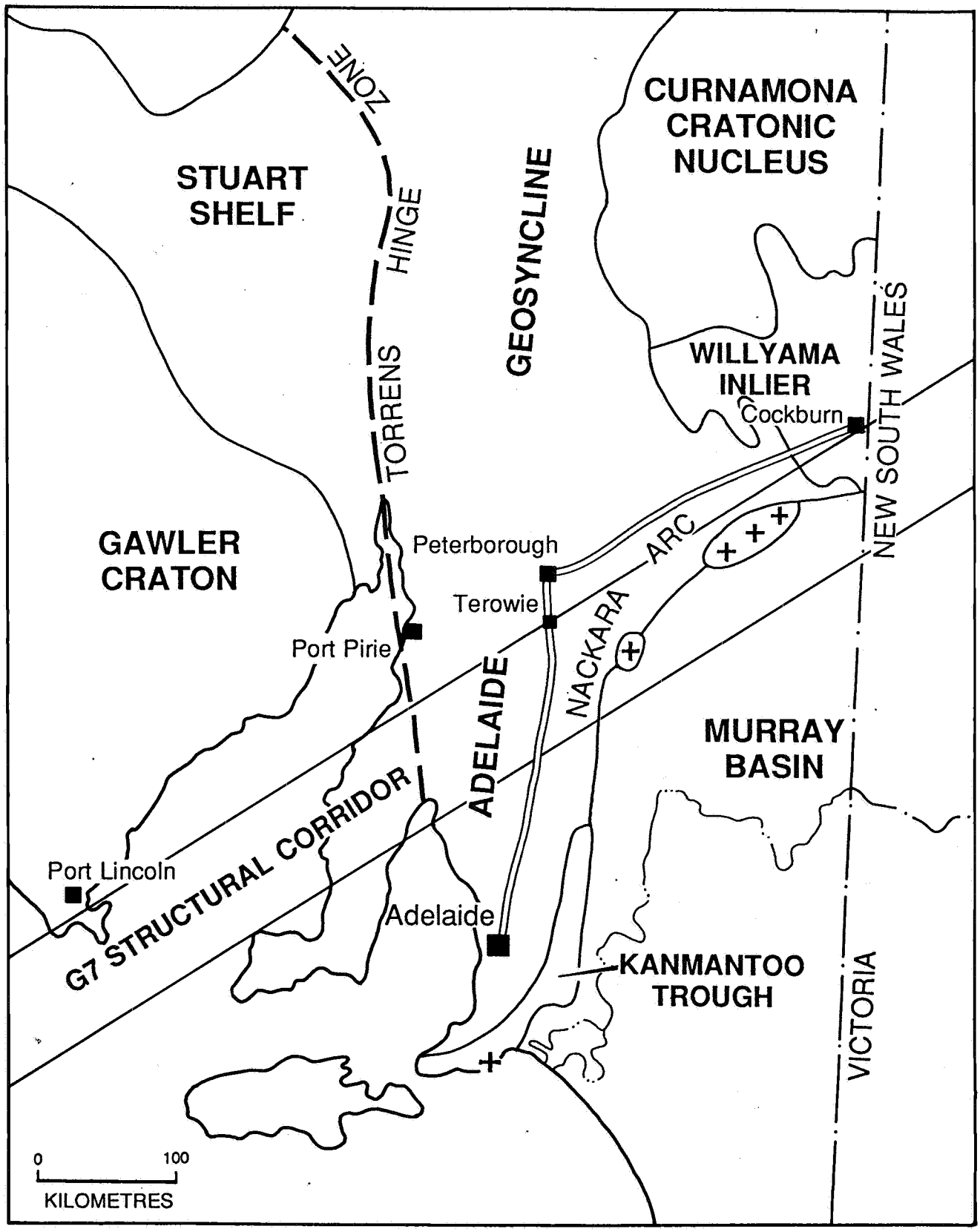


Fig. 1 BURRA-NACKARA ARC