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EL 1018

ROGER CORNER

PROGRESS AND FINAL REPORTS TO LICENCE EXPIRY/SURRENDER FOR THE PERIOD 28/7/1982 TO 27/1/1984

Submitted by
Aberfoyle Exploration Pty Ltd
1984

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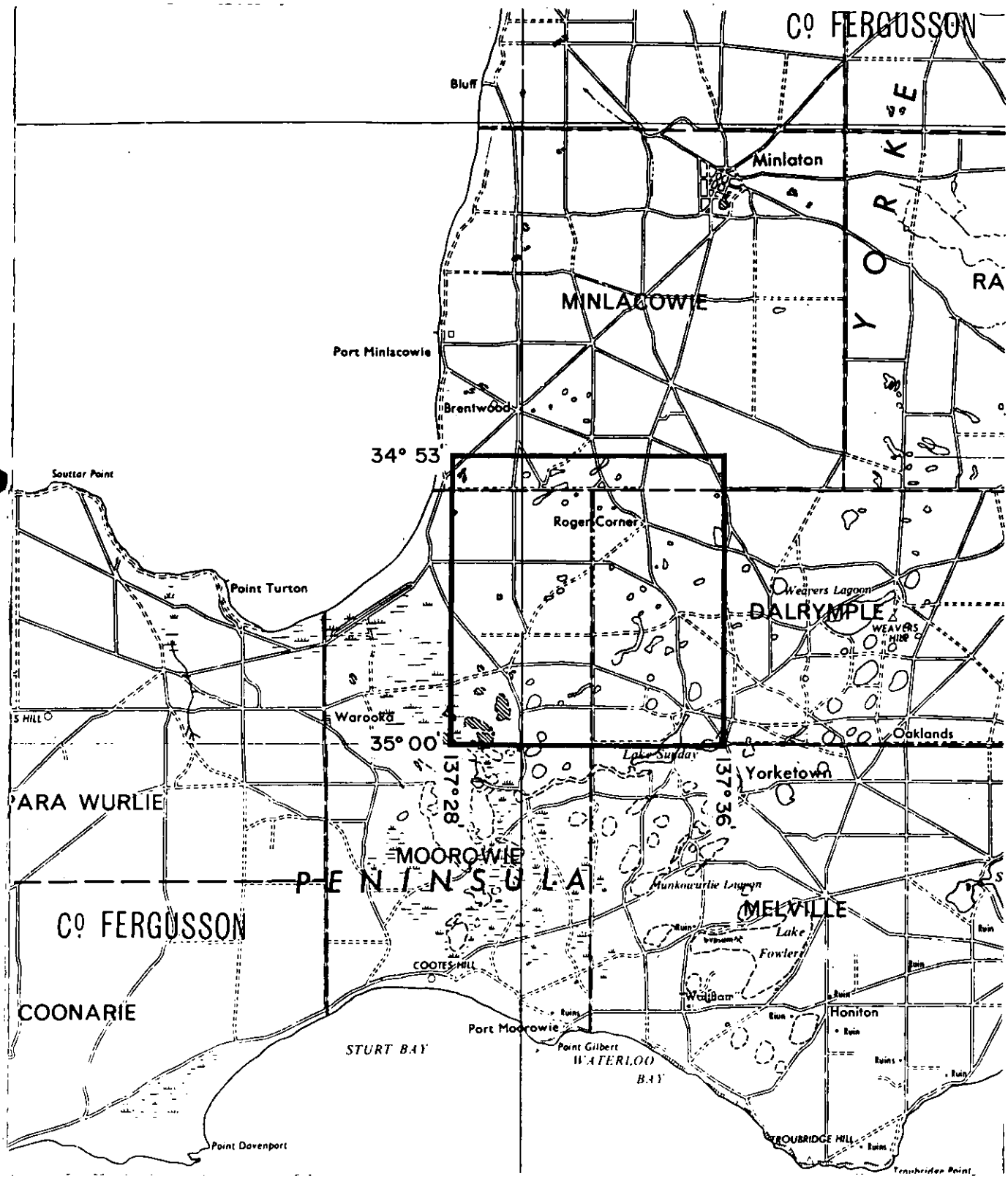
Government of South Australia
Primary Industries and Resources SA

SCHEDULE A



SCALE 1:250,000

KILOMETRES 5 0 5 10 15 20 25 KILOMETRES

EXPIRED

APPLICANT: **ABERFOYLE EXPLORATION PTY LTD**

DM: **103/82** AREA: **158** square kilometres

1:250000 PLANS: **MAITLAND**

LOCALITY: **ROGER CORNER AREA – Approx. 25 km N.W. of Edithburgh.**

DATE GRANTED: **28·7·82** DATE EXPIRED: **27·7·83** EL No: **1018**

CONTENTS ENVELOPE 4841

TENEMENT: E.L. 1018 - Roger Corner.

TENEMENT HOLDER: Aberfoyle Exploration Pty. Ltd.

PLANS:	Roger Corner Seismic Refraction Survey Interpreted Data Values. Plan No. 83-387. Fig. 4.	4841-10
REPORT:	Quarterly Report Period Ending 28-1-84.	Pgs. 64-71
PLANS:	Roger Corner Location Plan. Plate No. RC10.	Pg. 67

Env 4841

EL1018. Roger Corner, Yorke Peninsula. Progress and final reports from 28 October 1982 - 15 February 1984.
71 pages incl. 3 figs., 10 maps.
Author: Aberfoyle Exploration Pty. Ltd.

Map area: MAITLAND (SI53-12/6428-3, 6328-2).

Target was Moonta-type Cu (-Mo-Au) over a groundwater anomaly (Cu, Ag and Ba) adjacent to an aeromagnetic anomaly, northwest of Yorketown. No conclusions were reached on the groundwater anomaly and testing of the magnetic anomaly would require a deep drillhole, interpreted to intersect Cambrian or Lincoln Complex gneisses below Permian.

Keywords: Mineral Exploration-SA/Base metals exploration/Geochemical exploration/Groundwater sampling/Water chemistry/Salinity/Assay value/Geophysical surveys/Ground magnetic surveys/Seismic refraction method/Roger Corner/Yorke Peninsula.

RB 826

Cockshell, C.D., 1983 (August). Roger Corner seismic refraction survey for Aberfoyle Exploration Pty. Ltd. 18 pages, (including 2 fig, 7 ref), 2 sections. Also in Env. 4841.

Map area: MAITLAND (SI53-12:6428-3).

Seismic profile over coincident hydrochemic aeromagnetic anomaly interpreted as Archaean metamorphic basement or Cambrian carbonate unit underlying Quaternary, Tertiary and Permian units.

Keywords: Mineral Exploration-SA/Geophysics/Base metals exploration/Geophysical surveys/Seismic refraction method/Seismic interpretation/Roger Corner/Yorketown.

F

0003

ABERFOYLE EXPLORATION PTY. LTD.

Exploration Licence No. 1018

ROGER CORNER

Yorke Peninsula

Report for the First Quarter ending

28 October, 1982

Adelaide

12 November 1982

Report by: I.B. Freytag

Geologist

Aberfoyle Exploration Pty. Ltd.

1. INTRODUCTION

Interest in the Roger Corner area on southern Yorke Peninsula was stimulated by work conducted by the South Australian Department of Mines and Energy in the field of trace heavy metal contents in groundwaters.

On the basis of hydrogeochemical results from a coarse grid of observation wells throughout South Australia, southern Yorke Peninsula was defined as one of several districts with significant groundwater metal anomalies (Morris, 1982).

The observation well DAL 2 at Roger Corner, northwest of Yorketown, registered anomalous Cu (4,350 ppb), Ag (4 ppb) and Ba (250 ppb). It is situated at the northeastern end of a particular, discrete aeromagnetic anomaly. These factors combined provided the basis for an exploration concept and a proposal for further investigation of the area.

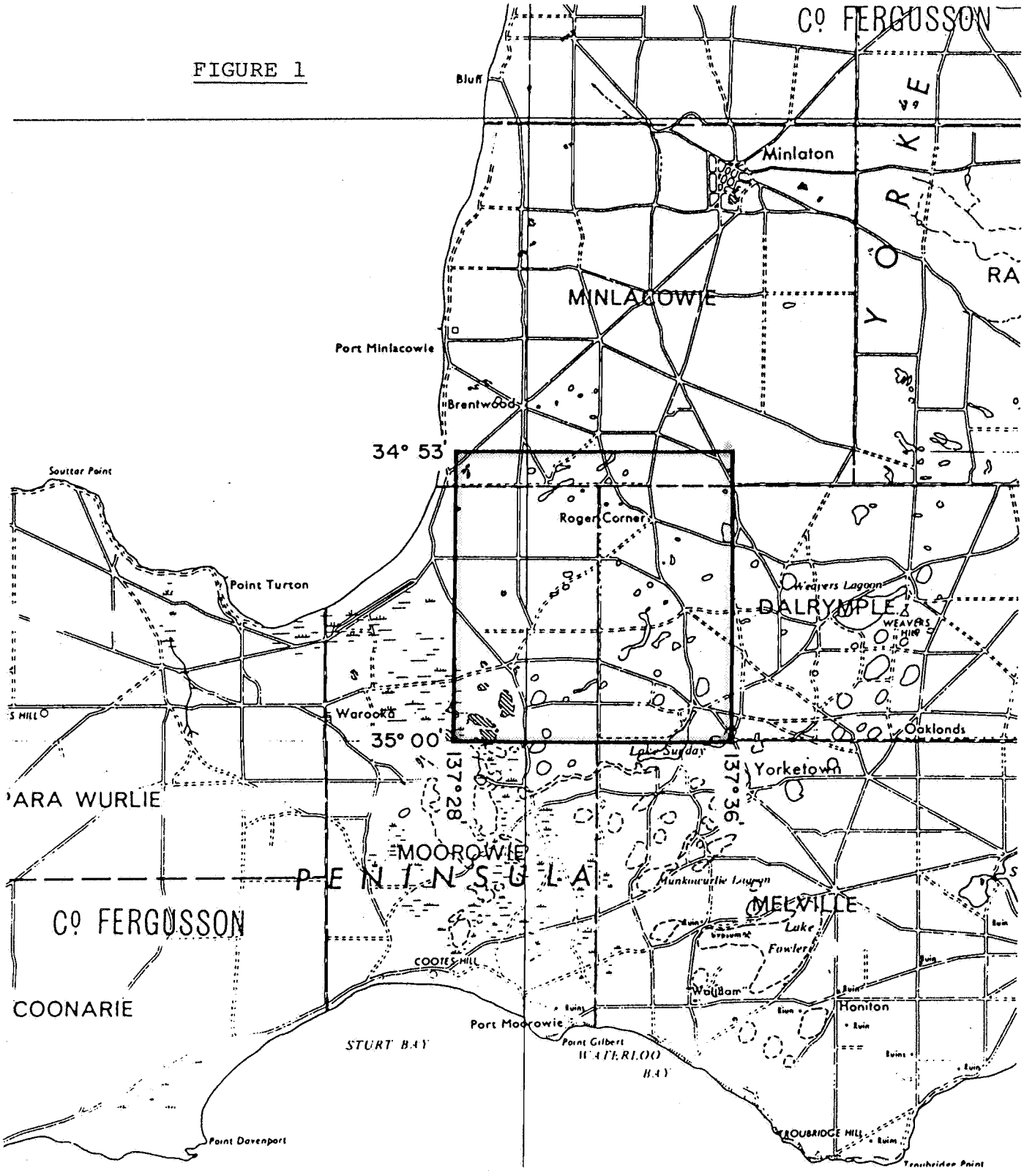
Aberfoyle was granted an exploration licence on 28 July, 1982. This, the first quarterly progress report, deals with preparatory work for planned geophysical and hydrogeochemical surveys.

2. TENEMENT DETAILS

Exploration Licence 1018 was granted on 28 July 1982 for a period of twelve months. It covers 158 square kilometres of gently undulating cereal lands from about 5 to 15 kilometres to the northwest of Yorketown. The exploration licence covers some 75 farm holdings.

Surface drainage in this district is poorly developed, and most of the stockwater is derived from shallow bores

FIGURE 1



SCALE 1:250,000

KILOMETRES 5 0 5 10 15 20 25 KILOMETRES

APPLICANT: ABERFOYLE EXPLORATION PTY LTD

DM: 103/82 AREA: 158 square kilometres

1:250000 PLANS: MAITLAND

LOCALITY: ROGER CORNER AREA – Approx. 25 km N.W. of Edithburgh.

DATE GRANTED: DATE EXPIRED: EL No: 1018

and wells. Current S.A.D.M.E. records indicate that about 70 of the bores located in the licence area have been operative in more recent times, and that about 40 of these may be suited to groundwater sampling.

3. PREVIOUS EXPLORATION

It appears that no mineral exploration has been done in the licence area. There is no hardrock exposure. The land surface is covered largely by surficial Quaternary deposits, and a few Tertiary remnants. Permian sediments of unknown thickness underlie the Cainozoic and the nature of pre-Permian rocks is undetermined.

4. WORK THIS QUARTER

1) Introductory Borewater Geochemistry

Fifteen bores in the licence area were sampled in reconnaissance and analysed for F, U, Mo, Cu, Pb and Zn (see Fig.3).

The determinations were done by A.C.S. Laboratories, Unley, S.A. as follows:

Bore Number	F ppb	U ppb	Mo ppb	Cu ppb	Pb ppb	Zn ppb
YPW3	90	<1.0	<1	10	<1	46
YPW4	85	<1.0	<1	106	8	7
YPW5	35	<1.0	<1	140	3	325
YPW6	160	13.5	1	100	7	365
YPW7	125	3.7	<1	6	1	34
YPW8	135	26.5	1	6	3	14
YPW9	130	7.6	<1	60	2	93
YPW10	75	3.3	<1	500	42	49
YPW11	280	17.5	<1	240	1	58
YPW12	170	14.0	<1	6	12	7
YPW13	160	5.8	4	70	1	22
YPW14	215	8.8	<1	115	<1	16
YPW15	195	9.7	2	4	1	4
YPW16	180	3.0	<1	10	3	35
YPW17	110	2.9	<1	4	1	7

These results have not been normalised against total dissolved solids - the intention in this sampling was to obtain an early indication as to whether the high trace metal content in observation bore DAL 2 is more widespread in the licence area. All of the above borewaters will be re-sampled and analysed during the course of the planned routine sampling programme.

It seems, however, that values of 500 ppb Cu and 42 ppb Pb in bore YPW10; 240 ppb Cu and 17.5 ppb U in YPW11; and 26.5 ppb U in YPW8 could be anomalous.

2) Magnetic Anomaly

The Roger Corner magnetic anomaly was defined in the regional airborne survey of the MAITLAND 1:250,000 Sheet (see Fig.2). Flight line spacing was nominally 1.6 kilometres.

In order to define the gross characteristics of this anomaly more reliably, a ground magnetometer survey has been designed, as shown in Figure 3. Stations at 50 metre intervals are to be read on the lines indicated.

3) Landowner Contact

The search of the 70-odd farm holdings for ownership has been completed, and Notice of Entry procedures are in progress.

5) FUTURE PROGRAMME

The work programme planned for the forthcoming second quarter includes:

1) the sampling of as many bores in the licence area as can produce a satisfactory groundwater sample using recognised sampling procedures;

2) commencement of the reconnaissance ground magnetometer traverses, as access to cropped areas permits. The magnetic data will be interpreted to decide whether further detailing of the anomaly is warranted.

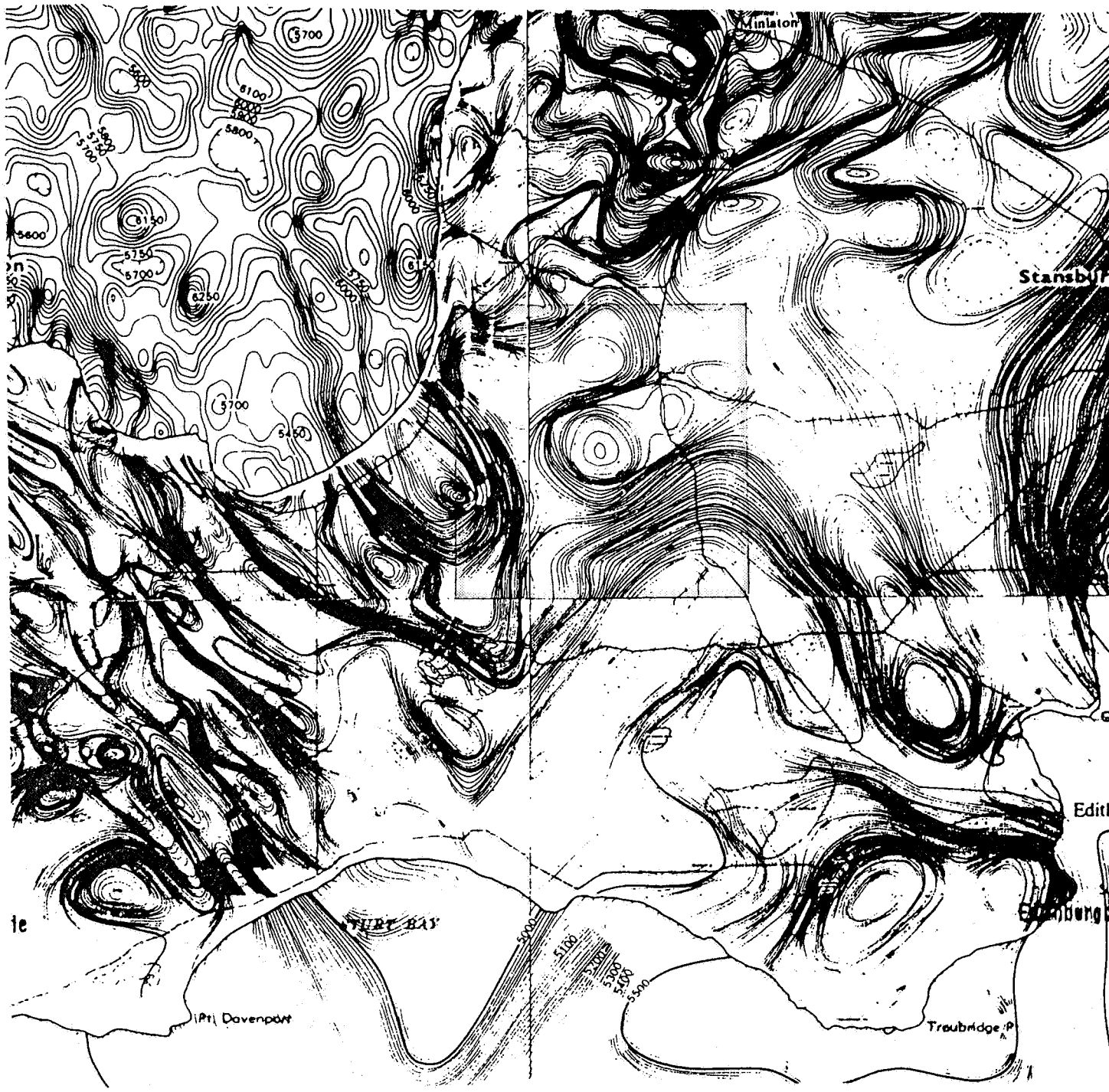


FIGURE 2

Regional aeromagnetic map of total intensity, Lower Yorke Peninsula, showing Exploration Licence 1018 and the disposition of the Roger Corner magnetic anomaly.

(Magnetic data copied from SADME 1:250,000 aeromagnetic sheets MAITLAND and KINGSCOTE)

FIGURE 3

4841-1

0009

6) REFERENCES

Morris, B.J. (1982) A Hydrogeochemical Study of Groundwater in South Australia and its Application to Mineral Exploration. S.A.D.M.E. Rep. 82/12 (unpubl.)

Signed: _____

I.B. Freytag
District Manager

Dist: Department Mines & Energy (1)
Concept (1)
Hawthorn (1)
Adelaide (1)

IBF:JF

EXPLORATION LICENCE 1018

ROGER CORNER

Statement of Expenditure for the Quarter ending 28 October 1982

	$
Salaries and Wages	1,005
Materials	64
Vehicle and fuel expenses	57
Tenement expenses	237
	1,363
Administration and overheads	204
	1,567

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0011

ABERFOYLE EXPLORATION PTY. LTD.

EXPLORATION LICENCE No. 1018

ROGER CORNER

Yorke Peninsula

Report for the Second Quarter
ending
28th January 1983

Adelaide

February 1983

Report by: M.G. Teakle
Geologist
Aberfoyle Exploration Pty.Ltd

CONTENTS

0013

1. INTRODUCTION

A statewide groundwater sampling programme for trace heavy metal contents was carried out by the South Australian Department of Mines and Energy in 1979 and 1980. Southern Yorke Peninsula was one of several areas reported to have significant groundwater metal anomalies (Morris, 1982).

Anomalous Cu Ag and Ba trace contents were reported in observation well DAL2 at Roger Corner (Figure 1). This well is situated adjacent to a discrete aeromagnetic anomaly defined on the S.A.D.M.E. MAITLAND 1:250,000 aeromagnetic sheet. The source of this anomaly is unknown. The situation prompted Aberfoyle's interest in the Roger Corner area and, accordingly, Exploration Licence 1018 was secured on 28 July 1982 for a period of 12 months.

The work programme so far has included the obtaining of landowner consent to access, and a rapid reconnaissance hydrogeochemical survey, undertaken with the aim of determining whether anomalous trace metal values recorded in Roger Corner bore DAL2 were obviously more widespread in the licence area. Results of this reconnaissance survey are contained in the first quarterly progress report by Freytag (1982).

Following encouraging results from the reconnaissance sampling programme, a more extensive hydrogeochemical survey has been conducted within the licence during the second quarter. This, the second quarterly progress report, describes that work.

2. HYDROGEOCHEMICAL SURVEY

This has been a fairly detailed survey, with an element of experimentation. The aim was to confirm the presence of geochemically anomalous levels of trace heavy metals in the groundwater and, hopefully, to define an anomaly which might relate to buried mineralisation.

It was considered that a hydrogeochemical anomaly in proximity to the Roger Corner magnetic high would provide encouragement for drill testing, geological parameters being favourable.

A number of factors should be considered in assessing the significance of bore water geochemistry in the Roger Corner area:

1. Potentially mineralised rocks (Cambrian and older) are believed to be overlain by a Permian sedimentary cover of uncertain thickness.

2. The aquifer(s) sampled is shallow and 7.92 metres is the maximum recorded depth of bores sampled. The average depth of well or bore in the area is 3.68 metres.

3. The potential contribution to trace element geochemistry of metal contaminants such as brass, copper or galvanised fittings at the well- or bore-site is currently conjectural, but these could be a significant source of dissolved Cu Zn and possibly Pb in groundwater.

4. The E.L. area sampled is small and the results may not provide a true indication of background and anomalous geochemical levels in the region.

a) Procedure

Seventy four bores are recorded on South Australian Department of Mines and Energy 1:50,000 well location plans covering the Roger Corner licence. A further 51 unrecorded bores and wells were located during the course of the survey. Of this total of 125 bores, 73 were sampled as shown in Figure 2. The remainder were not accessible, either because they were no longer operational, had been filled in, or were completely enclosed.

Sampling was carried out by technician C.R. Willmer in the period December 1982 to January 1983.

The sampling procedure adopted is shown diagrammatically in Figure 3 and follows procedures recommended by the Environment Protection Authority "Guide to the Sampling and Analysis of Water and Wastewater" (1979). Observations on the state of each bore, and possible sources of metal contamination such as brass, copper, or galvanised fittings, were recorded.

Analyses for Cu Pb Zn Hg F and U and T.D.S. (Total Dissolved Solids) determinations were carried out by Comlabs within 30 days of sample collection. The results are listed in Appendix A. pH was read with a Selby's meter. The following analytical methods were used:

Cu Pb Zn	by A.A.S.
Hg	by vapour or hydride generation/A.A.S.
F	by selective ion electrode analysis
U	by radiometric/equilibrium analysis
T.D.S.	by conductivity measurements.

WATER BORE SAMPLING PROCEDURE AT ROGER CORNER

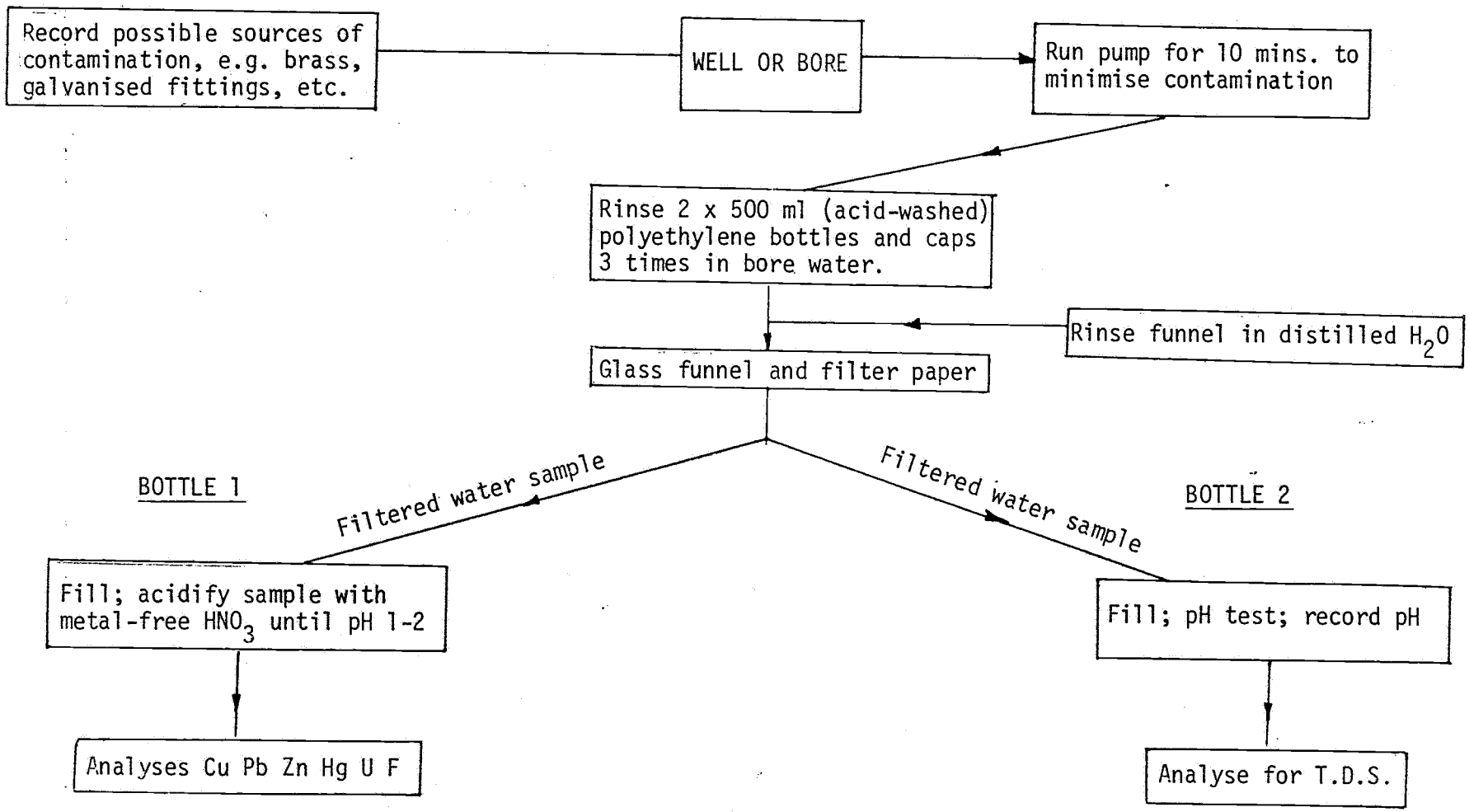


FIGURE 3

34°53'S

137° 28' E

137° 36' E

35°00'S

TN MN

6°30'

ROGER CORNER

RC 69 4950
RC 67 5150
RC 68 3800
RC 66 3700
RC 70 1500
RC 71 1500
RC 40 2650
RC 43 1250
RC 65 4100
RC 39 6500
RC 46 3650
RC 44 4350
RC 45 2500
RC 47 1950
RC 41 1600
RC 31 1600
RC 32 1450
RC 33 1800
RC 34 1900
RC 42 2780
RC 51 4300
RC 35 7350
RC 12 3950
RC 15 10400
RC 73 6900
RC 72 8750
RC 13 6350
RC 38 6050
RC 16 7650
RC 14 9350
RC 10 8100
RC 2 9350
RC 62 7700
RC 50 5600
RC 64 7250
RC 3 10600
RC 4 24800
RC 37 5400
RC 5 7050
RC 63 7800
RC 1 8500
RC 7 4150
RC 6 5100
RC 8 7900
RC 61 8900
RC 59 7150
RC 17 4900
RC 18 5250
RC 36 7900
RC 9 3000
RC 19 4650
RC 20 3900
RC 58 27500
RC 29 6100
RC 28 3900
RC 27 3450
RC 48 3450
RC 23 4650
RC 57 7000
RC 49 1950
RC 26 5200
RC 24 7350
RC 25 1850
RC 30 3950
RC 21 10000
RC 22 12000
RC 56 2650
RC 52 3300
RC 53 1700
RC 54 2650
RC 55 4000
RC 60 21500

2000 4000 6000 8000 10000

SOUTH AUSTRALIA

Port Augusta
Port Lincoln
Adelaide
ROGER CORNER

LOCATION PLAN

Buildings

Road

Lease boundary

Water bore
water sample N°
Total dissolved solids (mg/L)
RC 53
1700

Contours, Total Dissolved Solids
6000
4000

Aeromag. Anomaly, Outline

T.D.S determined from conductivity readings

Km 0 0·5 1·0 1·5 2·0 Km

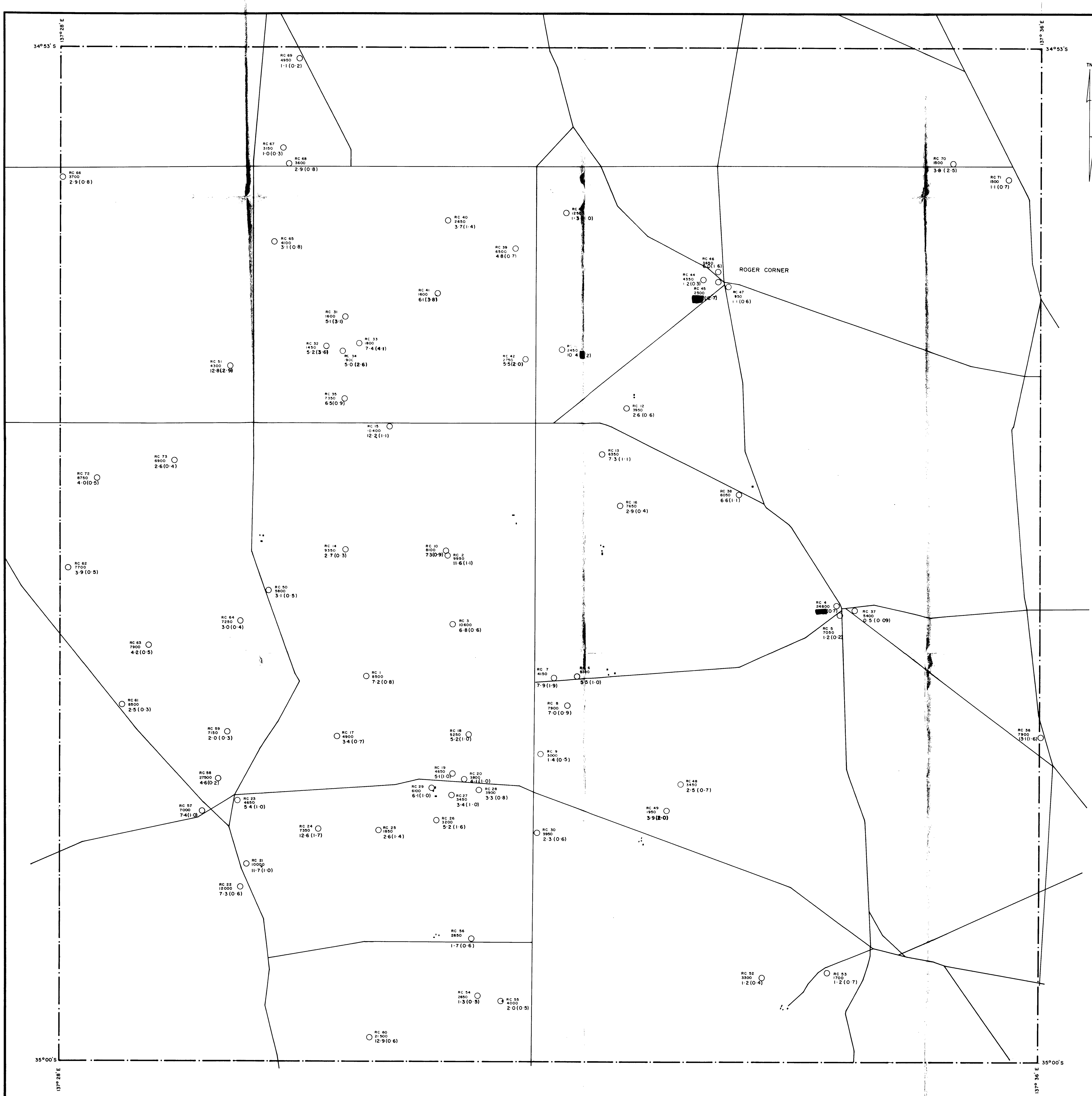
FIGURE 2

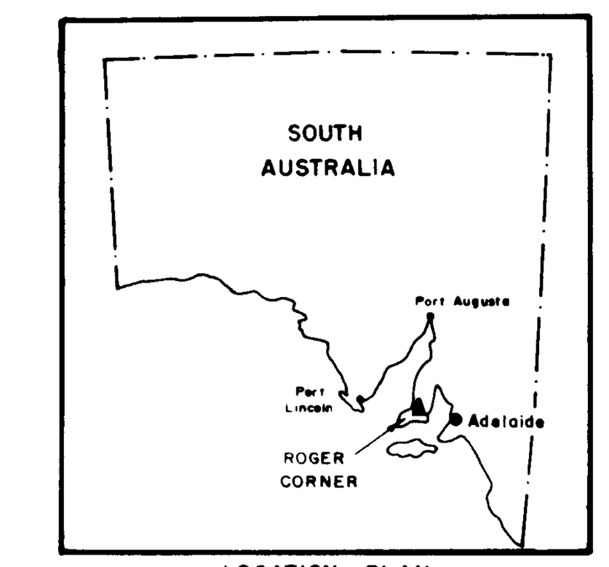
Aberfoyle Exploration Pty Ltd

Geology:	
Drawn: CRW	SOUTH AUSTRALIA ROGER CORNER E.L. 1018 HYDROGEOCHEMICAL SURVEY Location of Bores & Groundwater Salinity Contours
Traced: JB	
Checked: MGT	
Standard Sym Status	

Location code: 153/12
Date: FEB 83
Scale: 1:20,000
Plate N°
RC 7

4841-2





LOCATION PLAN

Buildings	
Road	
Lease boundary	
Water bore Water sample N° Total dissolved solids (mg/L)	RC 53 1700
Uranium assay ppb (Normalized value)	6·6 (1·0)
Anomalous assay Anomalous normalized assay	

Analysis of water samples by radiometric/equilibrium technique at COMLABS.