BEDROCK DRILLING, TEROWIE AREA
LOCALITY PLAN

DME_SA 93-1392

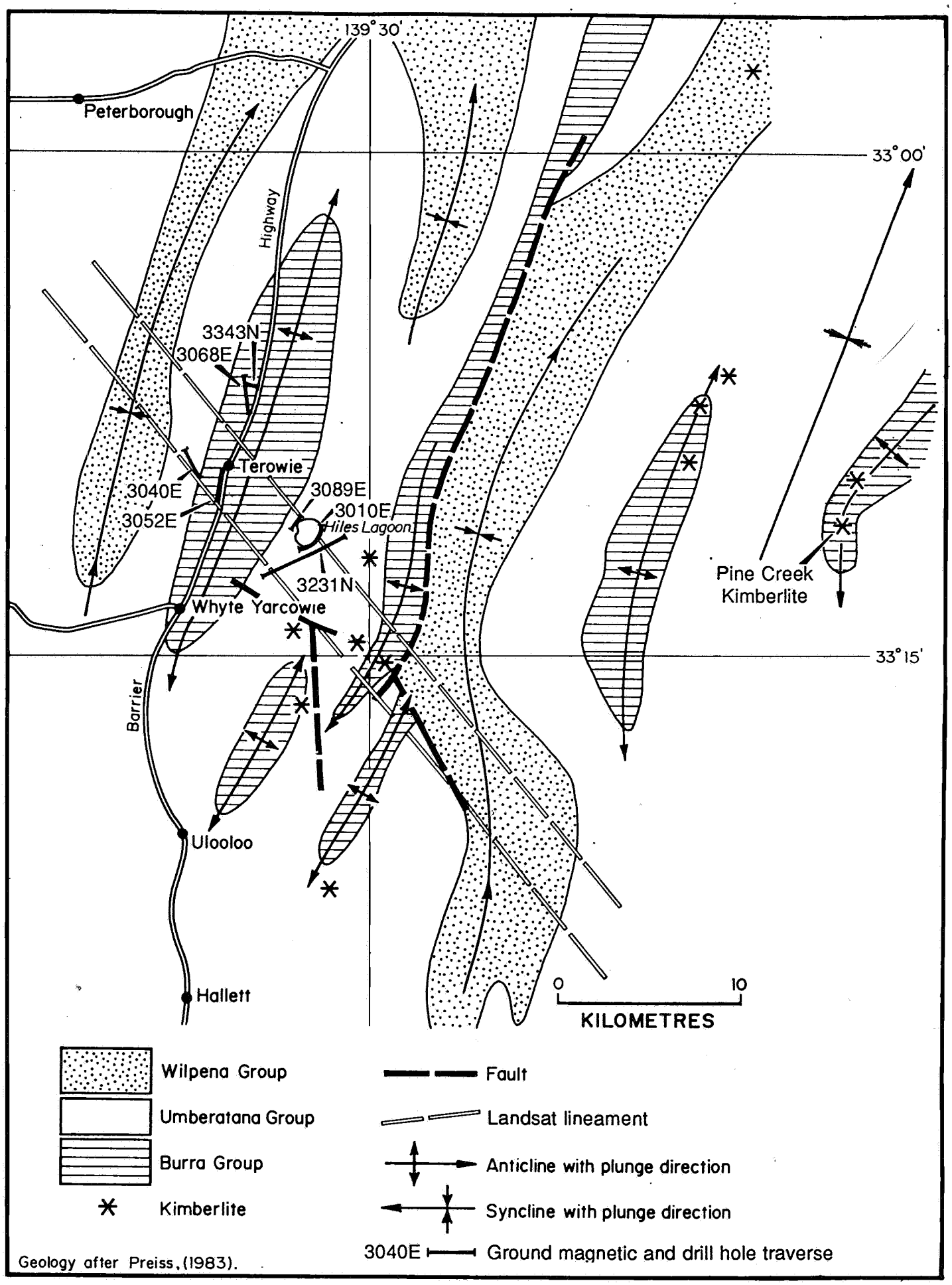
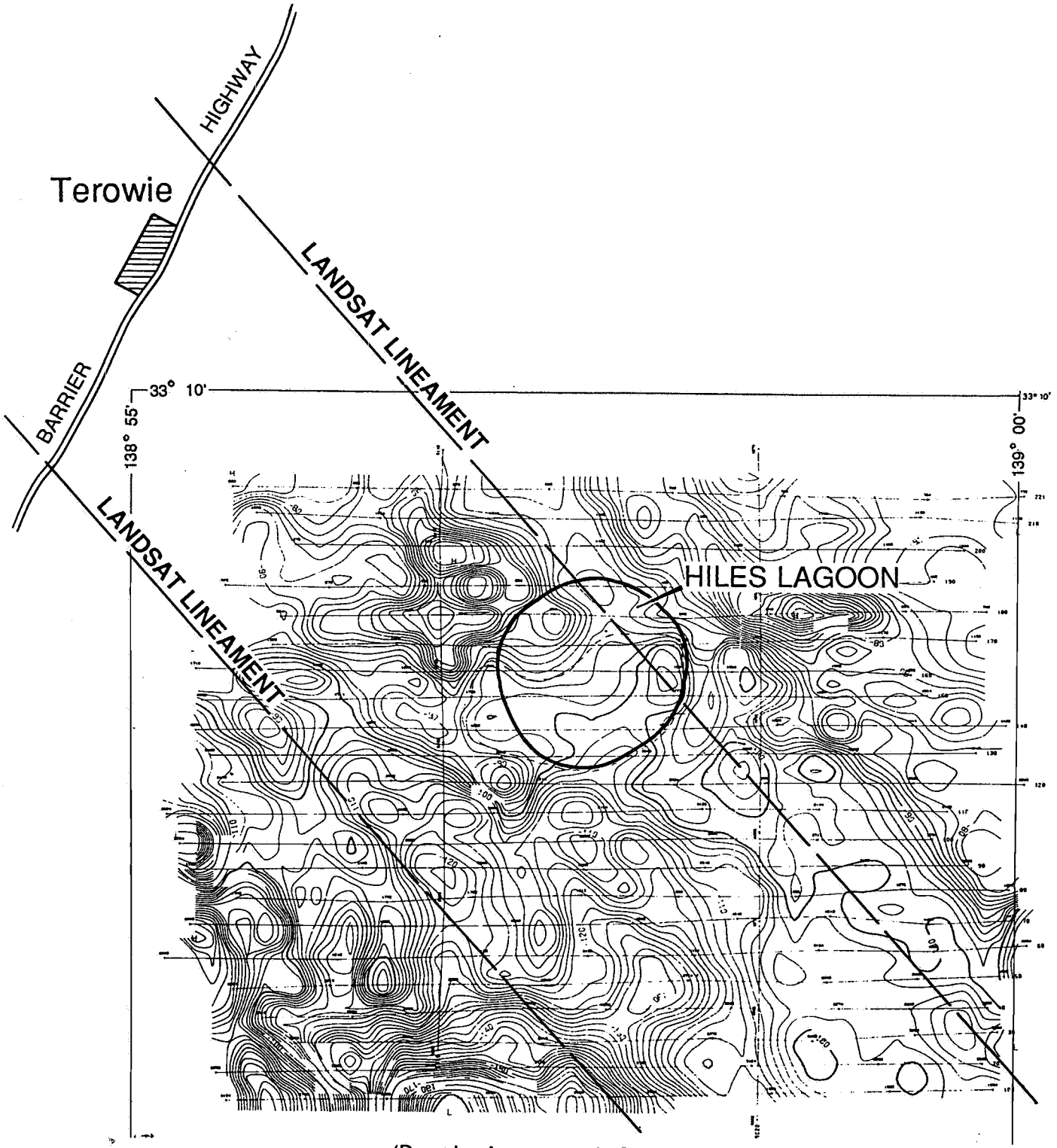