Total dissolved solids derived from conductivity readings

Km 0 0·5 1·0 1·5 2·0 Km

FIGURE 4

Aberfoyle Exploration Pty Ltd

Geology:	SOUTH AUSTRALIA ROGER CORNER E.L. 1018	Location code: I 53/12
Drawn: CRW		Date: FEB 1983
Traced: JB	BOREWATER GEOCHEMISTRY	Scale: 1:20,000
Checked: MGT	URANIUM	Plate N° RC 5
Revised by: Date:		

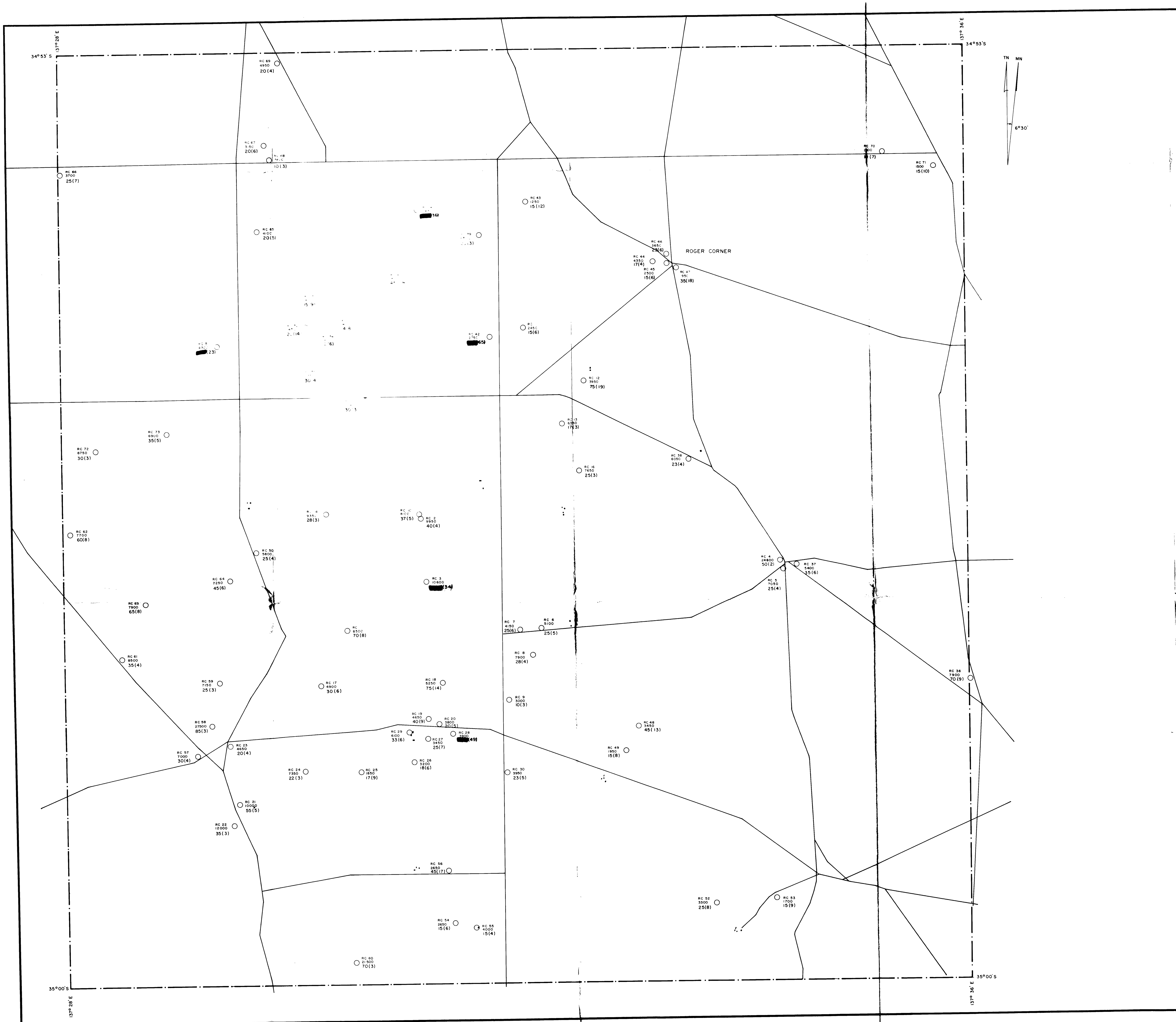
4841-3

FIGURE 5

4841-4

Aberfoyle Exploration Pty Ltd

Geology:	SOUTH AUSTRALIA ROGER CORNER E.L. 1018	Location code: 153/12
Drawn: CRW		Date: FEB 1983
Traced: JB	BOREWATER GEOCHEMISTRY	Scale: 1:20,000
Checked: MGT	ZINC	Plate N° RC4
Revised by: Date:		



Buildings

Road

Lease boundary

Water bore
Water sample Nº
Total dissolved solids (mg/L)
RC 53
1700
25(3)

Copper assay p.p.b.
(Normalized value)

Anomalous assay
Anomalous normalized assay

Analysis of water samples by AAS at COMLABS

Total dissolved solids derived from conductivity readings

Km 0 0·5 1·0 1·5 2·0 Km

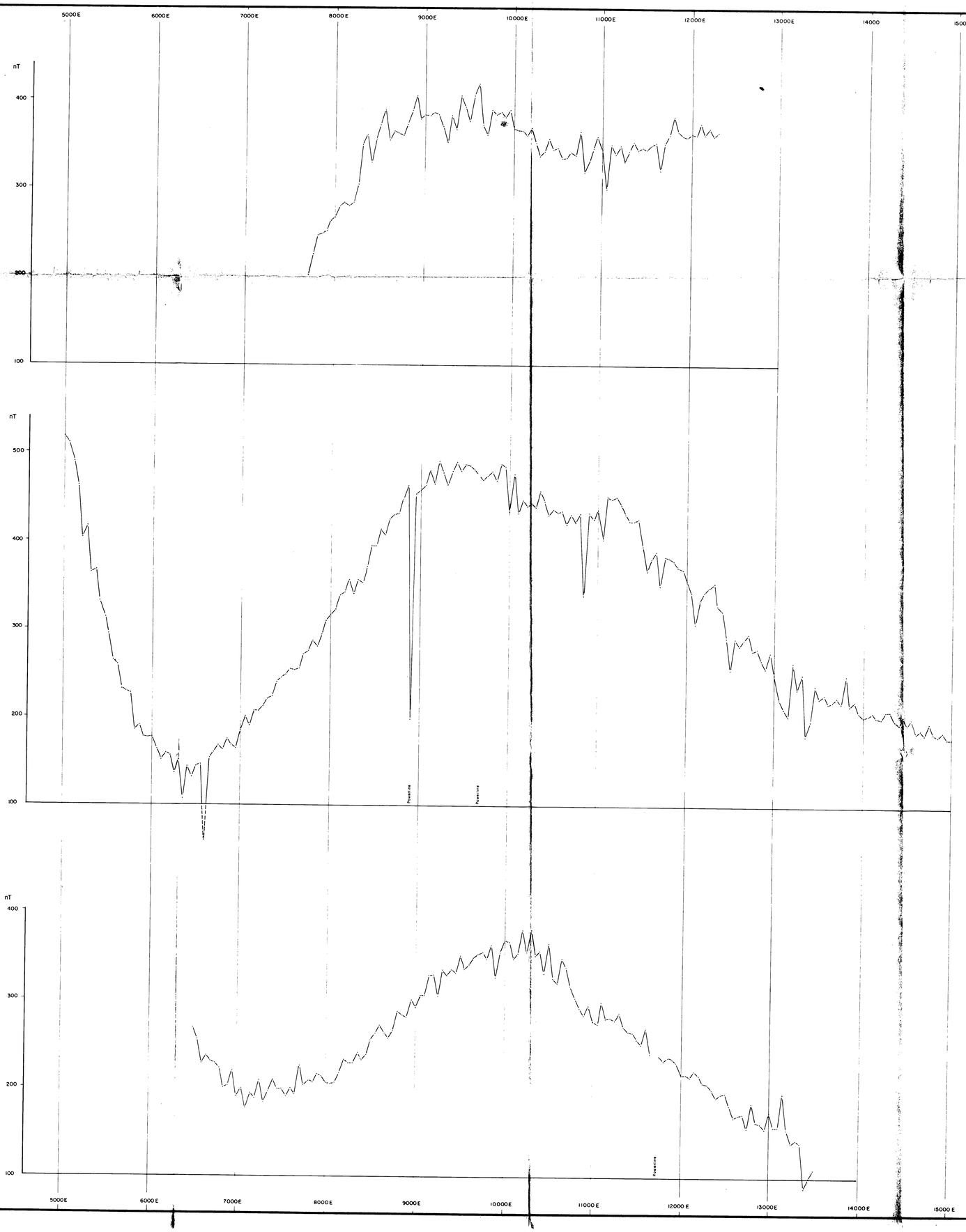
FIGURE 6

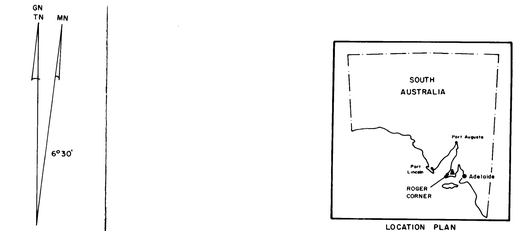
Aberfoyle Exploration Pty Ltd

Geology:	SOUTH AUSTRALIA ROGER CORNER E.L. 1018	Location code: I 53/12
Drawn: CRW		Date: FEB 1983
Traced: JB	BOREWATER GEOCHEMISTRY	Scale: 1:20,000
Checked: MGT	COPPER	Plate Nº RC 3
Revised by: Date:		

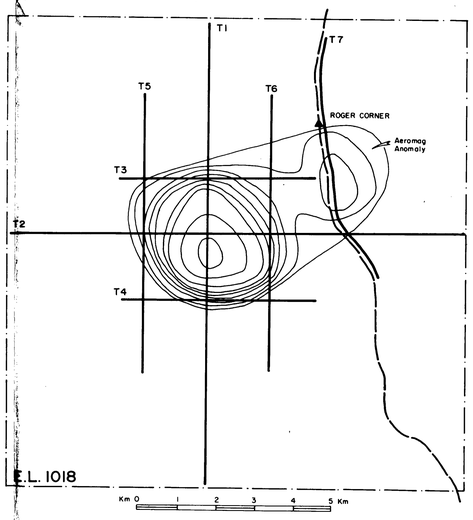
4841-5

34°53'S
137°28'E
137°36'E
35°00'S
ROGER CORNER
SOUTH AUSTRALIA
Port Augusta
Port Lincoln
Adelaide
ROGER CORNER
LOCATION PLAN
TN
MN
6°30'
Buildings
Road
Lease boundary
Water bore
Water sample N°
Total dissolved solids (mg/L)
RC 53
1700
Fluorine assays ppm
(Normalized value)
2·3 (0·3)
Anomalous assay
Anomalous normalized assay
Analysis of water samples by S.I.E at COMLABS
Total dissolved solids derived from conductivity readings
Km 0
0·5
1·0
1·5
2·0 Km
FIGURE 7
4841-6
Aberfoyle Exploration Pty Ltd
Geology:
Drawn: CRW
Traced: JB
Checked: MGT
Revised by:
Date:
SOUTH AUSTRALIA
ROGER CORNER
E.L. 1018
BOREWATER GEOCHEMISTRY
FLUORINE
Location code: I53/12
Date: FEB 1983
Scale: 1:20,000
Plate Nº
RC 6





LOCATION PLAN



Readings at 50m stations using a
Ballard Proton Precession Magnetometer

Km 0 0·5 1·0 1·5 2·0 Km

FIGURE 2

4841-7

Aberfoyle Exploration Pty Ltd		
Geology:	SOUTH AUSTRALIA ROGER CORNER E.L. 1018 GROUND MAGNETIC PROFILES LINES T2, T3, T4	Location code: 153/12
Drawn: CRW		Date: APRIL 1983
Traced: JB		Scale: 1cm = 20nt 1: 20,000
Checked: MGT		Plans No RC 9 B
Revised by: Date:		

FIGURE 3

4841-8

Aberfoyle Exploration Pty Ltd		
Geology:	SOUTH AUSTRALIA ROGER CORNER E.L. 1018 GROUND MAGNETIC PROFILES LINES T1, T5, 6, 7	Location code: I53/12
Drawn: CRW		Date: APRIL 1983
Traced: JB		Scale: 1cm = 20nT 1:20,000
Checked: MGT		Plate Nº RC 9A
Revised by: Date:		

Analytical results in micrograms/litre were normalised to a 1000 mg/litre level of T.D.S. Both actual and normalised results are plotted in Figures 4, 5, 6 and 7. Salinity contours are shown on Figure 2.

b) Results

Salinity: Total dissolved solids content in the groundwaters sampled generally ranges from 2,000 to 7,000 mg/l with a small proportion of values up to 10,000 mg/l.

Salinity contours shown in Figure 2 define a salinity high in the central part of the licence area, and ridging to the southwest.

The main high straddles the position of the Roger Corner aeromagnetic anomaly, but the significance of this relationship is not known at present.

Trace Metals: Using simple frequency plots, arbitrary anomaly thresholds for both actual and normalised Cu, Zn, U and F were obtained:

Arbitrary Anomaly Thresholds

Element	Actual	Normalised
Zn	130 ppb	35 ppb
U	14 ppb	2 ppb
Cu	90 ppb	25 ppb
F	2.1 ppm	1.0 ppm

Using these thresholds, the anomalous bores are shown on Figures 4, 5, 6 and 7, and are discussed below.

COPPER (Figure 6)

Figure 2 shows a salinity high straddling the Roger Corner aeromagnetic anomaly. Spot anomalous copper values occur to the north and south of the salinity/magnetic anomaly, and in bore RC3, occurring within the magnetic anomaly. RC3 gave the maximum copper result of 360 ppb. It is noted that actual and normalised Cu anomalies coincide fairly well.

ZINC (Figure 5)

As with copper, there appears to be a concentration of zinc anomalies on the north and south flanks of the magnetic anomaly. Two bores, RC2 (130 ppb Zn) and RC3 (215 ppb Zn) are anomalous in zinc within the magnetic anomaly. There is a mixed correlation between anomalous zinc and the normalised values. The maximum Zn value occurs at RC 39 (1500 ppb Zn) coinciding with a spot T.D.S. 'high' (>6,000 mg/l T.D.S.).

URANIUM (Figure 4)

Only two bores (RC45 and RC4) are anomalous, but normalising of the uranium analyses defined a group of anomalies to the north of the magnetic/salinity high. The maximum uranium assay occurs at RC45 (31.8 ppb U).

FLUORINE (Figure 7)

Defined fluorine anomalies are randomly distributed in the licence, although as with the other anomalous elements, there is some suggestion of a grouping of anomalous fluorine on the northern and southern flanks of the salinity high. The maximum fluorine assay occurs at RC68 (3.9 ppm).

0019

MERCURY, LEAD

Hg and Pb results were all below the limit of detection and these metals play no part in this evaluation.

3. CONCLUSIONS

The results of this survey have failed to verify the order and diversity of metal anomalies recorded in reconnaissance, but this may be attributable to variations in sampling method, and laboratory and analytical techniques used.

No firm conclusions are drawn about the validity of the trace metal groundwater anomalies as defined in this report, or their geological significance.

Notwithstanding the lower density of sample points over the Roger Corner aeromagnetic anomaly itself, there is no reasonable indication of a significant anomaly in the metals analysed which, together with the magnetic anomaly, might suggest the presence of underlying mineralisation.

However, detailing of the aeromagnetic anomaly is still recommended.

4. FUTURE WORK

1. Reconnaissance ground magnetometer traverses, as shown on Figure 1, to obtain more detailed data on the Roger Corner aeromagnetic anomaly for its accurate definition and interpretation.

2. Contingent upon the results of the reconnaissance magnetic survey, further detailed ground magnetometer traverses may be implemented to assist in defining a percussion drill target.

0020

REFERENCES

Environment Protection Authority (1979) A Guide to Sampling and Analysis of Water and Wastewater 3rd Edition, Report no.95/79

Freytag, I.B. (1982) E.L. 1018, Roger Corner; Report for the 1st Quarter ending 28 October 1982. Aberfoyle Explor. unpub.rept.

Morris, B.J. (1982) A Hydrogeochemical Study of Groundwater in South Australia and its Application to Mineral Exploration. S.A.D.M.E. Rept. 82/12 (unpub.)