Fig. 2 BURRA-NACKARA ARC BEDROCK DRILLING, TEROWIE AREA

Regional Geology Plan

DME_SA 93-1393



(Dampier Aeromagnetic Survey, SADME Env. 3475)

0 1 2

KILOMETRES

Fig. 3 BURRA-NACKARA ARC BEDROCK DRILLING, TEROWIE AREA
AEROMAGNETIC CONTOURS

DME_SA 93-1394

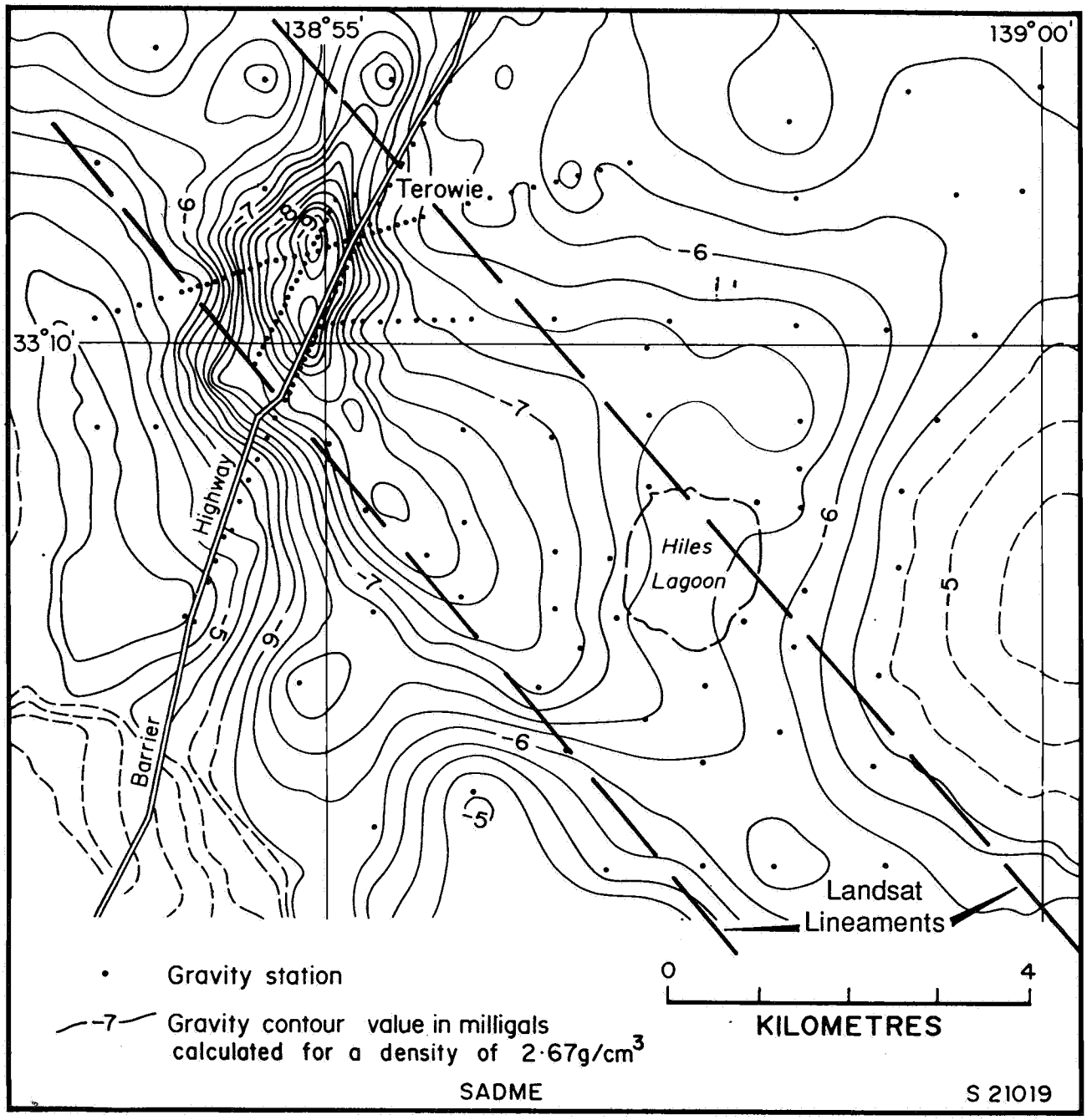


Fig. 4 BURRA-NACKARA ARC BEDROCK DRILLING, TEROWIE AREA.
Bouguer Gravity Contours

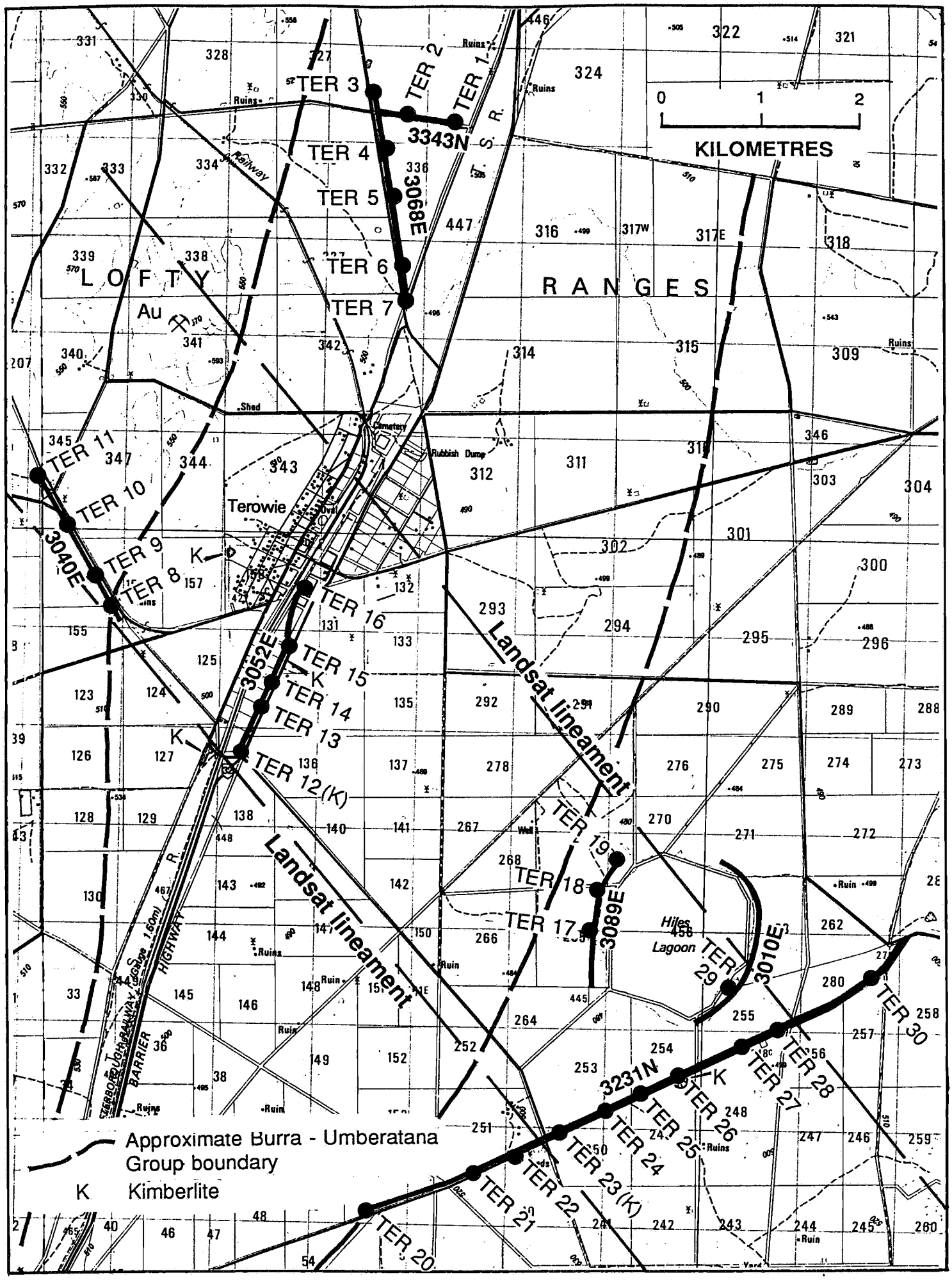


Fig. 5 BURRA-NACKARA ARC BEDROCK DRILLING, TEROWIE AREA

DRILLHOLE LOCATIONS

DME_SA 93-1396

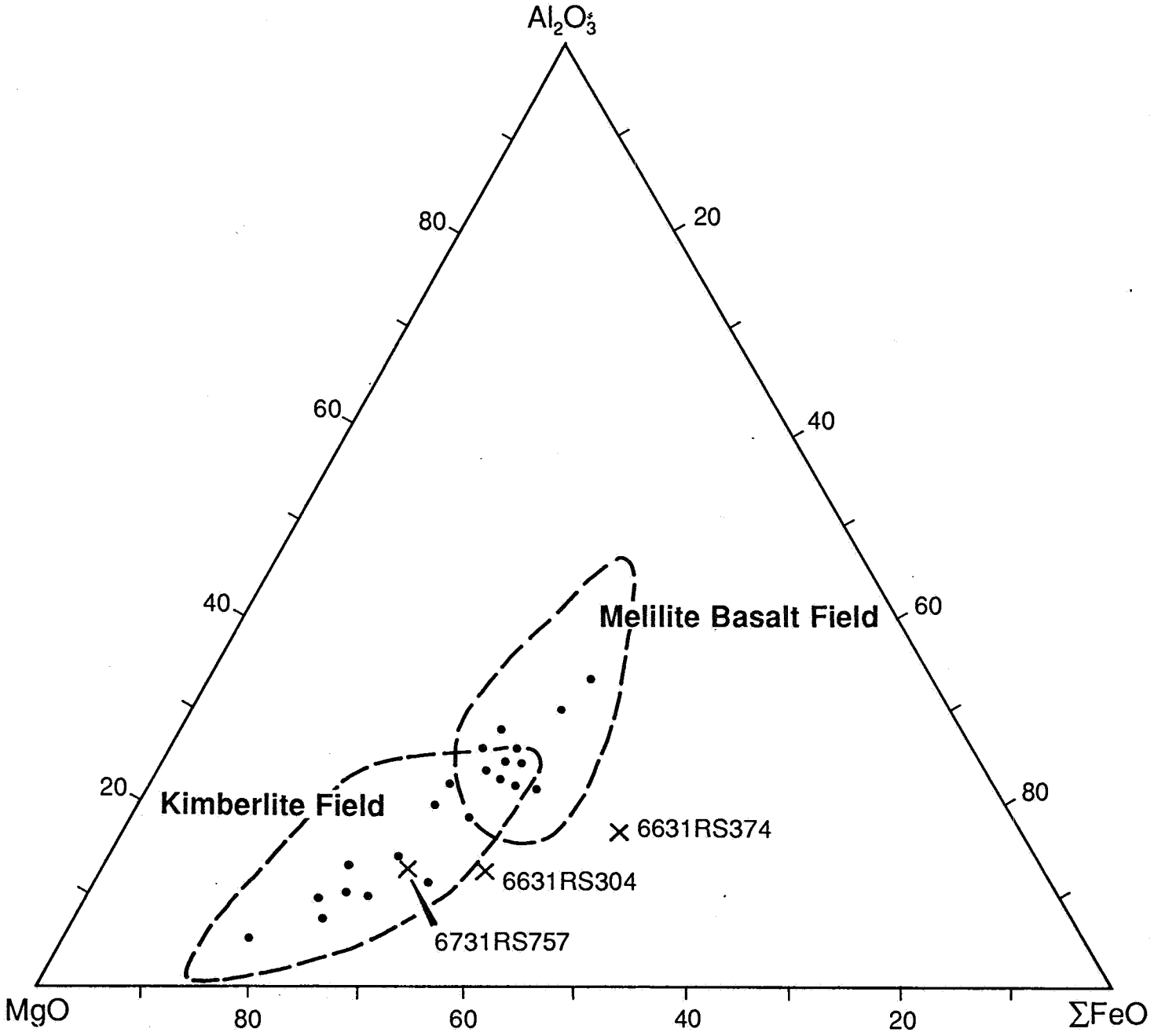


Fig. 6 BURRA-NACKARA ARC BEDROCK DRILLING, TEROWIE AREA
Al_2O_3 - MgO - total FeO diagram for kimberlitic rocks of south eastern Australia (after Ferguson, 1980)

DME_SA 93-1397