Report by: M.G. Teakle

M.G. Teakle
Geologist

Issued by: I.B. Freytag

I.B. Freytag
District Manager

Dist: Dept.Mines (1)
Concept (1)
Hawthorn (1)
Adelaide (1)
MGT (1)

MGT:JF

EXPLORATION LICENCE 1018

ROGER CORNER

0121

STATEMENT OF EXPENDITURE FOR THE SECOND QUARTER

EXPENDITURE FOR THE 1st QUARTER			1,567
GEOLOGY			
Salaries	1,526		
Wages	45		
Materials	44	1,615	
GEOPHYSICS			
Materials	36		
Freight	40	76	
GEOCHEMISTRY			
Salaries	2,309		
Contractors	4,460		
Materials	430		
Travel	362		
Fuel	158		
Vehicles	308		
Communications	35		
Equipment cost	10	8,072	
ADMINISTRATION		1,464	
EXPENDITURE THIS QUARTER			11,227
PROJECT EXPENDITURE TO DATE			$ 12,794

APPENDIX A

ROGER CORNER BOREWATER SAMPLING PROGRAMME

****

ANALYTICAL RESULTS

COMLABS Pty. Ltd.
COMPUTERISED ANALYTICAL LABORATORIES

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ANALYTICAL REPORT

0023

JOB CON822585 O/N : 5182 AP

Results in ug/l

SAMPLE	Cu	Pb	Zn	Hg	U	F (mg/l)	TDS (g/l)
BC 1	70	<1	160	<0.5	7.2	2.1	8.50
BC 2	40	<1	130	<0.5	11.6	1.3	9.65
BC 3	360	<1	215	<0.5	6.8	1.7	10.6
BC 4	50	<1	230	<0.5	19.8	0.9	24.8
BC 5	25	<1	45	<0.5	1.2	0.9	7.05
BC 6	25	<1	35	<0.5	5.5	2.5	5.10
BC 7	25	<1	16	<0.5	7.9	2.7	4.15
BC 8	28	<1	65	<0.5	7.0	2.0	7.90
BC 9	10	<1	30	<0.5	1.4	1.0	3.00
BC 10	37	<1	60	<0.5	7.3	1.2	8.10
BC 11	15	<1	25	<0.5	10.4	1.5	2.45
BC 12	75	<1	45	<0.5	2.6	0.5	3.95
BC 13	17	<1	35	<0.5	7.3	1.8	6.35
BC 14	28	<1	70	<0.5	2.7	1.3	9.35
BC 15	30	<1	105	<0.5	12.2	2.6	10.4
BC 16	25	<1	50	<0.5	2.9	0.3	7.65
BC 17	30	<1	200	<0.5	3.4	0.9	4.90
BC 18	75	<1	320	<0.5	5.2	0.7	5.25
BC 19	40	<1	130	<0.5	5.1	1.0	4.65
BC 20	20	<1	28	<0.5	4.1	0.9	3.80
BC 21	55	<1	110	<0.5	11.7	1.3	10.0
BC 22	35	<1	50	<0.5	7.3	1.6	12.0
BC 23	20	<1	40	<0.5	5.4	1.0	4.65
BC 24	22	<1	35	<0.5	12.6	2.6	7.35
BC 25	17	<1	110	<0.5	2.6	1.1	1.85

.../ 2

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ANALYTICAL REPORT

0024

JOB COM822585 ; O/N : 5182 AD

Results in ug/l

SAMPLE	Cu	Pb	Zn	Hg	U	(ug/l) F	(g/l) TDS
RC 26	18	<1	55	<0.5	5.2	1.4	3.20
RC 27	25	<1	30	<0.5	3.4	0.8	3.45
RC 28	190	<1	220	<0.5	3.3	1.6	3.90
RC 29	33	<1	90	<0.5	6.1	0.7	6.10
RC 30	23	<1	33	<0.5	7.3	0.8	3.95
RC 31	15	<1	12	<0.5	5.1	1.2	1.60
RC 32	20	<1	75	<0.5	5.2	1.3	1.45
RC 33	14	<1	110	<0.5	7.4	1.3	1.80
RC 34	12	<1	28	<0.5	5.0	1.3	1.90
RC 35	30	<1	38	<0.5	6.5	1.6	7.35
RC 36	70	<1	40	<0.5	13.1	2.3	7.90
RC 37	35	<1	135	<0.5	0.5	<0.01	5.40
RC 38	23	<1	25	<0.5	6.6	1.3	6.05
RC 39	20	<1	1500	<0.5	4.8	1.2	6.50
RC 40	95	<1	110	<0.5	3.7	0.7	2.65
RC 41	45	<1	55	<0.5	6.1	1.3	1.60
RC 42	180	<1	80	<0.5	5.5	1.0	2.75
RC 43	15	<1	45	<0.5	1.3	1.1	1.25
RC 44	17	<1	33	<0.5	1.2	0.5	4.35
RC 45	15	<1	20	<0.5	31.8	0.7	2.50
RC 46	23	<1	40	<0.5	6.0	0.9	3.65
RC 47	35	<1	75	<0.5	1.1	0.5	1.95
RC 48	45	<1	65	<0.5	2.5	0.7	3.45
RC 49	15	<1	15	<0.5	3.9	1.4	1.95
RC 50	25	<1	33	<0.5	3.1	1.6	5.80

.../ 3

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ANALYTICAL REPORT

(0125)

JOB COM822585 O/N : 5182 AD

Results in ug/l

SAMPLE	Cu	Pb	Zn	Hg	U	(mg/l) F	(g/l) TDS
RC 51	100	<1	90	<0.5	12.8	2.4	4.30

Method of Analysis :

Cu Pb Zn	:	WAT3A
Hg	:	WAT4
U	:	RAD3
F	:	SIE3
TDS	:	WAT2

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ANALYTICAL REPORT

0026

JOB COM830058 O/N : 5192 AD

Results in ug/L

SAMPLE	Cu	Pb	Zn	Hg	F (ppm)	TDS (g/L)	U
RC 52	25	<1	170	<0.5	2.6	3.30	1.2
RC 53	15	<1	50	<0.5	1.1	1.70	1.2
RC 54	15	<1	25	<0.5	1.9	2.65	1.3
RC 55	15	<1	40	<0.5	1.4	4.00	2.0
RC 56	45	<1	55	<0.5	1.7	2.65	1.7
RC 57	30	<1	90	<0.5	1.4	7.00	7.4
RC 58	85	<1	90	<0.5	2.3	27.5	4.6
RC 59	25	<1	70	<0.5	0.9	7.15	2.0
RC 60	70	<1	340	<0.5	2.0	21.5	12.9
RC 61	35	<1	145	<0.5	1.2	8.50	2.5
RC 62	60	<1	100	<0.5	1.2	7.70	3.9
RC 63	65	<1	120	<0.5	2.2	7.90	4.2
RC 64	45	<1	80	<0.5	1.7	7.25	3.0
RC 65	20	<1	190	<0.5	2.2	4.10	3.1
RC 66	25	<1	190	<0.5	1.7	3.70	2.9
RC 67	20	<1	240	<0.5	1.5	3.15	1.0
RC 68	10	<1	20	<0.5	3.9	3.60	2.9
RC 69	20	<1	45	<0.5	0.8	4.95	1.1
RC 70	10	<1	30	<0.5	2.2	1.50	3.8
RC 71	15	<1	20	<0.5	0.6	1.50	1.1
RC 72	30	<1	55	<0.5	1.6	8.75	4.0
RC 73	35	<1	75	<0.5	1.4	6.90	2.6
RC 74	30	<1	100	<0.5	1.6	4.85	3.8

Method of Analysis :

Cu Pb Zn	:	WAT3A
Hg	:	WAT4
U	:	RAD3
F	:	SIE3

I

0027

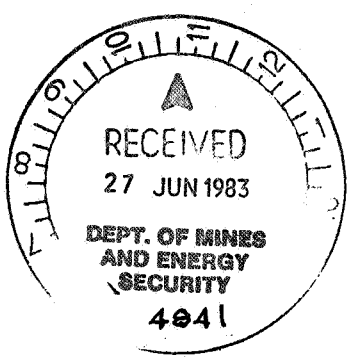
ABERFOYLE EXPLORATION PTY. LTD.

EXPLORATION LICENCE 1018

ROGER CORNER

Yorke Peninsula

Report for the Third Quarter
ending 28 April 1983



Adelaide
17 June 1983

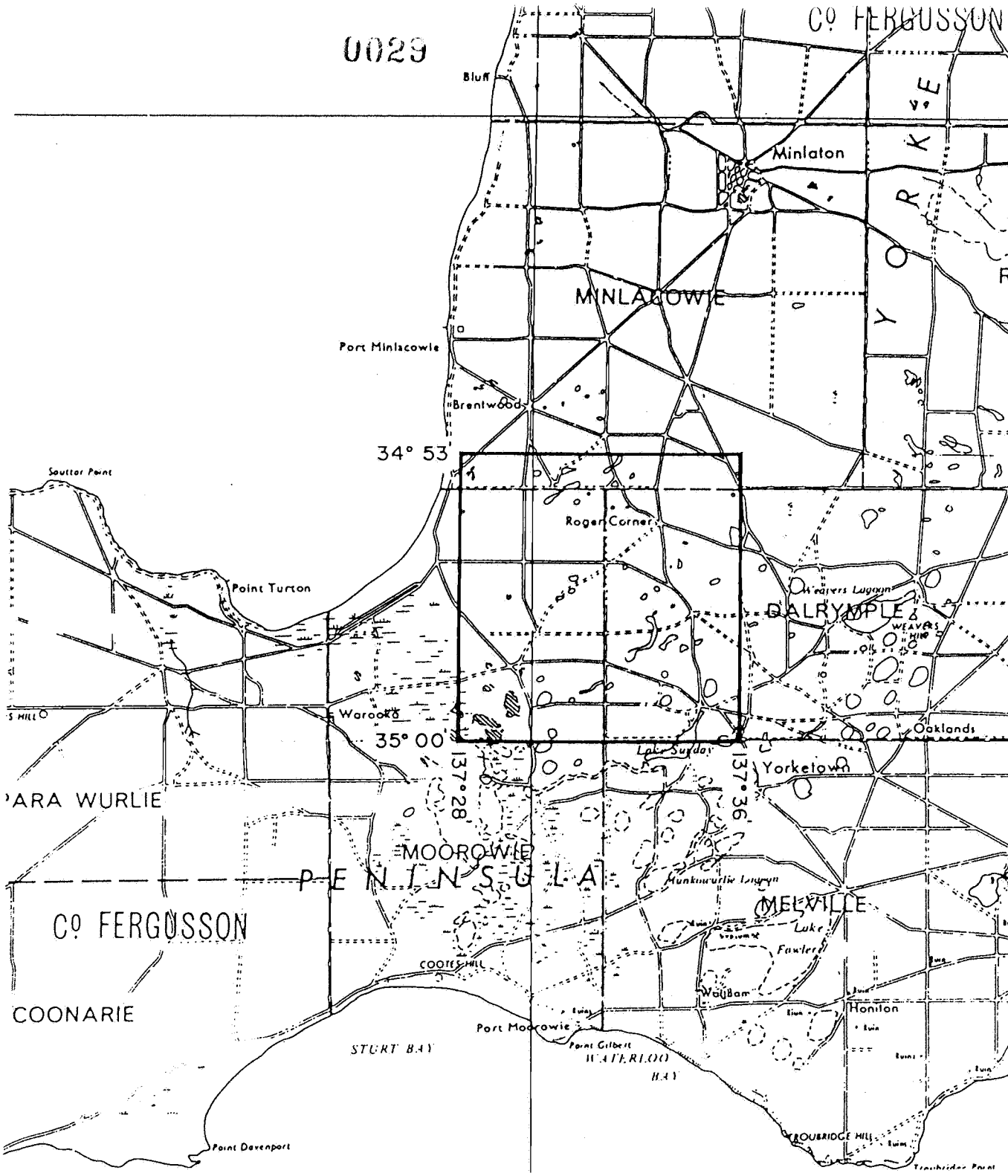
Report by: M.G. Teakle
Geologist
Aberfoyle Exploration Pty. Ltd.

0028

CONTENTS

FIGURES

0029



SCALE 1:250,000

KILOMETRES 5 0 5 10 15 20 25 KILOMETRES

APPLICANT: ABERFOYLE EXPLORATION PTY LTD

DM: 103/82 AREA: 158 square kilometres

1:250000 PLANS: MAITLAND

FIGURE 1

LOCALITY: ROGER CORNER AREA – Approx. 25 km N.W. of Edithburgh.

DATE GRANTED: DATE EXPIRED:

EL No:1018

1. INTRODUCTION

Exploration Licence 1018, Roger Corner, was secured by Aberfoyle to investigate an area on southern Yorke Peninsula (Figure 1) with anomalous trace heavy metal groundwater geochemistry near a discrete aeromagnetic anomaly.

It was considered that a hydrogeochemical anomaly in proximity to the aeromagnetic anomaly could provide encouragement for drill testing, geological parameters being favourable.

Work in the first two quarters consisted of reconnaissance and detailed hydrogeochemical surveys, as reported by Freytag (1982) and Teakle (1983).

This third quarterly report describes a reconnaissance ground magnetic survey over the Roger Corner aeromagnetic anomaly.

2. GROUND MAGNETICS SURVEY

Reconnaissance ground magnetics traverses (see Inset, Figs. 2 and 3) were carried out by technician C.R. Willmer in February, 1983. Initially, 32.6 line kilometres of ground magnetics were read at 50 metre stations on four traverse lines, designated

10,000E (T1)
10,000N (T2)
11,650N (T3)
8,400N (T4)

A Ballard proton precession magnetometer was used.

A follow-up survey of 21.0 line kilometres on three traverses, lines

8,300E (T5)
11,700E (T6)
13,400E (T7)

was subsequently read, also at 50 metre stations. An Austral PPM3 proton precession magnetometer was used.

Neither survey was corrected for diurnal variation.

Ground magnetic profiles are shown on Figures 2 and 3, and confirm the position on the ground and the general configuration of the airborne anomaly.

Modelling of the ground magnetic data suggests that the Roger Corner anomaly is due to two sources. The source of the prominent circular anomaly, at the centre of the licence, is interpreted to be at approximately 1500 metres below the surface. The smaller, satellite anomaly to the northeast is considered to have its source 300 to 500 metres below surface.

3. CONCLUSIONS AND FUTURE PROGRAMME

While the source of the main Roger Corner magnetic anomaly is too deep for reconnaissance investigations, the geology of the pre-Permian rocks above this source remains of interest. They are thought most likely to be Cambrian sediments above Lower Proterozoic metamorphic basement.

In order to determine the thickness of Permian present, a small refraction seismic survey will be carried out over the Roger Corner magnetic anomaly during the next quarter.

It is proposed that a test hole be drilled into the pre-Permian rocks above the source of the magnetic anomaly, providing that the cover of Permian sediments is not excessive.

4. REFERENCES

Freytag, I.B. (1982) E.L. 1018, Roger Corner: Report for the first quarter ending 28 October 1982. Aberfoyle Exploration unpub rept.

Teakle, M.G. (1983) E.L. 1018, Roger Corner: Report for the second quarter ending 28 January 1983. Aberfoyle Exploration unpub.rept.

Report by: M.G. Teakle

M.G. Teakle per
Geologist

Issued by:

I.B. Freytag
District Manager

Dist: Department of Mines (1)
Concept (1)
Hawthorn (1)
Adelaide (1)
MGT (1)

ABER EXPLORATION PTY. LTD.

SUMMARY OF EXPENDITURE

ROGER CORNER E.L. 1018

Expenditure 1st Quarter ended 28/10/82	$ 1,567
Expenditure 2nd Quarter ended 28/1/83	11,227
Expenditure 3rd Quarter (as attached)	2,504
Total Project costs to date	$15,298

Expenditure per Aberfoyle Accounts -

Year ended 17 November, 1982	$ 1,747
Year to 3 May, 1983 (P5/83) (as attached)	$13,551
Total Project costs to date	$15,298

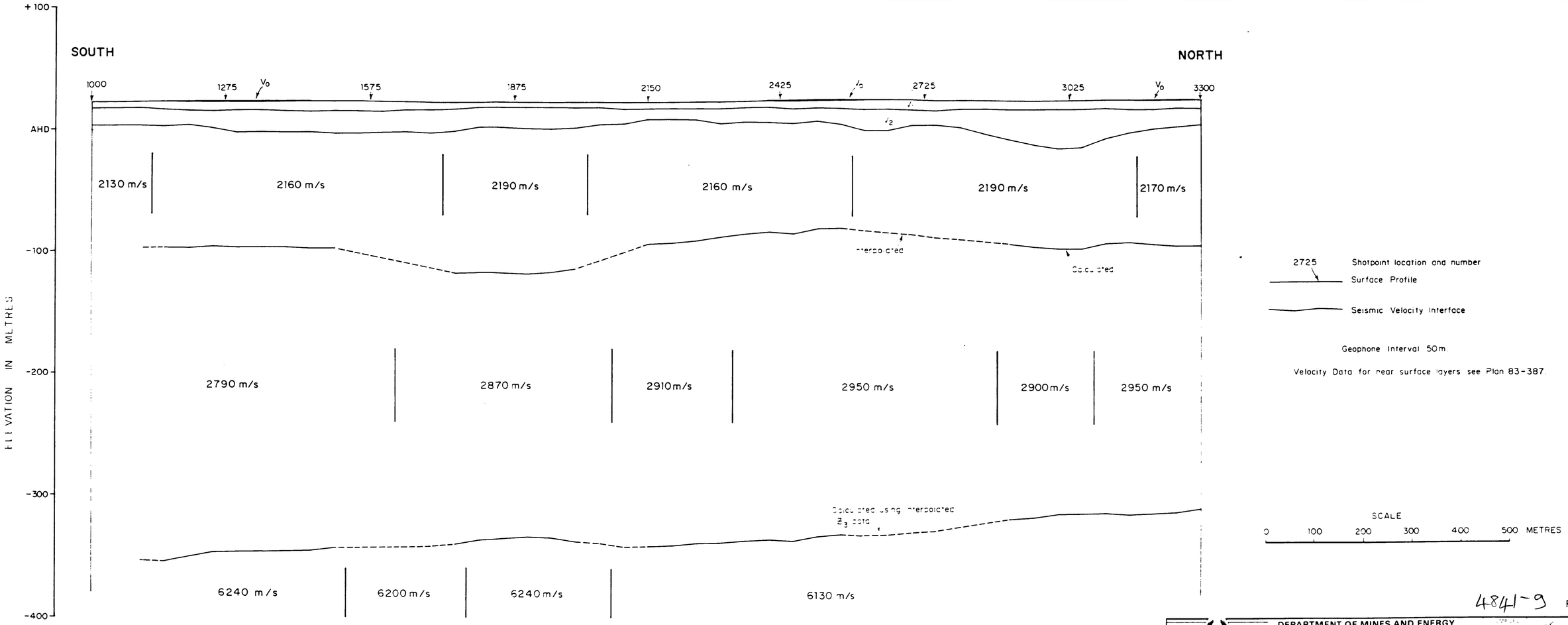
GLREP PERIOD: 5 CONSOLIDATED COST REPORT 14JUN83 11:10 PAGE 1
ABERFOYLE EXPLORATION PTY LTD - CAMBERWELL 56 ROGER CORNER EL 1018

ACCOUNT	BUDGET FOR YEAR	PAYMENTS 3RD QUARTER	PAYMENTS YTD	BALANCE OF BUDGET
ROGER CORNER EL 1018				
GEOLOGY				
... SALARIES	6030.00	123.00	1536.00	
... WAGES	400.00	103.00	148.00	
... TRAVELLING	500.00	13.50	13.50	
... FUEL	70.00	0.00	0.00	
... VEHICLE COSTS	300.00	0.00	0.00	
GEOLOGY	7300.00	239.50	1697.50	5602.50
SURVEY				
... SALARIES	500.00	0.00	0.00	
... WAGES	350.00	0.00	0.00	
... MATERIALS	150.00	263.00	263.00	
... TRAVELLING	400.00	0.00	0.00	
... FUEL	50.00	0.00	0.00	
... VEHICLE COSTS	150.00	56.00	56.00	
SURVEY	1600.00	319.00	319.00	1281.00
GEOPHYSICS				
... SALARIES	3540.00	1677.00	1677.00	
... WAGES	1100.00	297.00	297.00	
... MATERIALS	0.00	43.75	79.75	
... TRAVELLING	1820.00	286.44	286.44	
... FUEL	190.00	104.96	104.96	
... HIRING COSTS	500.00	144.00	144.00	
... FREIGHT	0.00	0.00	39.61	
... VEHICLE COSTS	450.00	0.00	0.00	
GEOPHYSICS	7600.00	2553.15	2628.76	4971.24
GEOCHEMISTRY				
... SALARIES	500.00	0.00	2309.00	
... CONTRACTORS	2240.00	(1009.00)	3451.50	
... MATERIALS	360.00	0.00	430.05	
... TRAVELLING	200.00	0.00	361.61	
... FUEL	50.00	0.00	157.82	
... COMMUNICATIONS	0.00	0.00	35.00	

ABERFOYLE EXPLORATION PTY LTD - CAMBERWELL 56 ROGER CORNER EL 1018

ACCOUNT	BUDGET FOR YEAR	PAYMENTS 3RD QUARTER	PAYMENTS YTD	BALANCE OF BUDGET
... VEHICLE COSTS	150.00	0.00	308.00	
... EQUIPMENT COSTS	0.00	0.00	10.00	
GEOCHEMISTRY	3500.00	(1009.00)	7062.98	(3562.98)
PERCUSSION DRILLING				
... SALARIES	1150.00	0.00	0.00	
... CONTRACTORS	11250.00	0.00	0.00	
... MATERIALS	50.00	0.00	0.00	
... TRAVELLING	360.00	0.00	0.00	
... FUEL	40.00	0.00	0.00	
... VEHICLE COSTS	150.00	0.00	0.00	
PERCUSSION DRILLING	13000.00	0.00	0.00	13000.00
ASSAYS				
... CONTRACTORS	300.00	0.00	0.00	
ASSAYS	300.00	0.00	0.00	300.00
TENURE				
... TENEMENT COSTS	300.00	0.00	0.00	
TENURE	300.00	0.00	0.00	300.00
OTHER SERVICES				
... SALARIES	500.00	0.00	0.00	
... COMMUNICATIONS	200.00	75.00	75.00	
OTHER SERVICES	700.00	75.00	75.00	625.00
... IRECT COSTS	34300.00	2177.65	11783.24	22516.76
INDIRECT COSTS				
... ADMINISTRATION	5200.00	326.63	1767.45	

ACCOUNT	BUDGET FOR YEAR	PAYMENTS 3RD QUARTER	PAYMENTS YTD	BALANCE OF BUDGET
INDIRECT COSTS	5200.00	326.63	1767.45	3432.55
ROGER CORNER EL 1018	39500.00	2504.28	13550.69	25949.31



4841-9 FIG.3

DEPARTMENT OF MINES AND ENERGY
SOUTH AUSTRALIA

C.D.C

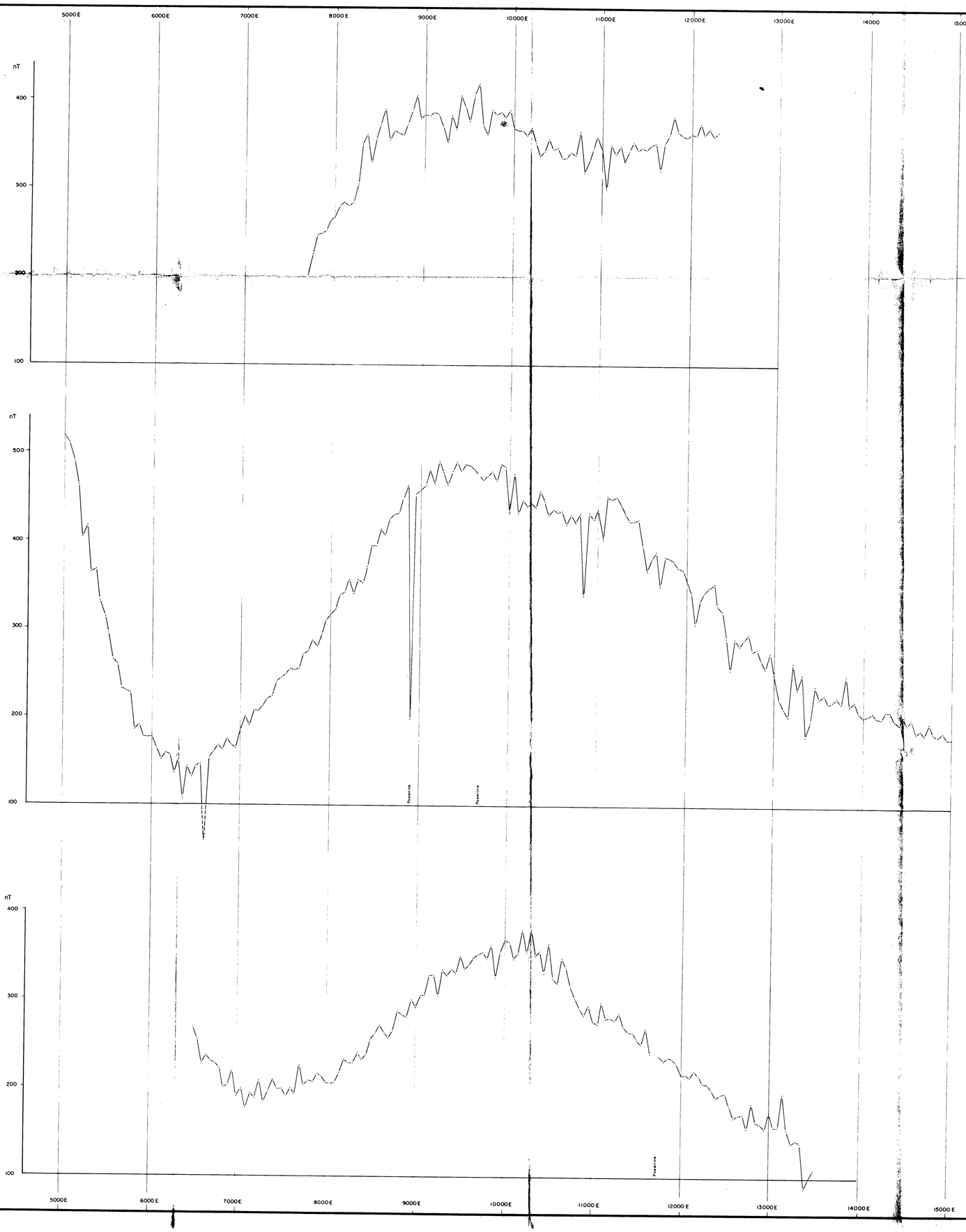
ROGER CORNER SEISMIC REFRACTION SURVEY
HD. DALRYMPLE
INTERPRETED SECTION

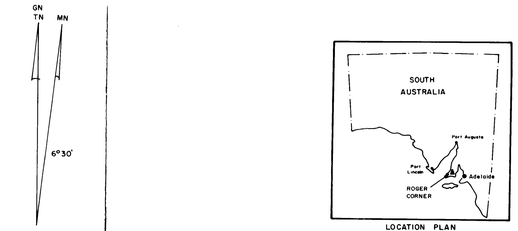
M.B

1:5000

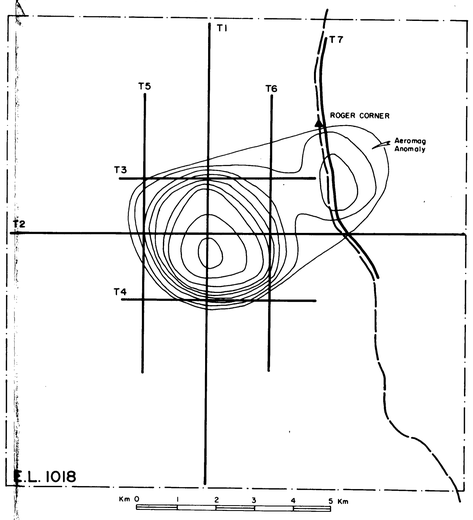
18-8-83

83-386





LOCATION PLAN



Readings at 50m stations using a
Ballard Proton Precession Magnetometer

Km 0 0·5 1·0 1·5 2·0 Km

FIGURE 2

4841-7

Aberfoyle Exploration Pty Ltd		
Geology:	SOUTH AUSTRALIA ROGER CORNER E.L. 1018 GROUND MAGNETIC PROFILES LINES T2, T3, T4	Location code: 153/12
Drawn: CRW		Date: APRIL 1983
Traced: JB		Scale: 1cm = 20nt 1: 20,000
Checked: MGT		Plans No RC 9 B
Revised by: Date:		

FIGURE 3

Aberfoyle Exploration Pty Ltd	
Geology:	SOUTH AUSTRALIA ROGER CORNER E.L. 1018
Drawn: CRW	GROUND MAGNETIC PROFILES LINES T1, T5, 6, 7
Traced: JB	Location code: I53/12
Checked: MGT	Date: APRIL 1983
Revised by: Date:	Scale: 1cm = 20nT 1:20,000
	Plate No RC 9A

Aberfoyle Exploration Pty Ltd

INCOREPORATED IN VICTORIA

144 Camberwell Road, Hawthorn East, Victoria 3123 Australia
Telephone: (03) 82 2226 Telex: AA38646

Adelaide Office:
1 Greenhill Road,
Wayville, S.A. 5034
(P.O. Box 84, Goodwood, 5034)
Phone: 272 8866

0037

EXPLORATION LICENCE 1018

ROGER CORNER

Progress Report for the Fourth Quarter

ending 27 July, 1983

The viability of conducting a small seismic survey over the Roger Corner magnetic anomaly was considered this quarter, to establish a guide to the thickness of Permian Sediments overlying either Cambrian or older Proterozoic basement. This was considered desirable before reaching a decision whether to test drill the basement rocks, and as to which drilling technique would be most practicable.

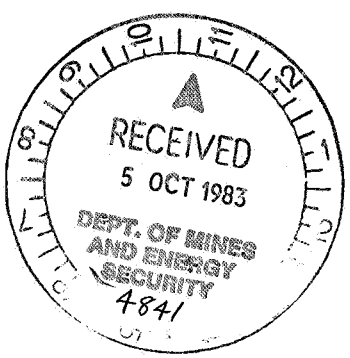
This seismic survey was carried out by the Geophysics Division, South Australian Department of Mines and Energy on 18-22nd July, 1983. Aberfoyle laid out the shot holes and supervised the shot hole drilling.

A full report on this seismic will be lodged next Quarter.

Expenditures on this project now stand at:-

Fourth Quarter.....$6,919.44
Project Total.....$22,217.00
(see details attached)

I.B.Freytag
District Manager



GLREP PERIOD: 8 CONSOLIDATED COST REPORT
ABERFOYLE EXPLORATION PTY LTD - CAMBERWELL 56 ROGER CORNER EL 1018

ACCOUNT	PAYMENTS 4TH QUARTER	PAYMENTS YTD
ROGER CORNER EL 1018		
GEOLOGY		
... SALARIES	840.00	2376.00
... WAGES	90.00	238.00
... TRAVELLING	0.00	13.50
... FUEL	74.00	74.00
... DISTRICT ACCOMMODATION	36.00	36.00
GEOLOGY	1040.00	2737.50
SURVEY		
... MATERIALS	0.00	263.00
... VEHICLE COSTS	0.00	56.00
SURVEY	0.00	319.00
GEOPHYSICS		
... SALARIES	995.00	2672.00
... WAGES	0.00	297.00
... CONTRACTORS	2573.00	2573.00
... MATERIALS	0.00	79.75
... TRAVELLING	311.09	597.53
... FUEL	284.22	389.18
... HIRING COSTS	0.00	144.00
... DISTRICT ACCOMMODATION	224.10	224.10
... FREIGHT	0.00	39.61
... VEHICLE COSTS	200.00	200.00
GEOPHYSICS	4587.41	7216.17
GEOCHEMISTRY		
... SALARIES	0.00	2309.00
... CONTRACTORS	0.00	3451.50
... MATERIALS	0.00	430.05
... TRAVELLING	0.00	361.61
... FUEL	0.00	157.82
... COMMUNICATIONS	0.00	35.00
... VEHICLE COSTS	0.00	308.00
... EQUIPMENT COSTS	0.00	10.00
GEOCHEMISTRY	0.00	7062.98
TENURE		
... TENEMENT COSTS	240.00	240.00
TENURE	240.00	240.00
OTHER SERVICES		
... COMMUNICATIONS	99.51	174.51
... VEHICLE COSTS	50.00	50.00
OTHER SERVICES	149.51	224.51
... IRECT COSTS	6016.92	17800.16
INDIRECT COSTS		
... ADMINISTRATION	902.52	2669.97
INDIRECT COSTS	902.52	2669.97
ROGER CORNER EL 1018	6919.44	20470.13

II

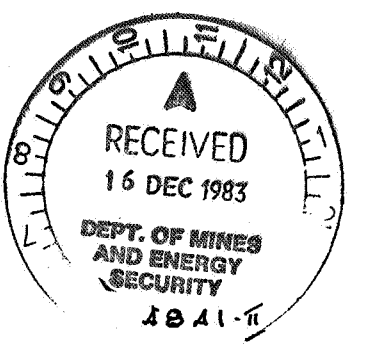
0039

ABERFOYLE EXPLORATION PTY. LTD.

Exploration Licence No.1018

ROGER CORNER

Progress Report for the 5th
Quarter ending 28 Oct, 1983



Adelaide
25 November 1983

Report by: M.G. Teakle
Geologist
Aberfoyle Exploration Pty. Ltd.

0040

A report on the seismic refraction survey over the Roger Corner magnetic anomaly by C.D. Cockshell was received from the Geophysics Division, South Australian Department of Mines and Energy, and is appended.

This report indicates that Archaean metamorphic or Cambrian carbonate basement beneath relatively flat-lying Quaternary Tertiary(?) and Permian sediments is at a depth of between 337 and 378 metres below surface over the survey area.

A stratigraphic drillhole to test exploration potential of the pre-Permian rocks associated with the Roger Corner magnetic anomaly is now being considered.

A statement of expenditure is appended.

Report by: M. G. Teakle

M.G. Teakle
Geologist

Issued by: I.B. Freytag

I.B. Freytag
District Manager

Dist: Dept.Mines (1)
Concept (1)
Hawthorn (1)
Adelaide (1)
MGT (1)

SUMMARY OF EXPENDITURE

ROGER CORNER E.L. 1018

Expenditure 1st Quarter ended 28/10/82	$ 1,567
Expenditure 2nd Quarter ended 28/ 1/83	11,227
Expenditure 3rd Quarter ended 28/ 4/83	2,504
Expenditure 4th Quarter ended 28/ 7/83	6,919
Expenditure 5th Quarter (as attached)	4,090
Total Project costs to 28/10/83	$26,307

Expenditure per Aberfoyle Exploration Pty Ltd accounts -

Period ended 17 November 1983	$ 1,747
Year to 28 October 1983 (P11/83) (as attached)	24,560
Project Costs to 28 October 1983	$26,307

Prepared:

Checked

ACCOUNT	PAYMENTS 5TH QUARTER	PAYMENTS YTD
ROGER CORNER EL 1018		
GEOLOGY		
... SALARIES	95.00	2471.00
... WAGES	0.00	238.00
... CONTRACTORS	37.50	37.50
... MATERIALS	359.73	359.73
... TRAVELLING	0.00	13.50
... FUEL	0.00	74.00
... DISTRICT ACCOMMODATION	15.00	51.00
GEOLOGY	507.23	3244.73
SURVEY		
... MATERIALS	0.00	263.00
... VEHICLE COSTS	0.00	56.00
SURVEY	0.00	319.00
GEOPHYSICS		
... SALARIES	0.00	2672.00
... WAGES	0.00	297.00
... CONTRACTORS	2673.00	5246.00
... MATERIALS	199.00	278.75
... TRAVELLING	62.45	659.98
... FUEL	22.20	411.38
... COMMUNICATIONS	30.00	30.00
... HIRING COSTS	0.00	144.00
... DISTRICT ACCOMMODATION	0.00	224.10
... FREIGHT	0.00	39.61
... VEHICLE COSTS	0.00	200.00
GEOPHYSICS	2986.65	10202.82
GEOCHEMISTRY		
... SALARIES	0.00	2309.00
... CONTRACTORS	0.00	3451.50
... MATERIALS	0.00	430.05
... TRAVELLING	0.00	361.61
... FUEL	0.00	157.82

ACCOUNT	PAYMENTS 5TH QUARTER	PAYMENTS YTD
... COMMUNICATIONS	0.00	35.00
... VEHICLE COSTS	0.00	308.00
... EQUIPMENT COSTS	0.00	10.00
GEOCHEMISTRY	0.00	7062.98
TENURE		
... TENEMENT COSTS	0.00	240.00
TENURE	0.00	240.00
OTHER SERVICES		
... COMMUNICATIONS	62.24	236.75
... VEHICLE COSTS	0.00	50.00
OTHER SERVICES	62.24	286.75
... IRECT COSTS	3556.12	21356.28
INDIRECT COSTS		
... ADMINISTRATION	533.40	3203.37
INDIRECT COSTS	533.40	3203.37
ROGER CORNER EL 1018	4089.52	24559.65

DEPARTMENT OF MINES AND ENERGY
SOUTH AUSTRALIA

0044

REPT. BK. NO. 83/75

ROGER CORNER SEISMIC REFRACTION SURVEY FOR ABERFOYLE EXPLORATION PTY. LTD.

GEOLOGICAL SURVEY

By

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15TH AUGUST, 1983

D.M.E. No. 55/82

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ROGER CORNER SEISMIC REFRACTION SURVEY FOR ABERFOYLE EXPLORATION PTY. LTD.

ABSTRACT

A seismic refraction survey at Roger Corner, near Yorketown on Lower Yorke Peninsula, has profiled pre-Permian bedrock and several other shallower refractors. The survey was carried out at the request of Aberfoyle Exploration Pty. Ltd., licencees of EL 1018.

A 2 300 m long north-south profile has indicated that a series of relatively flat-lying Quaternary, ?Tertiary and Permian units overly a 6130-6240 m/s bedrock refractor, 337 m deep in the north to 378 m in the south at an average dip of 1°. The velocity of this refractor is typical of Archaean metamorphic basement, although the possibility that it represents a high-speed Cambrian carbonate unit cannot be dismissed.

INTRODUCTION

Aberfoyle Exploration Pty. Ltd. hold Exploration Licence No. 1018 in the southern-central part of Yorke Peninsula in South Australia (Fig. 1). Interest in the Roger Corner area is based on the coincidence of a prominent circular aeromagnetic anomaly and heavy metal hydrogeochemical trace anomalies. Drilling of the geological environment had been planned but uncertainty about depth to Cambrian-Precambrian bedrock made it difficult to plan a drilling programme.

The Department of Mines and Energy were requested to perform a seismic refraction survey in the area, the primary aim of which was to define the base of Permian sediments. In conjunction with

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this survey, a short series of seismic reflection experiments were proposed, at departmental expense, to evaluate the possible application of the method in the area. This work was undertaken on 18-22nd July, 1983.

Previous seismic surveys in the general area include a series of refraction tests over the Lower Yorke Peninsula by Harris and Milton (1957), and the Yorketown - Pt. Vincent Seismic Survey by Geosurveys of Australia Pty. Ltd. for Beach Petroleum NL. (Yakunin, 1966).

METHODS USED

Refraction

An in-line reciprocal refraction technique was used to provide data for determining the depth of Permian sediments. Predrilled and PVC-cased 6 m deep shotholes were provided by the client at predetermined sites as shown in Figure 2. Two abutting geophone spreads were used, the northern spread extending from shotpoint (SP) 2150 to SP3300 and the southern spread extending from SP1000 to SP2150. An Input/Output DHR1632 recording unit was used to record the 24-channel data from single refraction geophones spaced 50 m apart.

For the northern spread, a central split-spread shot was recorded using SP2725 followed by reciprocal pairs of shotpoints with increasing offset viz: SPs 2425 & 3025, 2150 & 3300, 1575 & 3800 and 1000 & 4300. For the southern spread SP1575 was the centre shot and the reciprocal shotpoint pairs were SPs 1275 & 1875, 1000 & 2150, 500 & 2725 and 000 & 3300. Where the shotpoints for both spreads coincided, two separate shotholes were provided. All charges were water tamped except the shallower SP1000 charges.

The time taken for the first arrival of energy at each geophone from the instant of detonation for each shot was measured and recorded as the travel time. The weathering data on the near surface layers were used to calculate the vertical travel time from the centre of the charge to the surface for each shot. This time was added to the refraction travel times to

theoretically place the shot at the surface to enable the interpretation method described by Hawkins (1961) to be employed. The error involved in using this time rather than the time for the actual slant travel path is estimated to be significantly less than 1 millisecond.

The corrected refraction travel times for each geophone and each shot are included in Appendix I along with the shotpoint data and the applied shotpoint corrections.

Weathering Data

Determination of the velocities and thickness of the near surface low velocity "weathered" layers was done at each shotpoint using separate "weathering" refraction spreads. This method involved shooting small charges in hand dug shot holes, typically 0.2 - 0.4 m deep, in the centre of a 24-channel geophone spread having a geophone interval of 5 m.

The presence of a sub-outcropping hard calcrete had a detrimental effect on both depth of the shots and quality of the shallow refraction data. Interpretation of the data was based on standard critical distance and intercept time formula, similar to those contained in Dobrin (1960), but corrected for shot depth.

Reflection

The experimental seismic reflection work involved laying a 24-channel geophone spread centred on SP2150, using single reflection geophones at a 25 m interval except between geophones 12 & 13, where the geophones were placed 50 m apart. Shots were placed in the remnants of the shotholes used for the refraction survey with a centre shot at SP2150 and "walk - away" shots at SP's 1875, 1575 and 1275 to the south and SP's 2425, 2725 and 3025 to the north. In most holes charges were placed at depths greater than 5 m but hole deterioration at SP's 1275 and 3025 limited shot depth to 1-1.5 m.

No filters were used during the recording of the data except for the standard 500 hz high-cut filter.

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Surveying

All shotpoints and refraction geophone stations were optically levelled and horizontally located, and tied into the existing benchmark system in the area. These data are summarized in Appendix II.

RESULTS

Refraction

Data quality of the shallow weathering spreads is regarded as fair to good while the main refraction data quality is regarded as very good.

Interpreted thicknesses and velocities for each near-surface layer at each shotpoint derived from the weathering data are shown in Appendix I. At four shotpoints a discontinuous Layer 0, up to 1 m thick was interpreted, having a velocity ranging from 420 to 670 m/s. A thicker Layer 1 has been interpreted at all shotpoints with a thickness of 3.7 - 8.5 m and a velocity range of 560 - 1270 m/s. This layer appears to correlate well with the sub-outcropping nodular to bouldery caclrete while Layer 0 corresponds to thin lenses and pockets of soil developed on top of the calcrete. The underlying Layer 2 varies in velocity from 1650 to 1930 m/s.

Interpetation of the main refraction data produced values for the thickness of Layer 2 and two deeper layers beneath most geophone stations with their associated seismic velocities as well as the velocity for the "bedrock".

These data however are dependant on the interpolation between shotpoints of the velocities and thicknesses of the near surface layers beneath each geophone station.

The variable quality of the weathering data, with subsequent uncertainty in definition of some layers at some shotpoints, the considerable variation of near-surface layer attributes as previously mentioned by Harris and Milton, 1957, and the interpolation of these data from shotpoints to geophone stations

appear to be the main detrimental factors in the quality of the interpretation. In an attempt to remove the irregularities in depth to the deeper refractors caused by near surface inhomogeneity, the thicknesses of the deeper layers interpreted by the method of Hawkins, 1961, were slightly smoothed using a 1:2:1 weighted running mean operator. The maximum variation from actual to smoothed data is 6 m, or 3 milliseconds travel time which is similar to the variation in shot to surface travel times as shown in Appendix I.

The interpretation is shown as a depth section in Figure 3 with the values tabulated in Figure 4. The thickness of Layer 2 varies from 9 to 32 m. The base of this layer appears relatively flat except for a broad relative high, 8 m above AHD, between stations 2100 and 2550, and a sharper 14 m deep trough between stations 2900 and 3100.

Layer 3 varies in thickness from 83 to 120 m and has an overall very small southerly dip and a pronounced 24 m deep trough between stations 1650 and 2050. Velocity for this zone is remarkably uniform, varying less than 40 m/s from its mean value of 2170 m/s. The thickness of Layer 4 is in the 217-258 m range while its depth increases from 337 m in the north to 378 m at SP 1000 at an average dip of 1°. The velocity of this layer ranges from 2790 to 2950 m/s. The underlying and deepest refractor found in the survey has a velocity of 6130 - 6240 m/s.

These velocities compare very closely to those found by Harris and Milton (1957), Yakunin and Stackler (1965) during the Stansbury Seismic and Gravity Survey and by Yakunin et al (1970) using refraction probes during the Lake Fowler Seismic, Magnetic and Gravity Survey. Comparison of seismic velocities with those stratigraphically tied to drillholes in the above surveys is the only method available, at this stage, to correlate the deeper seismic layers found with relative geological units.

Very limited borehole data available in the area indicates that beneath the calcrete layer, (Layer 1), exists a zone of lithological units including clays, sands and pebbly sands whose compositional has considerable spatial variation. These

variations and changes in water saturation are reflected in the data by changes in the velocity in Layer 2. Stratigraphic correlation of this layer is difficult and either a Tertiary on Permian age is possible for these weathered sediments.

Layer 3 has a uniform velocity averaging 2170 m/s which is typical of fresh Tertiary sediments not only of Yorke Peninsula but throughout the St. Vincent Basin. However, the interpreted 80-120 m thickness of this layer is much greater than could be expected based on the available geological knowledge of the area (Crawford, 1965). It is also possible that this layer represents Permian sediments, either loose sands and silts or deeply weathered boulder clays.

The underlying Layer 4 has a velocity of 2790-2930 m/s which is very typical of Permian boulder clays. However, if a weathered bedrock zone exists, it may be incorporated in this zone or may form a blind zone of intermediate velocity with insufficient thickness to be detected by the seismic refraction method.

Yakunin (1966) summarised the known bedrock - seismic velocity correlated data and concluded that the previous surveys 'demonstrated clearly that the Cambrian limestones and associated redbeds and shales gave refraction velocities also typical of metamorphic bedrock' (viz. 5800 to 6100 m/s). This overlapping of velocity ranges makes stratigraphic correlation of the deepest refractor very difficult on velocity information alone. However, the velocities observed in this survey, 6130-6240 m/s, are slightly higher than those of the overlap range which indicate that the bedrock in this area is more likely to be metamorphic basement.

Reflection

The results of the experimental reflection tests are very poor, with only weak indications of a reflector at 0.300 seconds apparent on several monitor records. This reflector corresponds to the Permian-bedrock interface at a depth of approximately 360 m. The main reason for the poor quality of the reflection

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data appears to be that the shots were too shallow and possibly too large so that a large amount of energy went into near-surface horizontally travelling waves, which, for most offset shots, completely swamped the vertically travelling reflected waves.

CONCLUSIONS AND RECOMMENDATIONS

The seismic refraction work carried out during this survey has indicated the presence of five distinct velocity layers. At several shotpoints isolated lenses of a low velocity soil horizon up to 1 m thick are present. The underlying, sub-outcropping Layer 1 corresponds to a nodular to bouldery calcrete intersected in all shotholes. This layer has both wide velocity and thickness ranges, being 560-1270 m/s and 3.7 - 8.5 m respectively. Similar parameter variations are observed in the underlying layer with velocities of 1650 to 1930 m/s and thicknesses of 9 to 32 m. This layer correlates with weathered sands, clays and pebbly sands intersected in boreholes but the age of the sediments is difficult to determine, with an age range of Tertiary to Permian possible.

The underlying Layer 3 has a uniform velocity of 2170 m/s which is typical of Tertiary sediments but its 80-120 m thickness is much greater than might be expected for such sediments in this area. Other possible units which may correlate with this layer are loose Permian sands or deeply weathered Permian boulder clays. Beneath this layer is 217 - 258 m of rock with a velocity of 2790 - 2950 m/s which is very typical of Permian boulder clay.

The deepest refractor found has a velocity of 6130 - 6240 m/s which is typical of metamorphic basement, although the possible existence of a high-speed Cambrian carbonate unit cannot be ignored. The depth to this refractor increases from 337 m in the north to 378 m at SP 1000 at an average dip of 1°.

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It is recommended that any further seismic surveys in this area pay particular attention to the collection of accurate and detailed weathering data for more accurate interpretation of refraction and reflection data.

CDC:AF

C.D. COCKSHELL

ACKNOWLEDGEMENTS

I would like to acknolwedge the assistance given by Roger Willmer of Aberfoyle Exploration Pty. Ltd. both prior to and during the field work.

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APPENDIX I
Refraction and Shotpoint Data

SOUTHERN SPREAD (1000 - 2150) TRAVEL TIMES (CORRECTED TO SURFACE, msec)

GEOPHONE STATION	SP1575	SP1275	SP1000	SP500	SP000	SP1875	SP2150	SP2725	SP3300
2150	284	391	?472	544	629	151	*23	287	440
2100	260	370	?462	533	617	123	38	297	445
2050	238	354	?454	526	611	102	63	314	453
2000	215	336	445	517	603	76	87	331	461
1950	193	319	430	509	595	52	110	349	469
1900	169	302	412	502	587	25	134	367	477
1850	145	281	393	495	580	26	158	386	487
1800	122	258	377	486	571	54	179	403	495
1750	101	237	360	482	565	78	204	418	505
1700	77	215	342	472	557	101	227	426	513
1650	53	192	325	464	550	124	249	435	522
1600	25	169	306	456	542	146	270	443	529
1550	26	148	287	448	535	168	291	452	539
1500	53	125	264	437	527	189	308	458	545
1450	77	103	241	421	521	213	325	467	554
1400	101	79	217	403	513	236	343	475	563
1350	123	56	193	385	504	260	360	484	571
1300	147	26	172	368	497	282	378	493	580
1250	169	26	147	349	489	302	394	500	588
1200	185	55	127	335	482	?321	416	?516	-
1150	216	79	101	315	475	339	430	523	610
1100	238	102	77	293	466	355	437	530	616
1050	259	121	47	268	449	371	444	536	622
1000	286	148	*30	250	437	392	455	?547	634

N.B. * DENOTES GEOPHONE MOVED 25 m AWAY FROM SHOTPOINT

NORTHERN SPREAD (2150 - 3300) GEOPHONE STATION	TRAVEL TIMES (CORRECTED TO SURFACE, msec)									
	SP2725	SP3025	SP3300	SP3800	SP4300	SP2425	SP2150	SP1575	SP1000A	SP1000B
3300	276	148	*25	246	396	383	?440	535	-	?640
3250	260	124	41	263	406	366	432	527	-	?632
3200	241	100	67	280	414	348	424	519	-	?626
3150	219	77	91	297	423	331	415	513	-	?616
3100	198	52	114	313	432	314	407	504	?607	?609
3050	174	23	143	333	441	298	392	495	?599	602
3000	150	24	165	348	448	280	374	487	590	594
2950	126	52	188	365	458	262	356	480	585	585
2900	104	78	210	381	465	243	339	472	575	578
2850	79	102	231	393	475	219	322	464	568	572
2800	51	125	251	401	483	195	304	456	561	563
2750	27	147	268	410	493	171	288	?451	553	?556
2700	28	172	287	420	501	148	270	442	545	549
2650	57	197	306	?430	511	130	252	436	540	541
2600	83	219	323	?439	519	106	230	428	533	535
2550	104	240	340	444	528	81	206	419	523	526
2500	123	258	355	455	534	55	182	404	513	514
2450	146	275	372	463	544	28	159	387	506	507
2400	168	291	390	?471	549	26	134	368	496	499
2350	193	?310	406	?481	?562	54	111	352	489	494
2300	214	326	413	488	568	76	88	335	481	486
2250	237	344	420	495	575	101	63	318	473	480
2200	259	363	429	506	584	126	39	301	466	?470
2150	279	380	438	513	592	146	*23	284	461	?464

N.B. * DENOTES GEOPHONE MOVED 25 m AWAY FROM SHOTPOINT

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SHOTPOINT	SPREAD	WEATHERING DATA					SHOT DEPTH (m)	VERTICAL TRAVEL TIME : SHOT TO SURFACE (MS)
		Z_o m	V_o m/s	Z_1 m	V_1 m/s	V_2 m/s		
000	S	0.9	460	6.2	1220	1820	5.0	5.3
500	S			6.4	930	1650	5.1	5.5
1000	S			4.7	560	1690	0.9	1.6
1000	NA						3.9	7.0
1000	NB						1.3	2.3
1275	S	0.7	560	6.0	1060	1720	5.5	5.8
1575	S			8.5	1180	1770	5.7	4.8
1575	N						5.1	4.3
1875	S			3.7	640	1810	5.9	7.0
2150	S			5.2	1030	1700	5.7	5.3
2150	N						6.0	5.5
2425	N	0.8	420	4.7	750	1930	5.6	8.2
2725	S			7.3	880	1880	5.7	6.5
2725	N						6.0	6.8
3025	N			7.2	1050	1860	5.6	5.3
3300	S	0.8	670	6.1	1000	1800	4.9	5.3
3300	N						5.4	5.8
3800	N			5.6	1200	1670	4.1	3.4
4300	N			5.0	1270	1710	4.1	3.2

* N.B. S DENOTES SOUTHERN: - 1000 - 2150 SPREAD
N DENOTES NORTHERN: - 2150 - 3300 SPREAD

APPENDIX II
SURVEY DATA

LINE YT 83 002 JULY 83

STN 0
E 731196 N 6128641
H 0.00 G POSN-NIL SP-

STN 500
E 731208 N 6129141
H 1.65 G POSN-NIL SP-

STN 1000
E 731219 N 6129641
H 2.71 G POSN-24 SP-

STN 1050
E 731220 N 6129691
H 2.48 G POSN-23-

STN 1100
E 731221 N 6129740
H 2.47 G POSN-22-

STN 1150
E 731222 N 6129799
H 2.71 G POSN-21-

STN 1200
E 731224 N 6129840
H 2.96 G POSN-20-

STN 1250
E 731225 N 6129890
H 3.08 G POSN-19-

STN 1275
E 731225 N 6129915
H 2.78 G POSN-S.P-

STN 1300
E 731226 N 6129940
H 2.79 G POSN-18-

STN 1350
E 731227 N 6129990
H 3.05 G POSN-17-

STN 1400
E 731228 N 6130040
H 3.64 G POSN-16-

STN 1450
E 731229 N 6130090
H 3.41 G POSN-15-

STN 1500
E 731231 N 6130140
H 3.39 G POSN-14-

STN 1550
E 731232 N 6130190
H 3.66 G POSN-13-

STN 1575
E 731232 N 6130215
H 3.73 G POSN-NIL S.-

STN 1600
E 731233 N 6130240
H 3.36 G POSN-12-

STN 1650
E 731234 N 6130290
H 2.99 G POSN-11-

STN 1700
E 731235 N 6130340
H 2.88 G POSN-10-

STN 1750
E 731236 N 6130390
H 2.64 G POSN-09-

STN 1800
E 731237 N 6130440
H 2.76 G POSN-08-

STN 1850
E 731239 N 6130490
H 3.15 G POSN-07-

STN 1875
E 731239 N 6130515
H 3.27 G POSN-NIL SP-

STN 1900
E 731240 N 6130540
H 3.16 G POSN-06-

STN 1950
E 731241 N 6130590
H 3.02 G POSN-05-

STN 2000
E 731242 N 6130640
H 3.08 G POSN-04-

STN 2050
E 731243 N 6130690
H 3.20 G POSN-03-

STN 2100
E 731244 N 6130740
H 3.19 G POSN-02-

STN 2150
E 731246 N 6130790
H 3.42 G POSN-01 24 SP-

STN 2200
E 731247 N 6130840
H 3.65 G POSN-23-

STN 2250
E 731248 N 6130890
H 3.88 G POSN-22-

STN 2300
E 731249 N 6130940
H 4.26 G POSN-21-

STN 2350
E 731250 N 6130990
H 4.78 G POSN-20-

STN 2400
E 731251 N 6131040
H 4.93 G POSN-19-

STN 2425
E 731252 N 6131065
H 5.03 G POSN-NIL SP-

STN 2450
E 731252 N 6131090
H 5.35 G POSN-18-

STN 2500
E 731254 N 6131140
H 5.97 G POSN-17-

STN 2550
E 731255 N 6131190
H 6.47 G POSN-16-

STN 2600
E 731256 N 6131240
H 6.85 G POSN-15-

STN 2650
E 731257 N 6131290
H 6.80 G POSN-14-

STN 2700
E 731258 N 6131340
H 6.55 G POSN-13-

STN 2725
E 731259 N 6131365
H 6.46 G POSN-NIL SP-

STN 2750
E 731259 N 6131390
H 6.12 G POSN-12-

STN 2800
E 731260 N 6131440
H 5.88 G POSN-11-

0061

STN 2850
E 731262 N 6131490
H 5.83 G POSN*10*

STN 2900
E 731263 N 6131540
H 5.59 G POSN*09*

STN 2950
E 731264 N 6131590
H 5.59 G POSN*08*

STN 3000
E 731265 N 6131640
H 5.93 G POSN*07*

STN 3025
E 731266 N 6131665
H 5.92 G POSN*NIL SP*

STN 3050
E 731266 N 6131690
H 6.03 G POSN*06*

STN 3100
E 731267 N 6131740
H 6.65 G POSN*05*

STN 3150
E 731269 N 6131790
H 6.79 G POSN*04*

STN 3200
E 731270 N 6131840
H 7.19 G POSN*03*

STN 3250
E 731271 N 6131889
H 7.25 G POSN*02*

STN 3300
E 731272 N 6131939
H 7.14 G POSN*01 SP*

STN 3800
E 731283 N 6132439
H 5.52 G POSN*NIL SP*

STN 4300
E 731295 N 6132939
H 5.05 G POSN*NIL SP*

LAT, LONG of S.P's

0	34.5730	137.3155
500	34.5714	137.3155
1000	34.5657	137.3155
1275	34.5648	137.3155
1575	34.5639	137.3155
1875	34.5629	137.3155
2150	34.5620	137.3155
2425	34.5611	137.3155
2725	34.5601	137.3155
3025	34.5552	137.3155
3300	34.5543	137.3155
3800	34.5527	137.3155
4300	34.5518	137.3155

NOTE : TO OBTAIN HEIGHT OF POINTS ON A.H.D ADD 19·634

LEGEND

E : Easting on AMG Grid
N : Northing on AMG Grid
H : Relative Height above Station 000(m)
G POSN : Trace No. of Geophone Spread
SP : Shot Point

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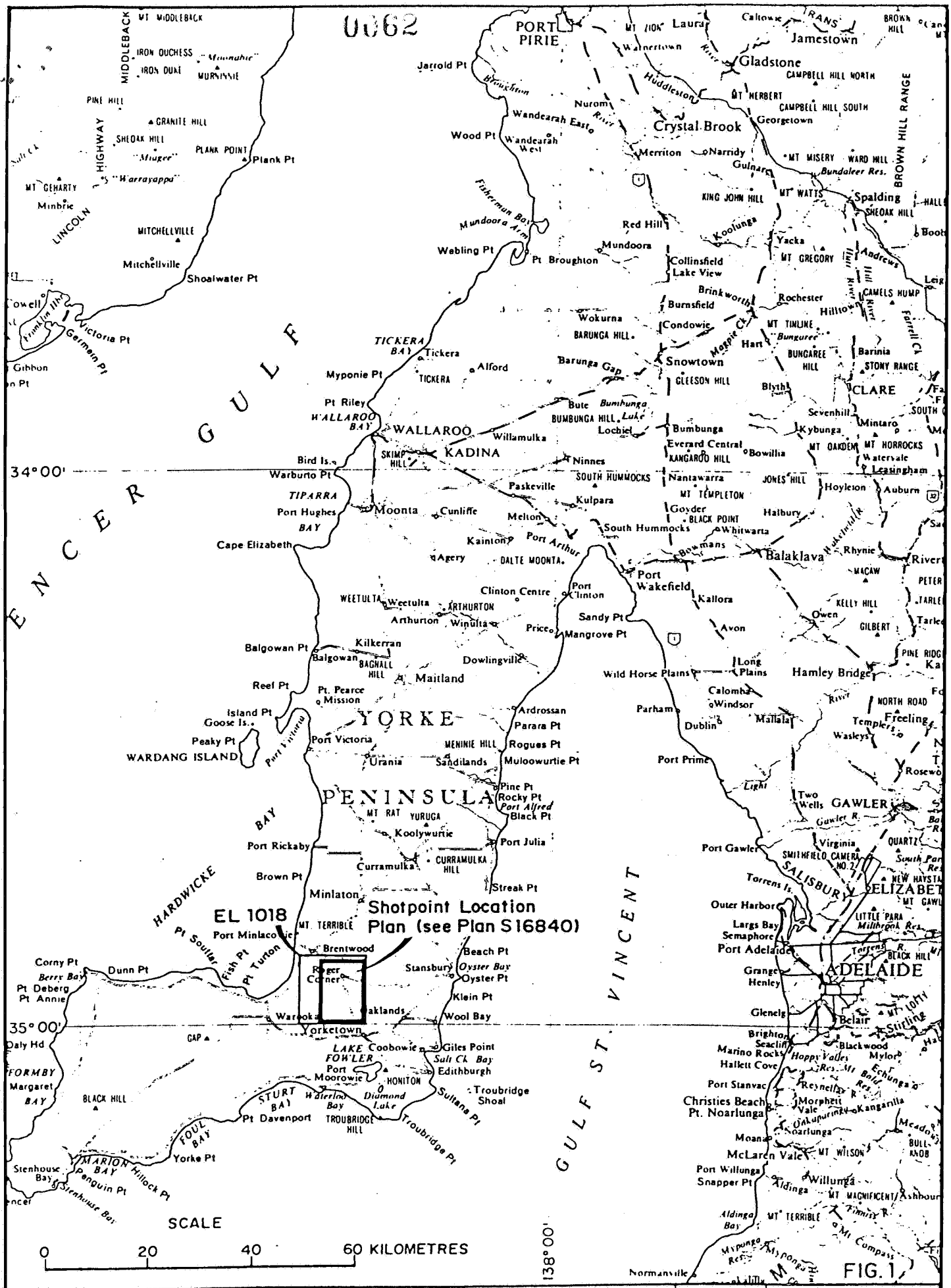


DEPARTMENT OF MINES AND ENERGY
SOUTH AUSTRALIA

COMPILED C.D.C.
CDO DATE
DRAWN M.B
SCALE 1 1000000
DATE 18-8-83
PLAN NUMBER S16839
CHECKED

ROGER CORNER SEISMIC REFRACTION SURVEY
HD. DALRYMPLE
LOCALITY PLAN

3275

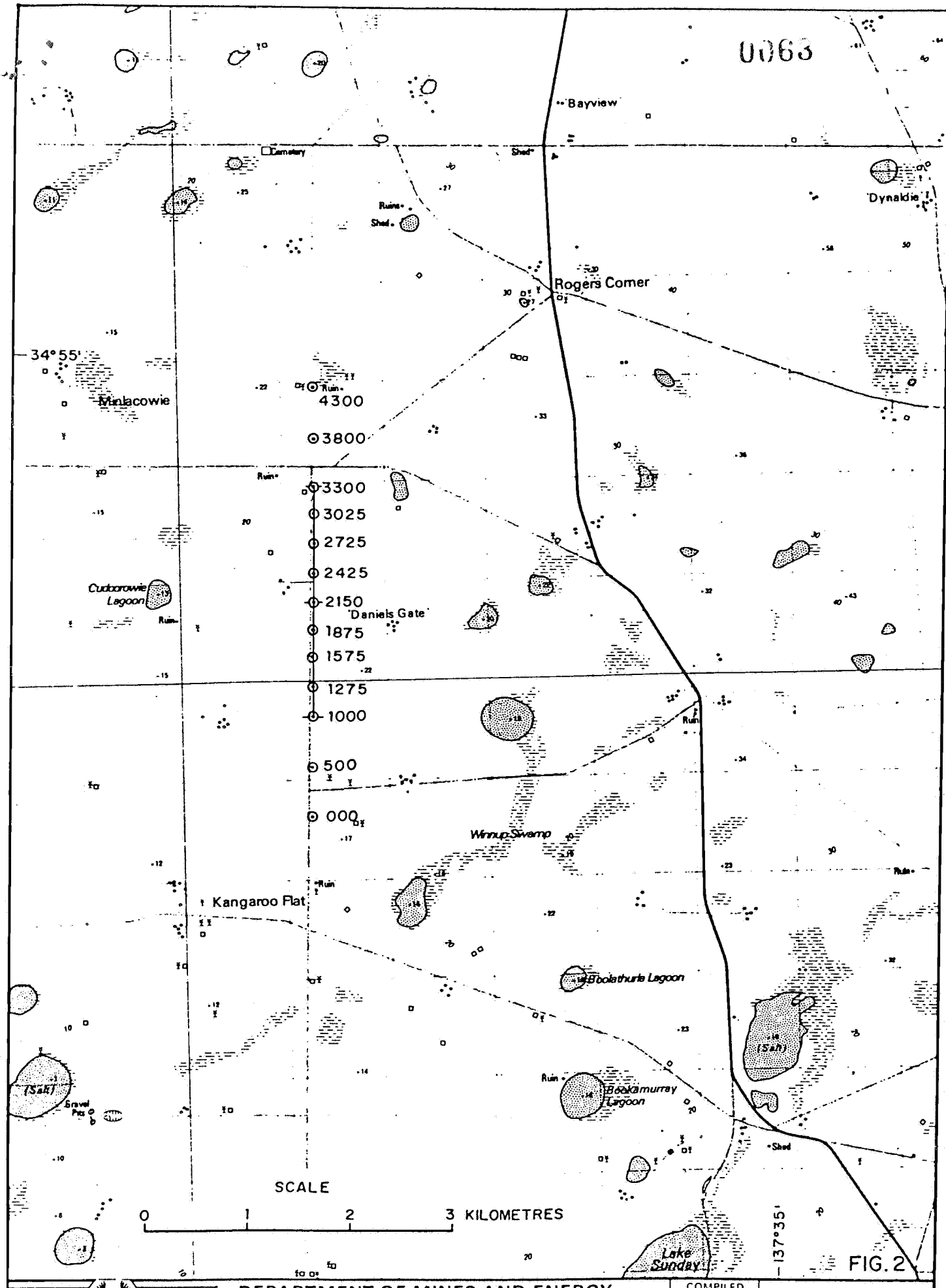


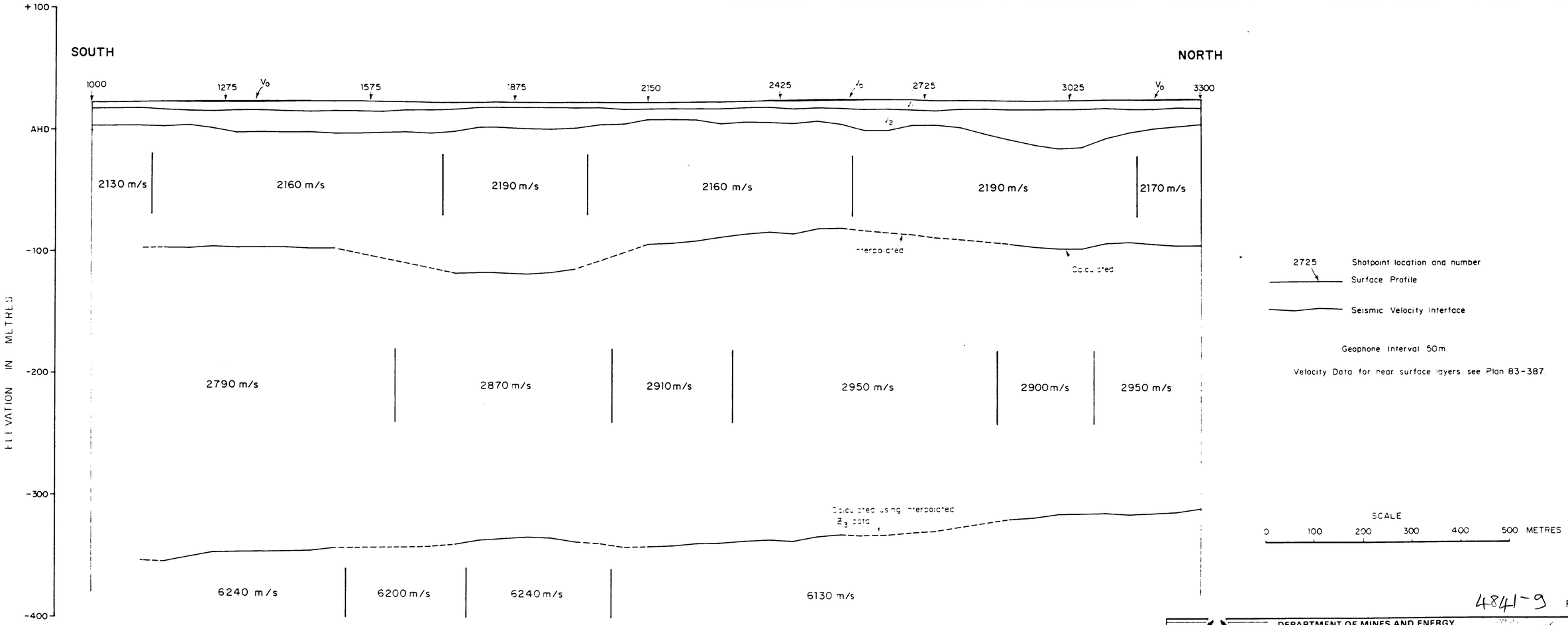
FIG. 2

DEPARTMENT OF MINES AND ENERGY
SOUTH AUSTRALIA

ROGER CORNER SEISMIC REFRACTION SURVEY
HD. DALRYMPLE
SHOTPOINT LOCATION PLAN

COMPILED C.D.C.	C.D.C. DATE
DRAWN M.B.	SCALE 1:50 000
DATE 23-8-83	PLAN NUMBER
CHECKED	S 16840

3205



4841-9 FIG.3

DEPARTMENT OF MINES AND ENERGY
SOUTH AUSTRALIA

C.D.C

ROGER CORNER SEISMIC REFRACTION SURVEY
HD. DALRYMPLE
INTERPRETED SECTION

M.B

1:5000

18-8-83

83-386

SHOTPOINTS	1000			1275					1575					1875					2150					2425					2725					3025					3300
GEOPHONE STATIONS	1000		1200			1400			1600				1800				2000		2200			2400			2600			2800				3000				3200		3300
Z_0 (=Do) (m)				0·3	0·8	1·1	0·8	0·6	0·5	0·5												0·3	0·5	0·6	0·8	1·0	1·1	1·2	0·6	0·1							0·5	0·7	0·9	1·0	0·8
V_0 (m/s)						560																				420												670		
Z_1 (m)	4·7	4·9	5·3	5·5	5·8	5·9	6·0	6·5	7·0	7·4	7·8	8·1	7·9	6·9	5·8	4·9	4·4	3·9	3·7	3·8	4·0	4·3	4·6	5·2	5·1	5·0	4·9	4·8	4·6	4·8	5·3	5·9	6·5	7·0	7·5	7·5	7·0	6·9	6·7	6·9	7·1	7·3	6·9	6·8	6·6	6·4	6·1
D_1 (m)	5	5	5	6	7	7	7	7	8	8	8	8	8	7	6	5	4	4	4	4	4	4	5	5	5	5	5	5	5	6	6	7	8	8	8	8	7	7	7	7	7	7	7	8	8	7	7
V_1 (m/s)	560					1060						1180						640						1030					750					880					1050						1000
Z_2 (m)			13·4	16·5	8·3	13·9	20·4	16·6	17·4	17·7	17·9	18·7	17·2	16·2	19·1	19·9	14·3	16·3	17·0	18·2	16·6	15·0	10·4		8·1	11·0	11·8	13·7	9·8	13·9	9·7	12·5	16·3	20·8	10·7	8·6	15·0	19·6	24·7	30·3	31·9	34·1	23·6	19·1	14·8		
Z_2 (with 1:2:1 weighted running mean applied) (m)	(14)	(14)	14·2	13·7	11·8	14·1	17·9	17·7	17·3	17·7	18·1	18·1	17·4	17·2	18·6	18·3	16·2	16·0	17·2	17·5	16·6	14·3	11·5	(9)	8·9	10·5	12·1	12·3	11·8	11·8	11·4	12·7	16·5	17·1	12·7	10·7	14·6	19·8	24·9	29·3	32·1	31·0	25·1	19·2	15·9	(14·5)	(14)
D_2 (averaged) (m)	(19)	(19)	19	20	19	21	25	25	25	26	26	26	25	24	25	23	20	20	21	22	21	18	17	(14)	14	16	17	17	17	18	17	20	25	25	21	19	22	27	32	36	39	38	32	27	24	22	21
V_2 (m/s)	1690					1720						1770						1810						1700					1930					1880					1860						1800
Z_3 (m)				98	107	93	97	94	96	95	95					115	120	120	120	119	115			103	103	98	91	94	88	93	90	84								88	83	80	87	83	91	95	98	99
Z_3 (with 1:2:1 weighted running mean applied) (m)		(101)	100	101	98	95	95	95	95	95	(99)	(104)	(108)	(111)	117	119	120	120	118	116	(112)	(107)	103	102	98	94	92	91	91	89	86	(83)	85)	(90)	(94)	(92)	(89)	86	84	83	84	86	90	95	98	99	
D_3 (averaged) (m)		(120)	120	120	119	120	120	120	121	121	(125)	(129)	(132)	(136)	140	139	140	141	140	137	(130)	(124)	117	116	114	111	109	108	109	106	106	(108)	(110)	(111)	(113)	(114)	(116)	118	120	122	122	118	117	119	120	120	
V_3 (m/s)	2130					2170						2160						2190						2160					2160					2190					2190						2170
Z_4 (m)			255	262		251	251	248	251	249	246	243	236	233	229	223	218	220	214	217	223	231	241	253	248	248	251	256	249	256	252	252	252	249	245	243	236	232	226	225	214	218	223	225	222	219	216
Z_4 (with 1:2:1 weighted running mean applied) (m)			257	258		251	250	250	250	249	246	242	237	233	229	223	220	218	216	218	224	232	242	249	249	249	252	253	253	253	253	252	251	249	246	242	237	232	227	223	218	218	222	224	222	219	217
D_4 (averaged) (m)			(377)	378		370	370	370	370	370	367	(367)	(366)	(365)	(365)	363	359	358	357	358	361	(362)	(366)	366	365	363	363	362	361	362	359	358	(359)	(359)	(357)	(355)	(351)	(348)	345	343	340	340	340	341	341	339	337	
V_4 (m/s)						2790												2870						2910					2950										2900						2950
V_5 (m/s)						6240						6200						6240																6130											

SURFACE

LAYER 0	Thickness Z_0	Depth to Base D_0	Velocity V_0	┐
LAYER 1	Thickness Z_1	Depth to Base D_1	Velocity V_1	├ Interpreted from Weathering Data
LAYER 2	Thickness Z_2	Depth to Base D_2	Velocity V_2	┘
LAYER 3	Thickness Z_3	Depth to Base D_3	Velocity V_3	┐
LAYER 4	Thickness Z_4	Depth to Base D_4	Velocity V_4	├ Interpreted from Main Refraction Data
LAYER 5			Velocity V_5	┘

D_4 251 Calculated Value

D_4 (365) Partially Interpolated Value

4841-10

FIG. 4

DEPARTMENT OF MINES AND ENERGY
SOUTH AUSTRALIA

ROGER CORNER SEISMIC REFRACTION SURVEY
HD. DALRYMPLE
INTERPRETED DATA VALUES

DRAWN C.D.C
CHECKED M.B
DATE 19-8-83
DRAWING NUMBER 83-387

II

0064

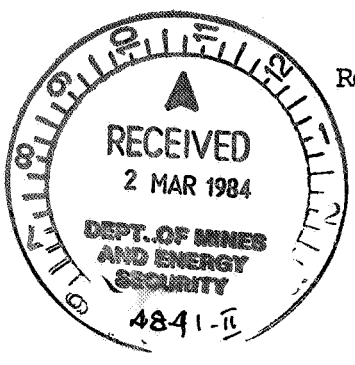
ABERFOYLE EXPLORATION PTY. LTD.

Exploration Licence No.1018

ROGER CORNER

Sixth and Final Report for
the Quarter ending 28.1.84

Adelaide
15 February 1984



Report by: Mark G. Teakle
Geologist
Aberfoyle Exploration

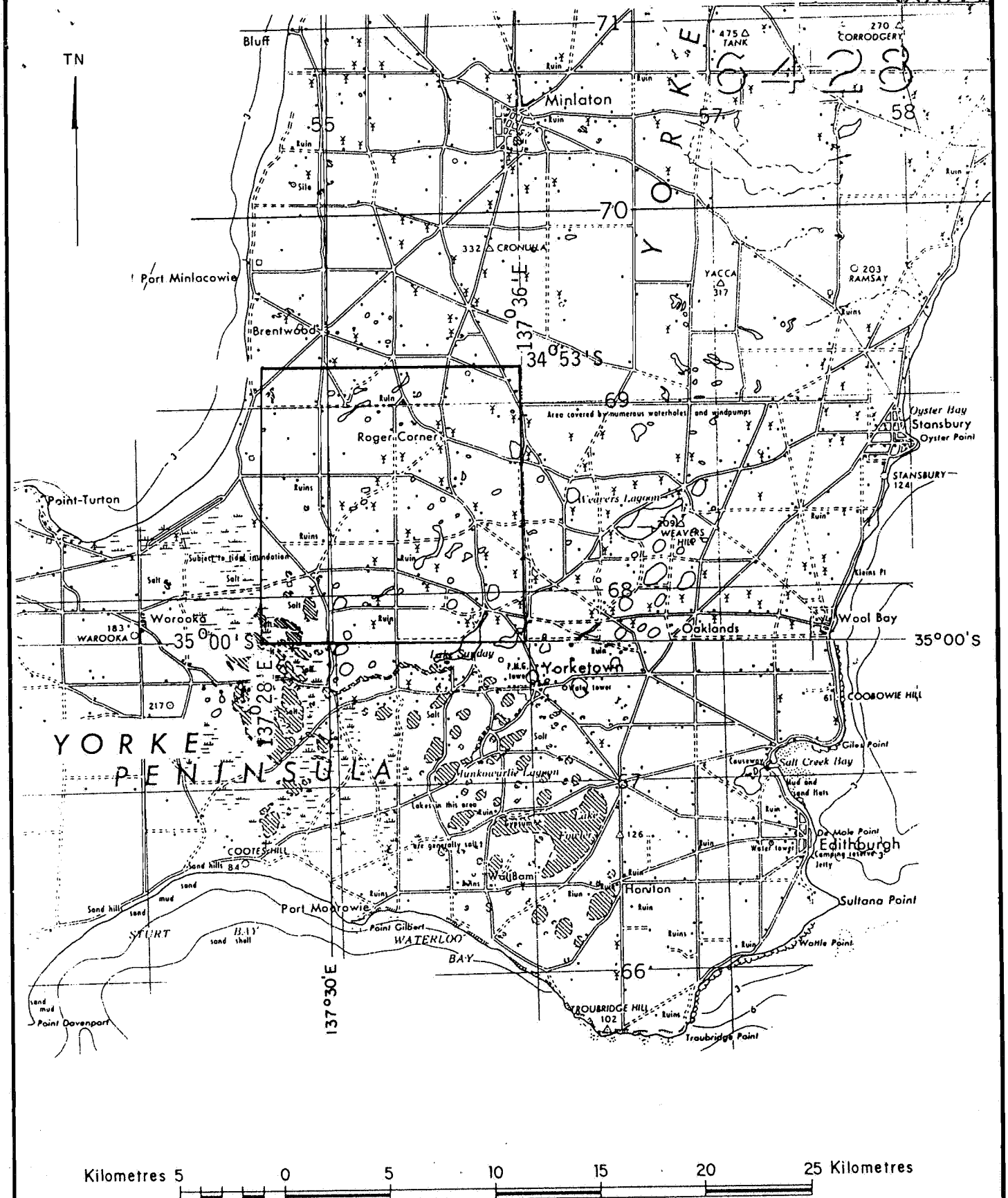
KEYWORDS

Magnetic Anomaly		Waterbore Geochemistry	
Ground Magnetics		Copper	Uranium
Lead	Zinc	Fluorine	Mercury
T.D.S.		Seismic Survey	

MAP SHEET

SI 53/12 MAITLAND

CONTENTS



Aberfoyle Exploration Pty Ltd

Drawn:	SOUTH AUSTRALIA	Location code: I 53/ 12
Traced: JB	ROGER CORNER – E.L. 1018	Date: November 1983
Checked:	LOCATION PLAN	Scale: 1: 250,000
Revised by: Date:		Plate No RC 10

INTRODUCTION

A statewide groundwater sampling programme conducted by the South Australian Department of Mines and Energy in 1979-80 reported that southern Yorke Peninsula is one of several areas in South Australia having significant groundwater heavy metal anomalies (Morris, 1982).

In particular, Observation Well DAL2 at Roger Corner registered anomalous Cu (4,350 ppb), Ag (4 ppb) and Ba (250 ppb). This well is situated adjacent to a discrete aeromagnetic anomaly, defined on the SADME MAITLAND 1:250,000 aeromagnetic sheet.

These combined factors provided the basis for an exploration concept and encouragement for further investigation of the area. A Moonta -style Cu(-Mo-Au) environment was considered a possible target.

TENEMENT DETAILS

Exploration Licence 1018 was granted to Aberfoyle on 28 July 1982 for a period of twelve months. The licence was subsequently extended for a further six months and was relinquished on 28 January 1984.

The licence area covered 158 square kilometres of cereal farming land underlain largely by surficial Quaternary deposits, a few Tertiary remnants, and poorly consolidated Permian sediments. There is no hard rock exposure.

EXPLORATION IN E.L. 1018

Initially, a limited reconnaissance hydrogeochemical survey of borewaters was carried out to determine whether anomalous trace metal values recorded in well DAL2 were more widespread in the licence area.

With some positive results in this reconnaissance programme, reported by Freytag (1982), a more extensive borewater sampling programme was carried out with the aim of defining an anomaly which might relate to buried mineralization. Seventy three bores and wells were sampled and the water analyzed for Cu, Pb, Zn, Hg, F, U and T.D.S.

The results of this survey (see Teakle, 1983a) failed to verify the order and diversity of metal anomalies recorded in the reconnaissance survey, although low order Cu, Zn, U and F anomalies and a salinity high over the western side of the aeromagnetic anomaly were defined.

It was considered that detailing of the Roger Corner magnetic anomaly was still warranted, and ground magnetometer traverses were undertaken to confirm the position on the ground and the general configuration of the airborne anomaly.

Modelling of the ground magnetic data indicated a depth to source of the Roger Corner anomaly of about 1 kilometre (see Teakle, 1983b).

In order to assess the viability of an exploratory drillhole to test the pre-Permian basement, the Geophysics Division, South Australian

Department of Mines and Energy, was engaged to run a small seismic refraction survey over the anomaly.

The report on this seismic survey, by C.D. Cockshell (see Teakle, 1983c) indicated that possible 'Archaean' metamorphic or Cambrian carbonate basement beneath Permian and younger cover is at a depth below surface of between 337 metres at the north and 378 metres at the south end of the traverse.

GENERAL CONCLUSIONS

Although the interpreted source of the Roger Corner magnetic anomaly is too deep for investigation, it was considered that the geological environment of the anomaly might offer exploration potential.

To test a pre-Permian blind target on the Roger Corner magnetic anomaly would require a deep drillhole, nominally 350 metres through Permian cover, and with adequate provision for sampling of pre-Permian basement.

No firm conclusions are drawn about the validity of trace heavy metal and salinity anomalies which were defined or their relation to potential underlying mineralisation.

It was deduced from seismic velocity data that either carbonate or metamorphic rocks underlie the Permian in the area of interest. In the former case, the rocks are most likely to be Cambrian in age, and in the latter, probably Lincoln Complex gneisses which offer limited exploration potential.

In view of the equivocal hydrogeochemical results, particularly with respect to thick Permian cover, the exploration concept was thus down-graded and the idea of drill-testing was abandoned.

REFERENCES

Freytag, I.B. (1982) E.L. 1018, Roger Corner, Report for the 1st Quarter ending 28 October 1982. Aberfoyle Expl. unpub. rept.

Morris, B.J. (1982) A Hydrogeochemical Study of Groundwater in South Australia and its application to Mineral Exploration. SADME Rept. 82/12 (unpub.)

Teakle, M.G. (1983a) E.L. 1018, Roger Corner, Report for 2nd Quarter ending 28 January 1982. Aberfoyle Expl. unpub. rept.

_____ (1983b) E.L. 1018, Roger Corner, Report for 3rd Quarter ending 28 April 1983. Aberfoyle Expl. unpub. rept.

_____ (1983c) E.L. 1018, Roger Corner, Report for 5th Quarter ending 28 October 1983 Aberfoyle Expl. unpub. rept.

Report by: M.G. Teakle

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Geologist

Issued by:

I.B. Freytag
District Manager

Dist: Dept Mines and Energy (1)
Concept (1)
Hawthorn (1)
Adelaide (1)
MGT (1)

ABERFOYLE EXPLORATION PTY LTD

SUMMARY OF EXPENDITURE

ROGER CORNER EL 1018

Expenditure 1st Quarter ended 28/10/82		$ 1,567
Expenditure 2nd Quarter ended 28/1/83		11,227
Expenditure 3rd Quarter ended 28/4/83		2,504
Expenditure 4th Quarter ended 28/7/83		6,919
Expenditure 5th Quarter ended 28/10/83		4,090
Expenditure 6th Quarter ended 28/1/84 -		
GEOLOGY		
Salaries	571	
Materials	38	
GEOPHYSICS		
Salaries	368	
INDIRECT COSTS		
Administration	147	1,124
Total project expenditure to 28/1/84		$ 27,431

Prepared:

Checked: