CONTENTS ENVELOPE 3914

TENEMENT: E.L. 634 - Finniss Springs - West of Marree.

TENEMENT HOLDER: Central Coast Exploration N.L.

03

[redacted]

CENTRAL COAST EXPLORATION N.L.

PROGRESS REPORT TO 27/8/80

FOR EL 634, SOUTH AUSTRALIA.

CONTENTS.

[redacted]

SUMMARY.

Central Coast Exploration N.L. was granted an Exploration Licence numbered 634 for one year from the 27th May, 1980.

Work during the quarter from the 27th May to the 27th August, 1980, has consisted of an aerial reconnaissance survey with sampling from the areas which appeared promising.

The samples taken were then assayed. The results are described in more detail later in this report with the full assay results shown in Appendix 3. Detailed petrographic descriptions of some of the samples have also been carried out.

The work done to date has been meant as a preliminary examination of the area so that recommendations for future exploration could be made.

LOCATION AND ACCESS.

The area lies between 29°33'S and 30°S and 137°17'E and 137°44'E and covers 1694 km^2. (See Mapl)

The climate is semi-arid and consequently there is little vegetation, mainly low scrub. The topography is predominantly flat with only a few hills.

Access throughout the area is mainly by station tracks. The Port Augusta - Alice Springs railway track passes though the northern section of the area. Marree is the closest township, approximately 55km east of the area covered by the licence.

HISTORY OF MINING IN THE AREA.

Previous work on the lease area has been limited. The Clara St Dora Mine is on the licence and at the turn of the century , a small scale mine was in operation. The copper ore here occurred in hard limestone in bunches, small veins and vughs and in soft calcareous rocks. According to Brown (1908), the ore originally raised was of a high grade and there was a large amount of low grade ore at the surface.

There is, however, no record of production figures from the mine.

REGIONAL GEOLOGY.

Most of the lease is covered by Cretaceous rocks, predominantly from the Marree Subgroup. These are marine shales, minor siltstones and sandstones.

About one quarter of the area is covered by Proterzoic rocks which are part of the Adelaide Geolsyncline Sequence. The strata represented are from the Burra Group and Sturt Tillite Group. The strata have been strongly folded and contorted and some of the deformation has resulted in the formation of breccia.

The rocks in the Burra Group are mainly quartzite, dolomite and siltstone.

Some outcrops of Sturt Tillite do occur, however, out crop in most areas is poor.

[redacted]

WORK CARRIED OUT BETWEEN 27/5/80 AND 27/8/80

As mentioned previously, the work carried out during this period was primarily done so that future exploration work could be planned.

There were two main types of work carried out;-

(i) Surface Rock Sampling.

(ii) Aerial Reconaissance.

Surface Rock Sampling.

Sampling concentrated on the Hermit Hill, Clara St Dora Mine area, Finnis Springs and Venable Springs. Some of these samples were selected for petrographic examination which was carried out by AMDEL.

Nearly all of the rocks sampled showed evidence of metaporphism, metasomatism, or both. Evidence shows that most of the rocks are altered. In one sample it appears that alteration occurred after metamorphism. There are no textural features to show if it was originally tuff or sediment in one sample. From the samples taken, recrystallisation of quartz has taken place but not in the feldspar and the heavier minerals. (F2M, F15M, F20M)

Dolomitisation of fine grained sediments has taken place to form a dolomitised shale(F3M) and a dolomitised sandstone(F4M). The full petrographic descriptions are shown in Appendix 3.

Some of the samples showed better assay results. These are listed and described below. The rest of the results are listed in Appendix 2. The assays were done by AMDEL using the Atomic Absorption method.

Sample.	Description and Assay Results.
F1	The sample is massive gossanous goethite. There is one trace of copper visible and some yellow oxides. It looks like the top of a weathered area or part of a shallowly dipping pyrite lens in ?calcareous sandstone. Cu 450ppm Pb 30ppm Zn 30ppm Ag 1ppm Mo 1ppm Au 0.02ppm U 5.5ppm
F2	The sample is a sideritic, brecciated rock with minor quartz. Cu 12ppm Pb 10ppm Zn 4ppm Ag <1ppm Mo 1ppm Au 5.5ppm

....7/...

F10 A sample from a gossanous outcrop. It is probably a false gossan derived from the weathering of siderite.

Cu 12ppm Pb 10ppm Zn 240ppm
Ag <1ppm Mo 1ppm Au<0.05ppm
U 1.9ppm

F11 This sample is a gossanous ?calcareous rock with a trace of grey ?cerrusite.

Cu 16ppm Pb 5ppm Zn 110ppm
Ag <1ppm Mo 1ppm Au<0.05ppm
U 1.5ppm

F12 A sample of gossanous quartz.

Cu 230ppm Pb 5ppm Zn 30ppm
Ag < 1ppm Mo 11ppm Au0.05ppm
U 3.7ppm

F14 This sample is a rough rock chip over 20m of gossanous and lesser gossanous quartz.

Cu 36ppm Pb 15ppm Zn 450ppm
Ag <1ppm Mo 2ppm Au <0.05ppm
U 4.5ppm

.....8/...

[redacted]

F15 A grab sample from a 8" hole in weathered shale.

Readings taken.

Broadband.	K&U&Th	U&Th	
55cps	5cps	41cps	Surface.
80cps	8cps	51cps	8"hole

Cu 12ppm Pb 170ppm Zn 170ppm
Ag <1ppm Mo 1ppm Au 0.05ppm
U 5.5ppm

F16 A grab sample over approximately 20m from gossanous and lesser gossanous quartz.

Cu 32ppm Pb 30ppm Zn 220ppm
Ag <1ppm Mo 2ppm Au<0.05ppm
U 4.3ppm

F18 A sample of gossanous material.

Cu 12ppm Pb 15ppm Zn 190ppm
Ag <1ppm Mo 1ppm Au <0.05ppm
U 0.4ppm

F23 A strongly gossanous sample from limonitic, kaolinised shale.

Cu	28ppm	Pb	35ppm	Zn	110ppm
Ag	1ppm	Mo	1ppm	Au	0.05ppm
U	0.4ppm				

There is an anomalously high value of Au, 5.5ppm, north east of Clara St Dora. The sample was from a location which is not near any gold mines.

Stream sediment samples were also taken from the Hermit Hill area and Venable Springs. Some high values of molybdenum were found in the samples taken from the Hermit Hill area.

A composite of F29, F31 and F32 was taken and high values of molybdenum, titanium, zircon, arsenic and thallium were found. (20, 1000, 150, 600 and 150 respectively) These samples were also from the Hermit Hill region.

From our reconnaissance, we have discovered there are large areas of massive sulphides in the northern part of the licence. As yet, we can find no reason for the concentrations in this area. Further work will be done in these areas to try determine the source of these.

[redacted]

Aerial Reconnaissance.

Because of the area covered by the licence it was decided that the best way to do a preliminary study was by air. A helicopter was hired from Lloyd Helicopters Pty. Ltd. and an aerial survey was carried out using a G15 - 3 Spectrometer.

Due to delays in drafting, the maps showing the helicopter flight paths and the total count of radiation per second are unavailable.

The highest values recorded were 40cps in the Hermit Hill area and west of North Creek. Interpretation of the results obtained is difficult without the maps. Further details of this program will be described in our next report.

CONCLUSIONS.

[redacted]

Although the initial exploration hasn't shown outstanding results, work will proceed in the licence.

The surface sampling cannot be taken as indicative of the economic potential of the area as the strata of interest lie 500 - 1000m below the surface.

Further sampling at depths will show if the area will be economically viable in the future.

P.J. O'Rourke

P.J. O'ROURKE. per W

Exploration Manager.

APPENDIX LIST.

Appendix 1. Expenditure

Appendix 2. Assay Results

Appendix 3. Petrographic Description

Appendix 4. Map 1

APPENDIX 1.

[redacted]

EXPENDITURE.

Photographs, drawings and maps.	994.75
Motor vehicle costs.	1316.29
Travel and freight.	1567.59
Accomodation and food.	862.50
Assays and mineralogical expenses.	721.00
Consumable stores and equipment hire.	598.29
Helicopter survey.	7765.83
Wages and Salaries.	3730.00
Overheads and Administration.	1755.00
Total	19311.35

[redacted]

APPENDIX. 2

South Aust E.L.

[redacted]

The Australian Mineral Development Laboratories

Flemington Street, Frewville, South Australia 5063
Phone Adelaide 79 1662
Telex AA 82520

Please address all correspondence to
P.O. Box 114 Eastwood SA 5063
In reply quote:

amdel

NATA CERTIFICATE

3/665/0 - AC 740/81

12 September 1980

Mr P J O'Rourke
Central Coast Exploration NL
PO Box 60
NORTH QUAY 4000

REPORT AC 740/81

YOUR REFERENCE: Order No F 1/80

IDENTIFICATION: As listed

DATE RECEIVED: 8 August 1980

Enquiries quoting AC 740/81 to the Manager please.

D.K. Rowley
Manager
Analytical Chemistry Division

for Norton Jackson
Managing Director

cc The Admin Officer
GPO Box 998
SYDNEY NSW 2001

dam

Pilot Plant: Osman Place
Thebarton S.A.
Telephone 43 8053
Branch Laboratory: Perth

amdel [redacted]

Analysis code C1 Report.AC 740/81 Page 1

NATA Certificate Order F1/80 Results in ppm

Sample	Cu	Pb	Zn
F 1	450	30	30
F 2	12	10	4
F 3	18	10	44
F 4	6	10	10
F 5	10	10	8
F 6	22	5	50
F 7	6	5	12
F 8	22	5	<2
F 9	8	5	12
F 10	12	10	240
F 11	16	5	110
F 12	230	5	30
F 13	6	<5	2
F 14	36	15	450
F 15	12	170	170
F 16	32	30	220
F 17	32	15	32
F 18	12	15	190
F 19	10	10	60
F 20	4	10	22
F 22	36	35	75
F 23	28	35	110
F 24	28	<5	65
F 25	22	5	110
F 26	16	<5	6
Detn limit	(2)	(5)	(2)

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Analysis code Cl | Report AC 740/81 | Page 2

NATA Certificate | Order F1/80 | Results in ppm

Sample	Cu	Pb	Zn	Co
F 27	6	<5	2	5
F 28	<2	<5	4	5
F 29	8	5	<2	5
F 30	2	<5	16	15
F 31	<2	5	2	5
F 32	6	5	<2	5
F 33	4	5	8	<5
F 34	2	5	4	<5
F 35	2	5	38	10
F 36	6	<5	6	10
F 37	6	<5	2	20
F 38	6	5	2	10
F 39	44	<5	32	25
F 40	50	5	6	5
Detn limit	(2)	(5)	(2)	(5)

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Analysis code C1/C2 Report AC 740/81 Page 3

NATA Certificate Order F1/80 Results in ppm

Sample	Cu	Pb	Zn	Mo
FSS 1	38	10	20	13
FSS 2	18	10	24	13
FSS 3	14	10	44	6
FSS 4	18	15	55	1
FSS 5	10	10	40	3
FSS 6	10	10	26	9
FSS 7	14	10	28	4
FSS 09	20	10	65	6
FSS 10	18	10	65	6
FSS 11	20	10	80	4
Detn limit	(2)	(5)	(2)	(1)

amdel

Analysis code C2 | Report AC 740/81 | Page 4

NATA Certificate | Order F1/80 | Results in ppm

Sample	Ag	Mo
F 1	1	1
F 2	<1	1
F 3	<1	1
F 4	<1	1
F 5	<1	1
F 6	<1	<1
F 7	<1	2
F 8	<1	1
F 9	<1	1
F 10	<1	1
F 11	<1	1
F 12	<1	11
F 13	<1	3
F 14	<1	2
F 15	<1	1
F 16	<1	2
F 17	<1	2
F 18	<1	1
F 19	<1	1
F 20	<1	1
F 22	<1	<1
F 23	<1	<1
F 24	<1	1
F 25	<1	<1
F 26	<1	<1
F 27	<1	1
F 28	<1	46
F 29	<1	4
F 30	<1	12
F 31	<1	50
F 32	<1	32
F 33	<1	3
F 34	<1	5
F 35	<1	1
F 36	<1	<1
F 37	<1	1
F 38	<1	2
F 39	<1	11
F 40	<1	1
Detn limit	(1)	(1)

amdel 24

Analysis code C3/1 Report AC 740/81 Page 5

NATA Certificate Order F1/80 Results in ppm

Sample	Au
F 1	0.20
F 2	5.50
F 3	<0.05
F 4	<0.05
F 5	<0.05
F 6	<0.05
F 7	0.05
F 8	<0.05
F 9	<0.05
F 10	<0.05
F 11	<0.05
F 12	0.05
F 13	<0.05
F 14	<0.05
F 15	0.05
F 16	<0.05
F 17	<0.05
F 18	<0.05
F 19	<0.05
F 20	<0.05
F 22	<0.05
F 23	<0.05
F 24	<0.05
F 25	<0.05
F 26	<0.05
F 27	<0.05
F 28	<0.05
F 29	<0.05
F 30	0.05
F 31	<0.05
F 32	<0.05
F 33	<0.05
F 34	<0.05
F 35	<0.05
F 36	0.05
F 37	0.10
F 38	0.05
F 39	<0.05
F 40	0.05

Detn limit (0.05)

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Analysis code J3/2 | Report AC 740/81 | Page 6

NATA Certificate | Order F1/80 | Results in ppm

Sample	U
F 1	5.5
F 2	1.1
F 3	7.9
F 4	0.8
F 5	1.6
F 6	2.6
F 7	1.5
F 8	0.4
F 9	0.3
F 10	1.9
F 11	1.5
F 12	3.7
F 13	0.6
F 14	4.5
F 15	5.5
F 16	4.3
F 17	2.4
F 18	0.4
F 19	1.3
F 20	12.
F 22	4.7
F 23	4.5
F 24	4.5
F 25	4.2
F 26	1.6
Detn limit	(0.1)

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[redacted]

Analysis code J3/2	Report AC 740/81	Page 7
NATA Certificate	Order F1/80	Results in ppm

Sample	U
F 27	1.5
F 28	0.4
F 29	0.6
F 30	0.4
F 31	0.6
F 32	0.2
F 33	0.6
F 34	0.4
F 35	0.5
F 36	0.9
F 37	2.8
F 38	0.9
F 39	2.6
F 40	1.4
Detn limit	(0.1)

amdel [redacted]

Analysis code J3/2 Report AC 740/81 Page 8

NATA Certificate Order F1/80 Results in ppm

Sample	U
FSS 1	1.9
FSS 2	2.5
FSS 3	2.6
FSS 4	1.7
FSS 5	1.6
FSS 6	1.4
FSS 7	2.8
FSS 09	1.9
FSS 10	1.2
FSS 11	1.8
Detn limit	(0.1)

AMDEL ANALYTICAL SERVICE

 [redacted]

JOB NO 740/81 Semi-Quantitative Spectrographic Analysis Schemes A1, A2, A3, A4, A5, A7, A8 & A9

Results in [illegible] unless otherwise stated. Detectio[illegible]imits in brackets

* SCAN

	SAMPLE NO.	COMPOSITE (F29 F31 F32)
* A1	Ba (200)	200
	Be (1)	X
	Ce (300)	X
	Co (5)	X
	Cr (20)	X
	La (50)	X
	Mn (10)	30
	Mo (3)	20
	Nb (20)	X
	Ni (5)	20
	Sc (3)	X
	Sr (50)	50
	Ta (100)	X
	Th (100)	X
	Ti (100)	1000
	V (10)	15
	W (50)	X
	Y (10)	10
	Yb (1)	2
	Zr (10)	150
* A2	Ag (0.1)	0.1
	As (50)	600
	Bi (1)	X
	Cd (3)	X
	Cu (1)	5
	Ga (1)	2
	Ge (1)	X

	SAMPLE NO.	COMPOSITE (F29 F31 F32)
A2 *	In (10)	X
	Pb (1)	4
	Sb (30)	X
	Sn (1)	X
	Zn (20)	X
A3 *	Au (3)	X
	P (100)	X
	Te (20)	X
	Tl (1)	150
A4	Li (1)	
	Na (50)	
A5	Cs (30)	
	K (5)	
	Rb (10)	
A8	B (3)	
A9	Al (100)	
	Ca (100)	
	Fe (100)	
	Mg (100)	
	Si (100)	

Results are semi-quantitative. Elements apparently present in concentrations of economic interest should be redetermined by an appropriate accurate analytical technique. X = Not detected at limit quoted

[redacted]

APPENDIX. 3.

EL 634 Finnis Springs.

amdel

EXAMINATION OF SAMPLES F1M-F22M

Central Coast Exploration NL,
Brisbane, Qld.

3/665/0-GS740/81 August 1980

service report

THE AUSTRALIAN MINERAL DEVELOPMENT LABORATORIES, FLEMINGTON STREET, FREWVILLE, SOUTH AUSTRALIA 5063

amdel

[redacted]

The Australian
...ral Development
Laboratories

...on Street, Frewville,
South Australia 5063
...e Adelaide 79 1662
Telex AA 82520

Please address all
correspondence to
. Box 114 Eastwood
SA 5063

In reply quote: GS3/665/0

27 August 1980

Central Coast Exploration NL,
Post Office Box 60,
NORTH QUAY,
BRISBANE, 4000.

Attention: P.J. O'Rourke

REPORT GS 740/81

YOUR REFERENCE: AMDEL application of 8 August 1980

MATERIAL: 22 rocks

IDENTIFICATION: F1M-F22M

DATE RECEIVED: 8 August 1980

WORK REQUIRED: Petrography, mineragraphy and mineral identification

Investigation and Report by: Dr Brian Steveson

Manager, Geological Services Division: Dr Keith J. Henley

Keith Henley

for Norton Jackson,
Managing Director.

cc Central Coast Exploration NL,
GPO Box 998,
SYDNEY, 2001.

meo/21

Plant: Osman Place
Thebarton S.A.
Telephone 43 8053
...h Laboratory: Perth

 [redacted]

Sample: F2M; TS43501

Rock Name:

Quartzite (metamorphosed sandstone)

Hand Specimen:

The sample is a typical quartzite in that it has a grey colour and a markedly conchoidal fracture. There are specks of sulphide on the surface but no green mineral could be seen.

Thin Section:

Approximately 80-85% of the rock consists of quartz and the remainder of feldspar and minor heavy minerals and iron oxide. The sample has a granular texture as a result of crystallization of quartz under metamorphic conditions.

The quartz forms crystals ranging in size up to about 0.2 mm and it is possible that some of the larger crystals may pseudomorph the size of original detrital grains. Elsewhere the quartz is distinctly finer-grained than this and forms what is clearly a metamorphic texture. There is considerable interlocking of the grains and many show undulose extinction. In contrast, feldspar is generally present as crystals about 0.15 mm in size and it is thought that these are original detrital crystals which have not been recrystallized during metamorphism (i.e. they are relics of the original sediment). The feldspar is present both as plagioclase and potassium feldspar, with probably a greater proportion of the latter. In many instances the feldspar can only be distinguished by somewhat turbid alteration, slight differences in refractive indices and a tendency to form subround or even round grains. Tourmaline forms a few fairly round grains also and these are thought to be relics of original heavy minerals.

The sample contains a considerable amount of dispersed ferruginous material and rather indefinite patches of a brownish clay. These may well be of secondary origin, possibly associated simply with weathering of the rock. Some of the red translucent goethite/limonite is particularly abundant in a cross-cutting fracture system.

The sample is a metamorphosed sandstone in which quartz has been completely recrystallized, yet feldspar and tourmaline retain their original detrital form.

Sample: F3M; TS43502

Rock Name:

Dolomitized shale

Hand Specimen:

This is a dark grey rock with a very fine-grained, aphanitic texture. The hand specimen is tabular and fairly soft and appears to be some kind of shaley sediment.

Thin Section:

The bulk of the thin section, in fact, consists of a carbonate mineral which is probably dolomite. For the most part this forms a monomineralic mosaic of equant anhedral crystals generally not more than about 0.03 mm in size. The dolomite contains semiopaque, dusty material and the patchy distribution of this may have pseudomorphed the texture of the rock originally replaced by the dolomite. Elsewhere in the sample there are clearer and coarser-grained patches which are dominated, still, by dolomite. Many of these patches are elongate and may represent original lenses of sandstone in an otherwise shaley sediment. The largest of these patches is about 2 mm in length and approximately 1 mm in width. Dolomite, muscovite, quartz and plagioclase are all present as equant to tabular crystals of the order of 0.1 mm in size. The feldspar is clear and fresh and could well be of secondary origin in some way. The crystals of feldspar have been partly replaced by dolomite so that they do not retain any distinctive shape. Other coarser-grained patches are less well-defined than this one and generally are slightly obscured by ferruginous material, apart from a few notably coarse-grained dolomitic aggregates.

The sample is, therefore, composed of dolomite (about 90%) with minor coarse-grained minerals, particularly muscovite, quartz and plagioclase. The fine-grained texture and the speckled appearance of much of the dolomite suggest that the sample was derived from the dolomitization of some kind of fine-grained sediment. If this is the case, then the somewhat coarser-grained silicate minerals mentioned above may be of secondary origin and may be associated with, perhaps, some metasomatism of some kind.

Sample: F4M; TS43503 34

[redacted]

Rock Name:
Chloritized and dolomitized sandstone

Hand Specimen:
This is a tabular, compact rock which has a rather characteristic finely granular texture and a mottled green and pink colour.

Thin Section:
This is a rather unusual rock consisting essentially of a granular mosaic of quartz and dolomite. The quartz is present throughout the thin section as equant anhedral crystals commonly 0.2-0.3 mm in size. These form in a more or less granular mosaic with only a small amount of interlocking in many parts of the section. The quartz crystals tend to be separated from each other by thin films of ferruginous material or iron-stained clay. The similarity in size of the quartz crystals suggests that they are derived from original sand grains. Interspersed amongst the quartz crystals is about 30% of dolomite. Individual aggregates of dolomite are similar in both size and shape to the quartz crystals and they are thought to be derived either from simply the recrystallization of original limestone clasts or, more likely, replacement of a particular type of detrital material now completely removed from the rock (?plagioclase ?limestone). The individual patches of dolomite virtually all show a texture involving a central patch of fine-grained dolomite partly obscured by ferruginous material and clearer, radiating crystals away from this.

Green minerals consist partly of chlorite and, to a smaller extent, of amphibole and together comprise about 10% of the volume of the rock. The minerals are widely distributed throughout the sample and tend to be associated with intergranular spaces and the films of iron oxide/hydroxide. It seems likely that these minerals are derived from the alteration of original clays.

The sample is interpreted as being originally a sandstone which has undergone a process of extensive dolomitization and replacement of original clay/micas by chlorite. These processes probably involved both metamorphism and metasomatism of the rock. It seems unlikely that all of the dolomite would be derived from sources within the sample and some must have been introduced.

Sample: F5M; TS43504

Rock Name:
Altered kaolinitic schist or shale

Hand Specimen:
This is a friable rock with a pale cream colour. The sample is light in weight and probably consists largely of clay.

Thin Section:
This is an extremely altered rock and the thin section consists very largely of clay more or less obscured by ferruginous material. The sample has a banded texture but it is not clear whether it is an altered sediment or metamorphic rock. There are rare crystals of tourmaline and these generally appear to be angular and subhedral in shape which may be an indication that the sample was originally a schist rather than a sedimentary rock.

The bulk of the sample has a more or less turbid, grey to slightly pink colour and consists of clays with a fine-grained texture but nevertheless showing a bulk extinction. For the most part the clay has a low to moderate birefringence but there are patches with bright second order birefringence colours which may be sericitic material, or possibly illite. Over a considerable area of the thin section the exact nature of the clays cannot be determined, even to this extent, because of the presence of translucent, red, ferruginous material. Quartz is present in the rock as a minor to trace component and is generally associated with the weakly birefringent clays. It forms angular crystals generally not more than 0.5 mm in size.

This is a fine-grained rock which, apart from rather chaotic variations in the amount of ferruginous material and the nature of the clays, appears to be more or less homogeneous. There are certainly no textural features to indicate whether it was originally a tuff or sediment, but the presence of angular crystals of tourmaline (and a few of quartz) is an indication that the rock may well have been metamorphosed before undergoing the extent of alteration now shown by the abundance of clay and micaceous components.

[redacted]

Sample: F13M; TS43505

Rock Name:
Altered quartz-rich schist

Hand Specimen:
The bulk of the rock is a more or less orange to pale brown, fine-grained lithology with an indefinite banded texture. At one edge of the sample there is a more massive, fine-grained, green rock. The hand specimen is friable but overall has a tabular appearance and hence has been described as a schist.

Thin Section:
The bulk of the sample consists very largely of quartz in a very finely granular mosaic. It is possible that there is a small amount of phyllosilicate intergrown with the quartz but this cannot be unambiguously identified in the thin section and the sample is distinctly more quartz-rich than would appear from the hand specimen. Individual quartz crystals are generally not more than about 0.05 mm in size and they are generally obscured by a considerable amount of dispersed, translucent, ferruginous material. The distribution of the latter is as much responsible for the macroscopic texture of the rock as any other petrographic feature. To some extent the ferruginous material occurs in a system of veins but some is also widely distributed throughout the sample. In places, the ferruginous material has a yellow colour and may well be jarosite. The granular texture of the quartz is further evidence that the sample should be regarded as being of metamorphic origin rather than being an unmodified sedimentary rock.

The green lithology at one side of the sample is very distinctive in thin section since it consists of a very pale brown, pleochroic, mica mineral. The mineral is probably phlogopite (the magnesium analogue of biotite) and in most of this part of the rock the mineral occupies about 80-90% of the thin section with small amounts of finer-grained quartz in between the phyllosilicate crystals. There is a wide range of crystal size of the phlogopite up to about 0.1 mm. The crystals of phlogopite have a random arrangement and most are fairly equant in the plane of the thin section, so this part of the rock, also, has a rather random and granular texture. The origin of the phlogopite is rather difficult to determine since the mineral is generally associated with magnesium metasomatism. It is unlikely that the original rock contained as much magnesium as is now probably present in the phlogopitic lithology, and hence it seems likely that some of this element has been introduced into the rock during a period of metamorphism or alteration.

The sample is, therefore, a fine-grained banded lithology consisting of fine-grained quartz in parts and elsewhere of a mosaic of fairly fine-grained phlogopite.

Sample: F14M; TS43506

Rock Name:

Metamorphosed, fine-grained sediment

Hand Specimen:

This is a weathered but fairly compact rock with a well-defined foliation. The bulk of the rock is a greenish colour and is fairly massive, but adjacent to this there are different coloured bands generally 1-5 mm in width. These bands are variously white, purple and grey in colour.

Thin Section:

The bulk of the rock consists of a fine-grained granular and interlocked mosaic of quartz with minor phyllosilicates. In this part of the rock the average crystal size of the quartz is of the order of 0.05 mm but the phyllosilicates tend to be a little coarser-grained. The quartz is probably derived from pre-existing sedimentary rock by complete re-crystallization. The phyllosilicates range in concentration probably from about 5 to 30% and this probably represents original variations in the amount of clay in the original sediment. For the most part the phyllosilicate is colourless muscovite but some shows a pale brown shade and may be phlogopitic. Minor components of this part of the rock are opaque and semiopaque ferruginous material generally deposited in narrow zones parallel to the bedding in the rock.

In the more thinly laminated parts of the rock there are more marked variations in mineralogy, ranging from virtually pure quartz to pure muscovite/sericite lithologies. These are generally marked by sharp boundaries, particularly on one side of the bed. At the other side, although the boundaries are gradational, this occurs over only a very short distance and, again, the characteristics are thought to reflect those of the original sediment. In one or two of the finer-grained lithologies iron-stained muscovite occurs in a cross-cutting veinlet. This is some evidence of the relatively late mobilization of this mineral and it is possible that some of the muscovite/sericite has been introduced into the rock during a post-metamorphic phase of ?brecciation and metasomatism.

The sample is interpreted as being a thinly bedded shale or siltstone, with alternating argillaceous and quartzitic beds, which has been subjected to a moderate degree of metamorphism and, possibly, metasomatism.

Sample: F15M: TS43507

Rock Name:
Limonitic, fine-grained sandstone (quartzite)

Hand Specimen:
This is a compact, tabular rock with a subconchoidal fracture. Weathered surfaces of the sample are more or less brown in colour but broken fresh surfaces have a more pale pink colour. There are patches and cross-cutting veins of ferruginous material.

Thin Section:
The bulk of the rock consists of a homogeneous, interlocked mosaic of quartz with minor feldspar. The quartz crystals have been completely recrystallized during metamorphism but the close sizing probably reflects the sorting of the original rock. The average crystal size is about 0.1-0.15 mm. Feldspar probably comprises 5-10% of the volume of the rock and most is present as perfectly fresh microcline with a minor amount of albitic plagioclase. There is a tendency for the feldspar to occur as subround, tabular crystals and it is possible that these have not been recrystallized during the metamorphism of the rock. Other relics of the original sandstone are widely scattered detrital heavy minerals of which tourmaline is by far the most abundant.

Other parts of the rock have a rather more variable texture, largely as a result of the presence of dispersed secondary ferruginous material. In places, this occupies a relatively large proportion of the rock and it may well have partly replaced pre-existing quartz and/or feldspar. The ferruginous material is probably a relatively late addition to the rock and it is likely that the sample is basically a homogeneous, fine-grained feldspathic sandstone which has undergone metamorphism resulting in the recrystallization completely of the quartz, but not of feldspar and heavy minerals. The introduction of ferruginous material (and a little mica) is probably entirely a post-metamorphic event.

Sample: F16M: TS43508 39

Rock Name:
Metamorphosed argillaceous sandstone

Hand Specimen:
This is a somewhat irregularly banded, more or less grey rock which is fairly compact. The cut surface shows some reddish bands but most are either grey or cream in colour. Overall, they show a laminar foliation but, in detail, many of the bands are somewhat irregular.

Thin Section:
The sample consists very largely of two minerals, quartz and mica. The proportions of these vary considerably from place to place in the section and probably these proportions reflect the composition of the pre-metamorphic sediment from which this rock was derived.

For the most part, quartz is present as equant anhedral crystals which have an average size of about 0.1 mm. These crystals occur in a granular mosaic which is almost completely of metamorphic origin. In a few places there are somewhat larger and rounded quartz crystals which may be relics of the original detrital material; it is not clear why these have not been recrystallized. There are some irregular bands which consist almost entirely of very fine-grained mica and in some places there are beds in which similarly fine-grained material occurs around the edges of quartz crystals. Elsewhere in the rock there are distinctly large crystals of mica as much as 0.2 mm in size. All of the mica shows relatively high birefringence and pleochroism in pale shades of brown, and appears to be a mineral akin to phlogopite. The mineral is clearly of metamorphic or metasomatic origin and it is thought likely that it has been derived from the recrystallization of the argillaceous component of the original rock.

Minor components of the rock are dispersed, fine-grained, ferruginous or titaniferous oxides which generally occur as finely speckled material associated with fine-grained mica. Also present in the rock are a few compact, equant crystals of a refractive mineral with low birefringence. Some of these crystals are as much as 0.15 mm in size. The mineral could not be specifically identified by optical means but it may be garnet showing somewhat anomalous birefringence.

This sample is almost certainly a sedimentary rock which has been metamorphosed and, possibly, metasomatised. The rock now consists very largely of subequal amounts of quartz and a micaceous mineral which is probably phlogopite.

[redacted]

Sample: F19M; TS43511

Rock Name:
Calcareous chlorite schist

Hand Specimen:
This is a typical fine-grained schistose rock which has a tabular appearance in the hand specimen. Weathered surfaces are slightly brown in colour but the cut surface of the sample has an aphanitic, grey appearance with lamellar banding.

Thin Section:
This is an extremely fine-grained rock, in general, although there are isolated patches of somewhat coarser-grained material. As far as can be determined, the sample consists of about equal amounts of quartz and phyllosilicate.

The bulk of the sample has a fine-grained lepidoblastic texture and consists of a mosaic of granular quartz and oriented crystals of phyllosilicate. The latter appear to be chloritized biotite. Individual flakes cannot be distinguished, even under high magnification, but the material has a somewhat variable colour and a low birefringence and is thought, therefore, to be chlorite. Somewhat browner patches may well be remnants of biotite. Individual crystals of quartz and phyllosilicate are generally not more than about 0.03 mm in size.

Isolated coarser-grained patches generally consist of quartz, plagioclase and calcite. These patches are randomly distributed throughout the rock and are generally rather irregular in shape. Typically they consist of crystals about 0.05 mm in size. These crystals are equant anhedra. Minor components of the rock are small crystals of angular tourmaline and a few relatively large flakes of muscovite and kaolinite. The presence of the latter, as well as the calcite, probably suggests that the sample has undergone some late-stage alteration with the introduction of calcite and a little authigenic kaolinite.

The sample is a metasedimentary rock now consisting very largely of very fine-grained quartz and chlorite with a fine laminar schistosity.

41 [redacted]

Sample: F20M; TS43512

Rock Name:
Secondary quartz-mica rock

Hand Specimen:
This is a grey rock with a somewhat weathered appearance. Fresh broken and cut surfaces have a rather variable texture with some crystals of mica up to about 2 mm in size in otherwise rather fine-grained material.

Thin Section:
The bulk of the rock consists simply of a mosaic of quartz and mica. The mica is a birefringent variety with faint pleochroism in shades from yellow to colourless. This is the same mica as has been described as phlogopite in some earlier samples. There are about equal amounts of this mineral and quartz. The texture of these two phases varies markedly from place to place in the thin section, but the variations, although crudely banded, may well be a result of the mode of alteration of the rock rather than reflecting, directly, variations in the precursor. The most typical texture is a very fine mosaic consisting largely of the micaceous mineral. In parts of the rock such as this, few mica crystals are more than about 0.1 mm in size and there is a gradation down to extremely fine-grained material. Somewhat coarser zones and patches tend to contain more quartz and range up to quartz-rich patches containing crystals as much as 0.2-0.4 mm in size. Despite variations in the texture and crystal size from place to place in the thin section, the quartz and mica generally have a similar size to each other in all parts of the rock. In addition, the texture is invariably random and essentially granular with considerable interlocking where quartz is abundant.

At one end of the section there is a more heterogeneous zone which appears to have been a locus of alteration; this consists largely of micaceous minerals which are intergrown with opaque and semi-opaque material on a small scale. It is thought likely that the mica is somewhat altered material, corresponding to the pale brown mica in the bulk of the rock. Also present in this part of the sample are narrow zones of very fine-grained calcite. It appears that the calcite and the opaque and semi-opaque material are products of the alteration and there has also been some modification of the abundant micaceous mineral.

The origin of this rock is rather difficult to determine but it consists essentially of recrystallized, secondary quartz and ?phlogopite in a granular but rather variable texture.

Sample: F22M; TS43513

Rock Name:
Deformed and recrystallized sandstone

Hand Specimen:
A tabular, grey rock with a medium-grained texture. The sample is speckled with small patches of green and less common blue material. Both of these are extremely fine-grained.

Thin Section:
A very large proportion of the thin section consists of quartz but there is of the order of 10% of feldspar and traces of phyllosilicate. The most distinctive feature of the rock is, however, the texture. About 50% of the rock consists of equant quartz crystals which range in size from about 0.2 to 0.6 mm. These crystals generally show marked undulose extinction but most have a roughly subround outline and they are interpreted as being relics of original detrital quartz grains. Between these, there is a much finer mosaic of quartz, sometimes intergrown with small amounts of phyllosilicate. The crystal size of this fine-grained material ranges from less than 0.01 mm to about 0.05 mm. The texture of the fine-grained material is invariably granular and interlocked. Feldspar most commonly occurs as relatively large crystals which are also interpreted as being relics of detrital grains. Some of these crystals are as large as those of quartz but many tend to be of the order of 0.1-0.3 mm in size. Most of the feldspar crystals show considerable alteration but both plagioclase and potassium feldspar can be specifically identified. There are only traces of feldspar amongst the mosaic of fine-grained quartz.

Phyllosilicates are mostly concentrated in a few cross-cutting bands less than 0.2 mm in width. The phyllosilicate is generally clear and is probably secondary muscovite. The sample is speckled with opaques, particularly in one patch where there are small acicular crystals of ?hematite.

needle like

There are small patches of blue and green minerals which are extremely fine-grained. These will be identified by X-ray diffraction analysis (see below). Petrographically, these minerals appear to be azurite and malachite.

Sample: FIM; PS28787

Rock Name:
Weathered sandstone

Hand Specimen:
The sample is a buff-coloured sandstone which shows considerable weathering. The cut surface is distinctly cavernous where there has been weathering out of ferruginous material. The outer surfaces are brown in colour.

Polished Section:
The polished section contains only trace amounts of opaque material and most consists of specks of iron oxide completely enclosed in quartz, and hence distinctly of primary origin. As far as can be determined the small scraps of opaques are probably hematite and few crystals are more than 0.02 mm in size.

At one end of the polished section, particularly, there are very poorly developed boxworks, most of which consist of thin films of goethite/limonite. The cellular texture generally does not persist beyond a size of about 0.2-0.3 mm. The cells are equant but irregular in shape and do not pseudomorph any particular pre-existing mineral.

The sample is a sandstone containing only a minor amount of opaque material but, in some places, this shows some evidence of a boxwork texture.

Sample: F6M; PS28788

Rock Name:
Vein pyrite

Hand Specimen:
The bulk of the hand specimen consists of dark, very fine-grained material within which are numerous veinlets of pyrite. Many of these are of the order of 1-2 mm in size but there are associated patches of massive pyritic material up to 1 cm. Around the periphery of this aggregate is apparently brecciated, brown material which appears to be relatively siliceous.

Polished Section:
The opaque phases in the polished section occupy about 60% of the area of the section and, apart from traces of ?sphalerite, consist entirely of pyrite. The pyrite occurs in well-defined veinlets which range in width up to about 1.5 mm. The wider veinlets tend to consist simply of massive pyrite but there are apophyses of pyrite and non-opaques in fine-grained granular intergrowths.

Associated with the pyrite in two or three places in the polished section are small equant crystals of a grey phase with red internal reflections. Individual crystals are no more than about 0.04 mm in size and the mineral is thought to be probably sphalerite (?goethite).

This sample is a silicate rock of some kind which has been veined and invaded on a large scale by pyrite. There are traces of ?sphalerite associated with the pyrite but no other sulphide minerals were identified.

Sample: F7M; PS28789

Rock Name:
Vein pyrite

Hand Specimen:
This sample is similar to F6M in that it consists of a grey, fairly fine-grained intergrowth of pyrite and grey siliceous material. At one edge of the sample there is orange to buff coloured material which is free from pyrite.

Polished Section:
The polished section contains only pyrite and ?sphalerite as the opaque phases and the grey mineral is tentatively identified as sphalerite and comprises less than 1% of the area of the section.

Pyrite forms in a widely dispersed network or vein system and a few aggregates of the mineral are as much as 0.5 mm in size. Larger patches tend to be monomineralic pyrite but much of the mineral is finely intergrown with non-opaques on a scale of the order of 0.05-0.1 mm. There are a few distinct, narrow veinlets but the pyrite more generally forms in a pervasive network system. The grey phase occurs as a few equant anhedral crystals not more than 0.03 mm in size. These are generally spatially associated with the pyrite although rarely completely enclosed by it.

Sample: F8M; PS28790

Rock Name:

Finely disseminated quartz in ?sheared volcanic rock

Hand Specimen:

The bulk of the sample is more or less white in colour and appears to be siliceous. The material is fine-grained, apart from one or two glassy quartz crystals.

Interleaved with this white material are thin discontinuous veins and bands of dark aphanitic material with which the pyrite appears to be largely associated. As far as can be determined from the hand specimen the sample has the appearance of some kind of sheared and deformed volcanic rock.

Polished Section:

In the bulk of the rock, which is equivalent to the dark material in the hand specimen, pyrite occupies about 20% of the volume and occurs as equant anhedral crystals. These have a markedly bimodal crystal size distribution and there is a population of large crystals ranging in size from about 0.15 mm to approximately 0.5 mm. Also present, however, are numerous minute, almost submicroscopic, specks of pyrite. These crystals occur completely randomly over the area of this part of the briquette. Some of the larger crystals have rather porous marginal zones. It is noticeable that some parts of the briquette are completely free from pyrite crystals and these may well be ?phenocrysts of ?quartz, whereas the pyrite occurs both as phenocrysts and widely disseminated in the groundmass of the rock.

One part of the polished section corresponds to the sheared white material and this contains an equally wide size range of pyrite but in material which has a rather brecciated appearance. Apart from one very large aggregate of pyrite, most of the mineral occurs as equant, rather angular grains generally up to about 0.05 mm in size.

Sample: F9M; PS28791

Rock Name:

Disseminated pyrite

Hand Specimen:

This sample is similar to others described in this collection in that it consists largely of grey, fine-grained material impregnated with a considerable amount of pyrite. Around this there are more weathered brown and orange patches of material which appears to be free from sulphide.

Polished Section:

The great bulk of the pyrite in the polished section occurs in one contiguous aggregate which is almost 1 cm in size. The pyrite appears to be massive and granular but is characterised particularly by the presence of an oxidized rim of goethite. This consists of rather porous and variable, blue to grey material, sometimes present as a rim of the order of 0.3 mm in width. There has also been some penetration of the goethite along fractures in the pyrite. The presence of this unequivocably goethitic material suggests that the few small patches of grey material identified in previous samples may well be goethite, also.

Elsewhere in the polished section pyrite occurs as rather fine-grained material which is intergrown with the non-opaques in a granular manner. There are one or two veinlets of pyrite less than 0.01 mm in width, also.

Sample: F10M; PS28792

Rock Name:
?Sandstone with disseminated pyrite

Hand Specimen:
The bulk of this rock is grey and aphanitic and contains widely disseminated pyrite in patches up to about 3 mm in size. Within this are white or grey subcircular patches up to 1 cm in size. The hackly fracture of the rock is a clear indication that it is largely siliceous but it is not possible to say with certainty whether it is, for example, a quartzite or some kind of volcanic rock.

Polished Section:
The only opaque phase in the polished section is pyrite and this mineral occurs in networks, veins and patches commonly of the order of 2-3 mm in size. There are also isolated discrete crystals ranging from virtually submicroscopic up to about 0.3 mm. The bulk of the pyrite occurs in fairly large patches which are more or less porous and there are textures which suggest that the pyrite has been introduced and penetrated along grain or crystal boundaries. In a few places there are vein-like apophyses away from such pyritic aggregates. The fine-grained pyrite is randomly distributed over the area of the polished section.

[redacted]

Sample: F11M; PS28793

Rock Name:
Vein pyrite in ?sandstone

Hand Specimen:
The rock consists of two phases; one is a pink, medium-grained, siliceous rock and within this there are rather diffuse zones of grey material with which pyrite is closely associated. In many instances the pyrite can be seen to occur in specific curved fracture zones and these appear to be rimmed with the grey material with the disseminated pyrite.

Polished Section:
Pyrite is the only opaque phase in this rock and it occurs partly in specific vein systems and also in networks and as discrete crystals. The networks are the most distinctive since the pyrite forms a contiguous aggregate around grains/crystals of quartz which are generally of the order of 0.2-0.3 mm in size. Elsewhere the pyrite simply forms irregular but generally equant aggregates, commonly not more than about 0.5 mm in size. In a few places in the polished section there is an extension of the network type of material into a rather irregular vein.

In general, the textures in the sample suggest that the pyrite has been introduced and it is likely that this has been along some system of fractures and veins.

Sample: F12M; PS28794

Rock Name:

Marcasite-bearing sandstone

Hand Specimen:

Superficially, the sample appears to be massive pyrite but, in fact, the rock is not sufficiently dense for this and within it small grains of quartz(?) can be seen. The hand specimen is notably massive and homogeneous.

Polished Section:

The polished section has a classic texture in which rounded grains of quartz are completely surrounded by a network of marcasite. The sample is clearly a sandstone and whatever the original intergranular component was, it has now been completely replaced by effectively massive marcasite. This mineral forms the whole of the intergranular space in a contiguous network in which individual patches of marcasite are generally not more than about 0.2 mm in size. The quartz grains vary in average size from place to place in the polished section; in some places the average grain size appears to be about 0.5 mm but elsewhere about 0.15 mm. The grains are fairly well rounded and appear not to have been altered by the marcasite.

In one place in the polished section there is a grey patch which is probably goethite. This patch of material is completely enclosed in the marcasite and is only about 0.1 mm in size. Apart from this, the sample contains, apparently, only quartz and marcasite.

Sample: F18M; PS28823

[redacted]

Rock Name:

Secondary carbonate and quartz rock

Hand Specimen:

This is a banded rock with the buff colour which is characteristic of carbonate. Intergrown with this are bands of siliceous material.

Polished Section:

After examination of the hand specimen with a hand lens an area of the sample showing most sulphides was selected for preparation of the polished section; however, the polished section contains, in fact, less than 2% of sulphides and these are wholly pyrite. The mineral occurs as isolated crystals and aggregates, none of which is more than 0.3 mm in size. For the most part the pyrite occurs as single crystals about 0.1 mm in size. Most of the pyrite is associated with a central patch of coarse-grained quartz and carbonate. There is no evidence of any association of the pyrite with brecciation or veining, or any other process. In one of the finer-grained parts of the rock the pyrite tends to form rather porous, small patches and it is possible that this material may be in some way secondary rather than being directly deposited. Some of the smaller aggregates of this porous material are rather similar to framboidal pyrite.

3. MINERAL IDENTIFICATIONS

Sample F17M:

The coarse-grained white mineral which obviously forms one side of a fracture system was identified by X-ray diffraction analysis as barite.

Sample F20M:

The dark, metallic mineral was identified by X-ray diffraction analysis as hematite.

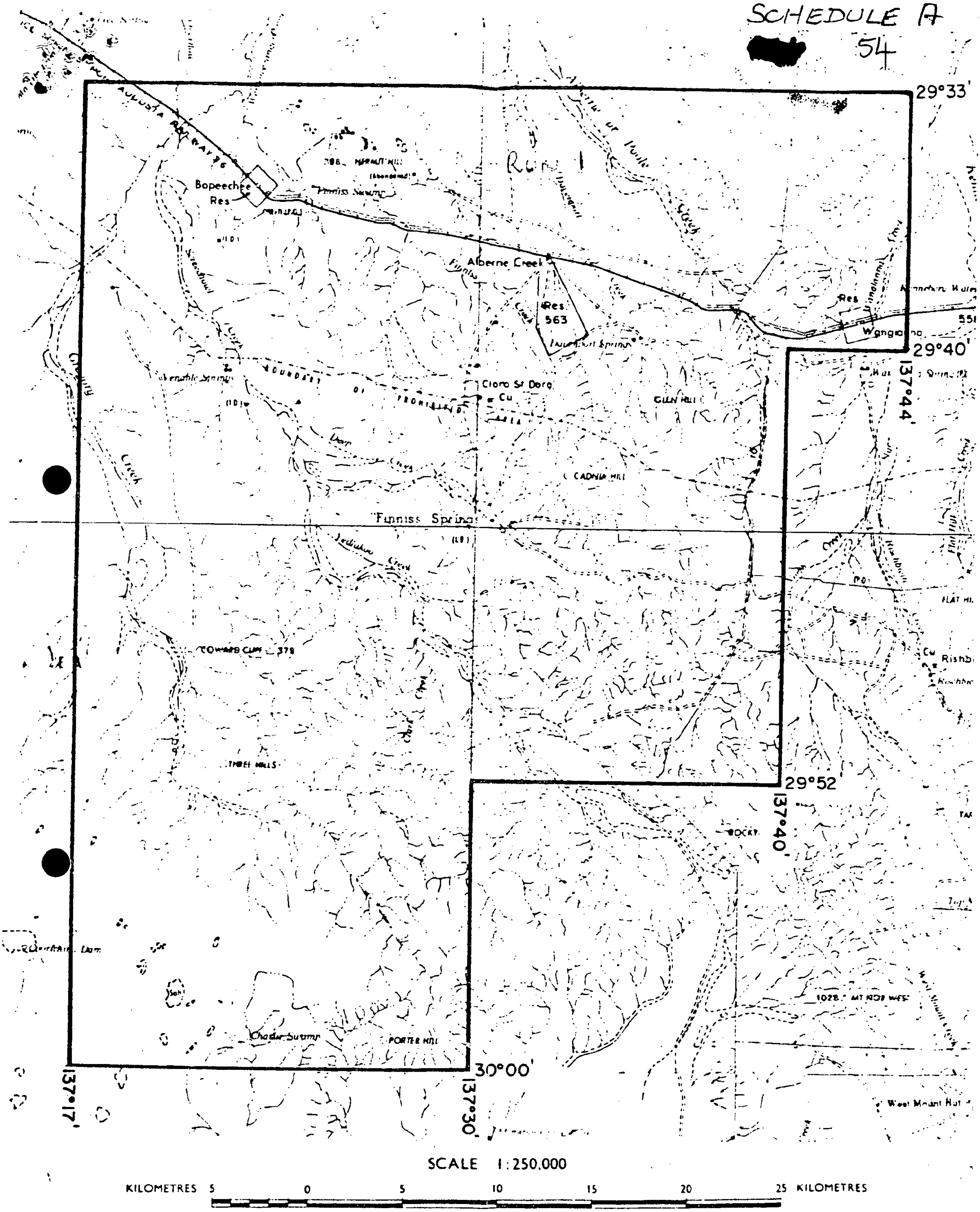
Sample F21M:

This sample consists of three colourless, rounded grains and the Client wished to know whether they consisted of quartz or topaz. Since convenient heavy liquids were available the grains were tested in liquids of densities 2.6 and 2.7 and since the grains have a specific gravity between these two values it is likely that they are quartz.

Sample F22M:

This hand specimen contains surface specks which have a blue and green colour. These were removed from the sample using a dental drill but the X-ray diffraction pattern obtained refers only to quartz and mica. The pattern was searched specifically for diffraction lines which could correlate with malachite and/or azurite but none were seen. This may well be a function of the very small amount of blue and green mineral staining the surface.

SCHEDULE A
[redacted] 54



APPLICANT: CENTRAL COAST EXPLORATION N.L. MAP 1.

DM: 570/79 AREA: 1694 square kilometres

1:250000 PLANS: CURDIMURKA

LOCALITY: FINNISS SPRINGS AREA — APPROX 55 km WEST of MARREE

DATE GRANTED: 28/5/80 DATE EXPIRED: EL No: 634.

[redacted]

CENTRAL COAST EXPLORATION N.L.

PROGRESS REPORT TO 27/11/80

EXPLORATION LICENCE 634

SOUTH AUSTRALIA.

[redacted]

CONTENTS.

[redacted]

SUMMARY.

Central Coast Exploration N.L. was granted an Exploration Licence numbered 634 for one year from the 27th May, 1980.

This report summarises the work completed during the aerial reconnaissance and includes a map showing the full details.

[redacted]

BACKGROUND INFORMATION.

The area lies between $29^{\circ}33'$S and 30°S and $137^{\circ}17'$E and $137^{\circ}44'$E and covers 1694 km^2. (See Map 1)

The climate is semi-arid and consequently there is little vegetation and this is mainly low scrub. The topography is predominantly flat with only a few hills.

Access throughout the area is mainly by station tracks. The Port Augusta - Alice Springs railway track passes through the northern section of the area. Marree is the closest township, approximately 55km east of the area covered be the licence.

Previous work on the licence area has been limited. The Clara St Dora Mine is on the licence and at the turn of the centuzy there was a small scale mine in operation. There is however, no record of production figures from the mine.. The copper ore here occurred in hard limestone in bunches, samll veins and vughs and in soft calcareous rocks.

.....3/...

REGIONAL GEOLOGY.

Most of the lease is covered by Cretaceous rocks. These are marine shales, minor siltstones and sandstones.

About one quarter of the area is covered by Proterzoic rocks which are part of the Adelaide Geosyncline Sequence. The strata represented are from the Burra Group and Sturt Tillite Group.

The rocks in the Burra Group are mainly quartzite, dolomite and siltstone. The group consists of the Myrtle Springs Formation, Skillogalee Dolomite and Witchelina Quartzite - Copley Quartzite. These occupy 1/10 of the total area of the licence and have been strongly folded and contorted which has sometimes led to the formation of breccia. In the same area as these outcrops there is diapiric material.

Some outcrops of Sturt Tillite do occur, however, outcrop in most areas is poor.

There are large areas of Bulldog Shale. This is a grey carbonaceous siltstone and shale with fossiliferous limestone concretions towards the base.

[redacted]

Much of the area is gibber pebbles and boulders. A large proportion of the licence is gypsum with shale and siltstone. The area also has alluvial sediments along most of the creeks.

[redacted]

AERIAL RECONNAISSANCE.

Because of the area covered by the licence it was decided that the best way to do a preliminary study was from the air, landing to take samples in what appeared to be a promising area.

A description of the samples was included in the last quarter's report. A helicopter was hired from Lloyd Helicopters Pty. Ltd., Adelaide, and an aerial survey was carried out using a GIS - 3 Spectrometer.

The map showing the full details of the flight paths and total radiation count per second is included in the Appendix.

The highest values recorded were 40cps in the Hermit Hill area and west of North Creek.

The areas flown over were generally in the areas of Torrensian and Willouran sediments which show a large amount of deformation. The total radiation counts per second varied between 5 and 40 with an average of 25cps.

.....6/...

[redacted]

The largest area of these outcrops in the Cadnia Hill - Davenport Springs region showed no anomalous values. 2 values of 40cps were obtained. The formations here are the Myrtle Springs Formation, Skillogalee Dolomite and Witchelina Quartzite - Copley Quartzite.

In an area about 4 kilometers south of Bopeechee, predominantly Skillogalee Dolomite and Witchelin Quartzite - Copley Quartzite, no outstanding values were obtained. The highest value recorded was 30cps.

The other area concentrated on during the survey, was the Hermit Hill area which also has outcrops of Witchelina Quartzite - Copley Quartzite. This was the same area as the high values of molybdenum, titanium, zircon, arsenic and thallium were recorded in the previous report.

Random flights above the railway track and between the areas of interest were made, however, no outstanding results were obtained.

[redacted]

CONCLUSIONS.

The reconnaissance has not shown any outstanding surface areas of interest, however, this was expected as the type of deposit we are seeking would probably be of the Roxby type.

Further exploration will investigate strata at a depth of 500m to 1000m.

P J O'Rourke

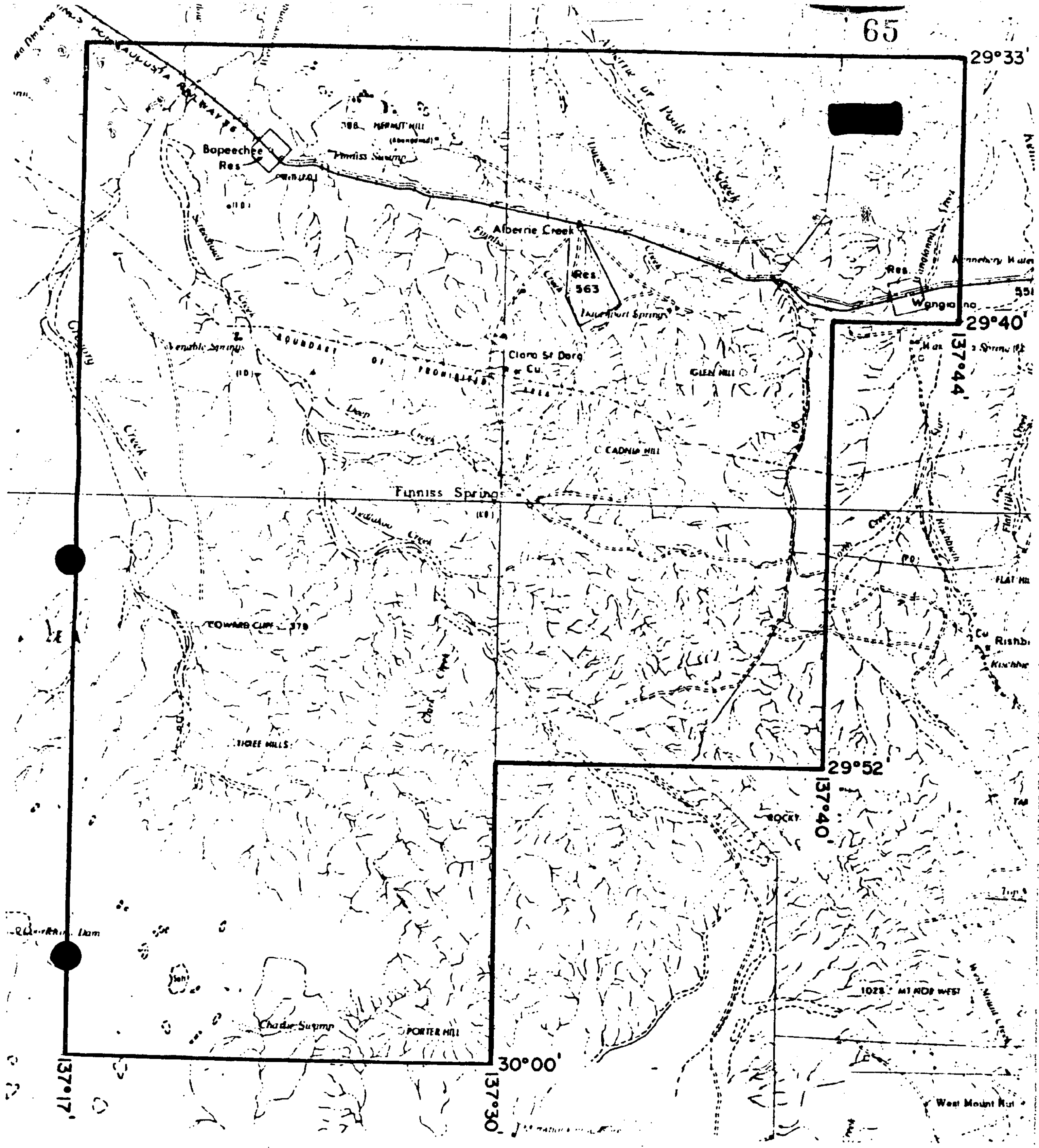
per P.J. O'ROURKE.

Exploration Manager.

APPENDIX (i)

EXPENDITURE.

Drafting and Maps.	250.00
Wages and Salaries.	280.00
	530.00



SCALE 1:250,000

KILOMETRES 5 0 5 10 15 20 25 KILOMETRES

APPLICANT: CENTRAL COAST EXPLORATION N.L.

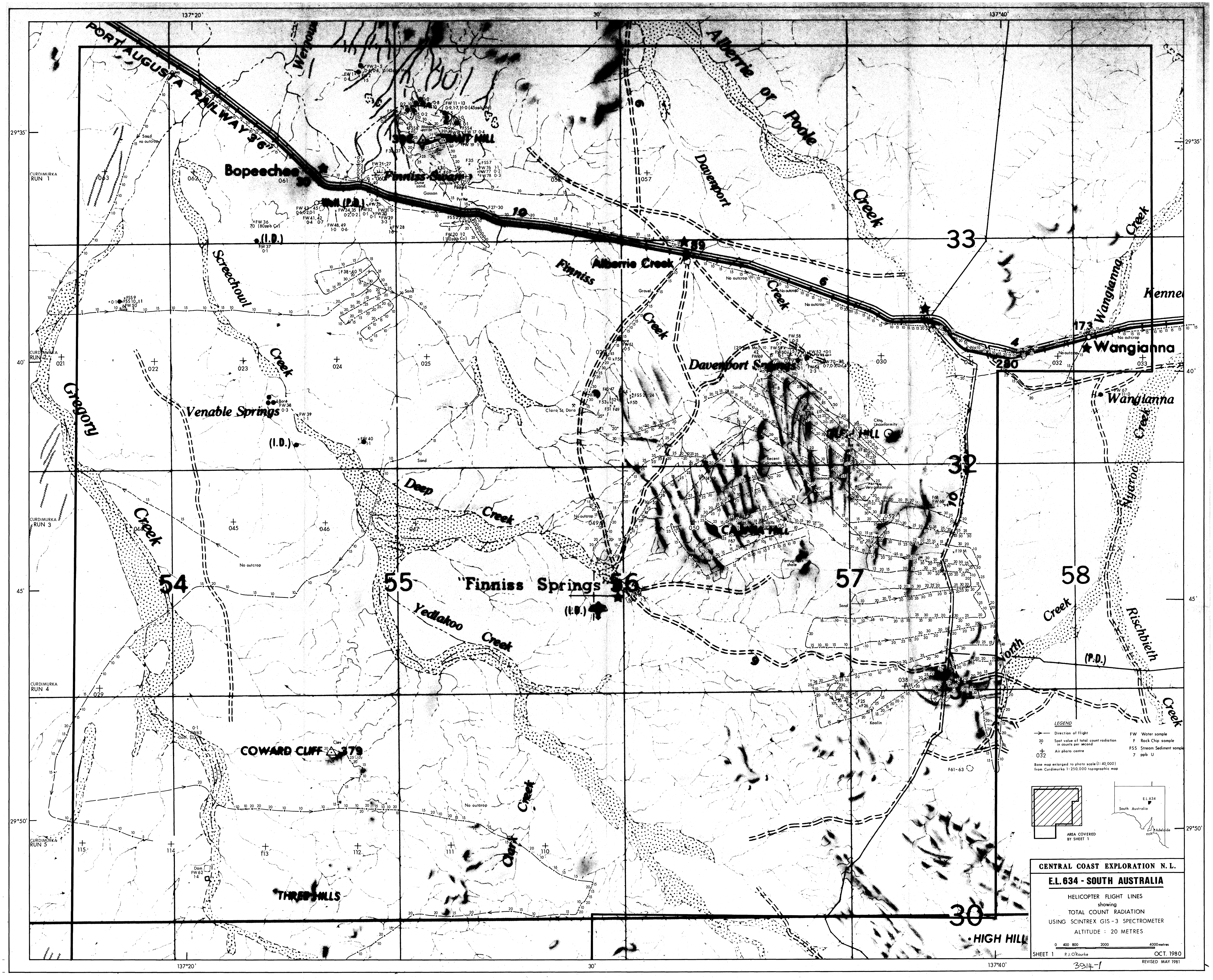
DM: 570/79 AREA: 1694 square kilometres

1:250 000 PLANS: CURDIMURKA

LOCALITY: FINNISS SPRINGS AREA – APPROX 55 km WEST of MARREE

DATE GRANTED: 27-5-1980. DATE EXPIRED: EL No: 634

MAP 1



137°20'
30'
137°40'
29°35'
40'
45'
29°50'
PORT AUGUSTA RAILWAY 3'6"
Bopeechee
Finniss Swamp
Alberrie Creek
Davenport Creek
Poole Creek
Finniss Creek
Screechowl Creek
Davenport Springs
Venable Springs
Gregory Creek
Deep Creek
"Finniss Springs"
Yedlakoo Creek
Wangianna
Wangianna Creek
Nilyaroo Creek
Rischbieth Creek
North Creek
Clark Creek
COWARD CLIFF
THREE HILLS
HIGH HILL
CURDIMURKA RUN 1
CURDIMURKA RUN 2
CURDIMURKA RUN 3
CURDIMURKA RUN 4
CURDIMURKA RUN 5
33
32
30
54
55
56
57
58
LEGEND
Direction of flight
20 Spot value of total count radiation in counts per second
032 Air photo centre
FW Water sample
F Rock Chip sample
FSS Stream Sediment sample
7 ppb U
Base map enlarged to photo scale (1:40,000) from Curdimurka 1:250,000 topographic map
AREA COVERED BY SHEET 1
E.L.634
South Australia
Adelaide
CENTRAL COAST EXPLORATION N.L.
E.L.634 - SOUTH AUSTRALIA
HELICOPTER FLIGHT LINES
showing
TOTAL COUNT RADIATION
USING SCINTREX GIS-3 SPECTROMETER
ALTITUDE : 20 METRES
0 400 800 2000 4000 metres
SHEET 1
P.J. O'Rourke
OCT. 1980
REVISED MAY 1981
3914-1

EL 634

FINNISS SPRINGS AREA

REPORT FOR THREE MONTHS ENDED 27TH FEBRUARY, 1981

Due to the unexpected departure of the project Geologist and inability to replace him at short notice, the planned Field Exploration Programme for January/February was cancelled.

The research programme has, however, continued. A number of unpublished reports were received from the Department of Mines in December and further study was undertaken in Adelaide. Further photographic interpretation has been undertaken based on these studies and on knowledge gained during previous exploration.

An exploration programme is now in hand to include further helicopter traversing, ground sampling and water sampling.

D.M. HEATH.

20th March, 1981

[redacted]

EL 634

EXPENDITURE FOR THREE MONTHS ENDED 27TH FEBRUARY, 1981

Travel & Accommodation	$ 683
Wages & Salaries	1,421
Publications	129
Drafting Services	463
Administration & Overheads	260
	$2,856

[redacted]

CENTRAL COAST EXPLORATION N.L.

REPORT TO 27.5.81

EXPLORATION LICENCE 634

(Finniss Springs)

CONTENTS.

[redacted]

SUMMARY.

Central Coast Exploration N.L. was granted an Exploration Licence numbered 634 for one year from the 27th May, 1980. Due to geologist shortages the exploration programme fell behind schedule. Central Coast Exploration N.L. found it necessary to request that the term of the licence be extended. The Department of Mines and Energy, South Australia has subsequently granted an extension of six months.

[redacted]

BACKGROUND INFORMATION.

The area covered by the licence is centred on Finniss Springs Homestead, located approximately 70km south west of the town of Marree.

Access through the area is mainly by station tracks. The Port Augusta - Alice Springs railway track passes through the northern section of the area.

[redacted]

REGIONAL GEOLOGY.

Much of the area is covered by sediments of the Adelaide Geosyncline. These sediments accumulated 500 to 1000 million years ago on the eastern margin of the Gawler Block. The Gawler Block consists of Proterzoic and Archean Metasediments and foliated granitic and mafic igneous rocks.

During sedimentation in the Adelaide Geosyncline, there were periodic transgressions onto an unstable basement margin, the Stuart Shelf. This led to an equivalent set of sediments to the Adelaide Geosyncline. The shelf is bounded in the east by the Torrens Hinge Zone, a definable margin of the geosyncline and in the west by the limit of the sedimentary deposition. In the north, the boundary is concealed under more recent sedimentary basins.

....4/...

[redacted]

WATER SAMPLING.

During April 1981, a helicopter - borne water sampling programme was carried out. The Exploration Licence area contains numerous springs and seepages and a number of artesian bores.

The aim of the programme was to see if anomalous uranium, copper and other metal values could be detected in the spring or bore waters. Uranium, in particular, is extremely mobile in the oxidised environment. The artesian bores tap water draining through a large cross-section of non-outcropping rocks and anomalous uranium values in the bore water could indicate a uranium source nearby.

The springs and seepages are presumably due to fault structures or fractures tapping aquifers. Some of the springs have strong water flows and are presumably related to fairly major and deep seated faults.

Seventy eight water samples were collected from various areas throughout the Exploration Licence.

....5/...

Uranium Results.

The uranium results varied from less than 0.1 parts per billion (µg/l) up to a maximum of 70ppb in sample number FW 36. The general background level appears to be from 0.2 up to 1.0ppb.

Apart from FW 36 with 70ppb, sample FW 69 with 42 ppb U is also clearly anomalous. Other values of interest are 15ppb in FW 5, 11ppb in FW 13, FW 67 and 7.8ppb in FW 68.

The peak result of 70ppb came from a small pool of water just south west of Bopeechee. The pool was probably due to seepage as the weather had been dry for some time.

Two other results of interest are located in the same general area just to the north of Bopeechee near Hermit Hill. Sample FW 5 contained 15ppb U in a spring just north west of Hermit Hill. Sample FW 13 contained 11ppb U in a slowly running seepage from rock outcrops Hermit Hill.

[redacted]

75

Sample FW 69 taken from Davenport Springs contained 42ppb U. This sample was taken from a slowly running spring seepage.

Copper Results.

The copper content of the 78 water samples varied from less than 2ppb up to a maximum of 110ppb in sample FW 20.

The general background level appears to be from 2 up to 8ppb.

FW 20 was taken from a seepage from a rock face to the south of the railway. Abundant pyrite is evident here and the water sample reflects the probability that some copper mineralisation accompanies the pyrite.

Sample FW 57 with 30ppb Cu and FW 10 with 22ppb, FW 1 with 20ppb are slightly above background.

Zinc Results.

The zinc content of the 78 water samples varied from less than 2 ppb up to a maximum of 40ppb in FW 65. The general background level appears to be from 2 up to 10ppb Zn. The 40ppb level is slightly anomalous.

.... 7/...

Molybdenum Results.

The molybdenum content of the 78 water samples varied from less than 1 up to a maximum of 80ppb in FW 36. The general background level appears to be from 1 up to 2ppb.

The 80ppb result is highly anomalous and interestingly accompanies the highest uranium result of 70ppb.

Other molybdenum water values are clearly anomalous as follows:-

FW 5	has	45ppb Mo	(accompanying	15ppb U)
FW 13	has	45ppb Mo	(accompanying	11ppb U)
FW 69	"	20ppb Mo	("	42ppb U)
FW 68	"	15ppb Mo	("	7.8ppb U)
FW 67	"	15ppb Mo	("	11.0ppb U)
FW 66	"	20ppb Mo	("	2.6ppb U)

There appears to be a close geochemical relationship between the uranium and the molybdenum values in the water samples collected. So much so in the case of FW 36 that one would speculate that the uranium and molybdenum were derived from the same geological area. This in turn tends to enhance the anomalous values in FW 36 as being meaningful in terms of mineralisation.

DISCUSSION OF RESULTS OF WATER SAMPLING.

Some of the water sampling analysis results are clearly anomalous in uranium and molybdenum contents and one has an anomalous copper content. It appears that water sampling is an effective prospecting tool in this area of generally poor outcrops. However, this sampling programme was carried out after a fairly long dry period and the area was noticeably drier than in 1980.

The aim of the survey was to see if water sampling could help provide information from below the obscuring younger sediments of the western side of EL 634.

It certainly appears to do just that and additional water sampling and perhaps some track etch cups could be emplaced in the more interesting areas.

The Hermit Hill area, because of the strong pyrite development and the close proximity if anomalous uranium and molybdenum values appears to be the most interesting.

PJ O'Rourke

P.J.O'Rourke.

Exploration Manager.

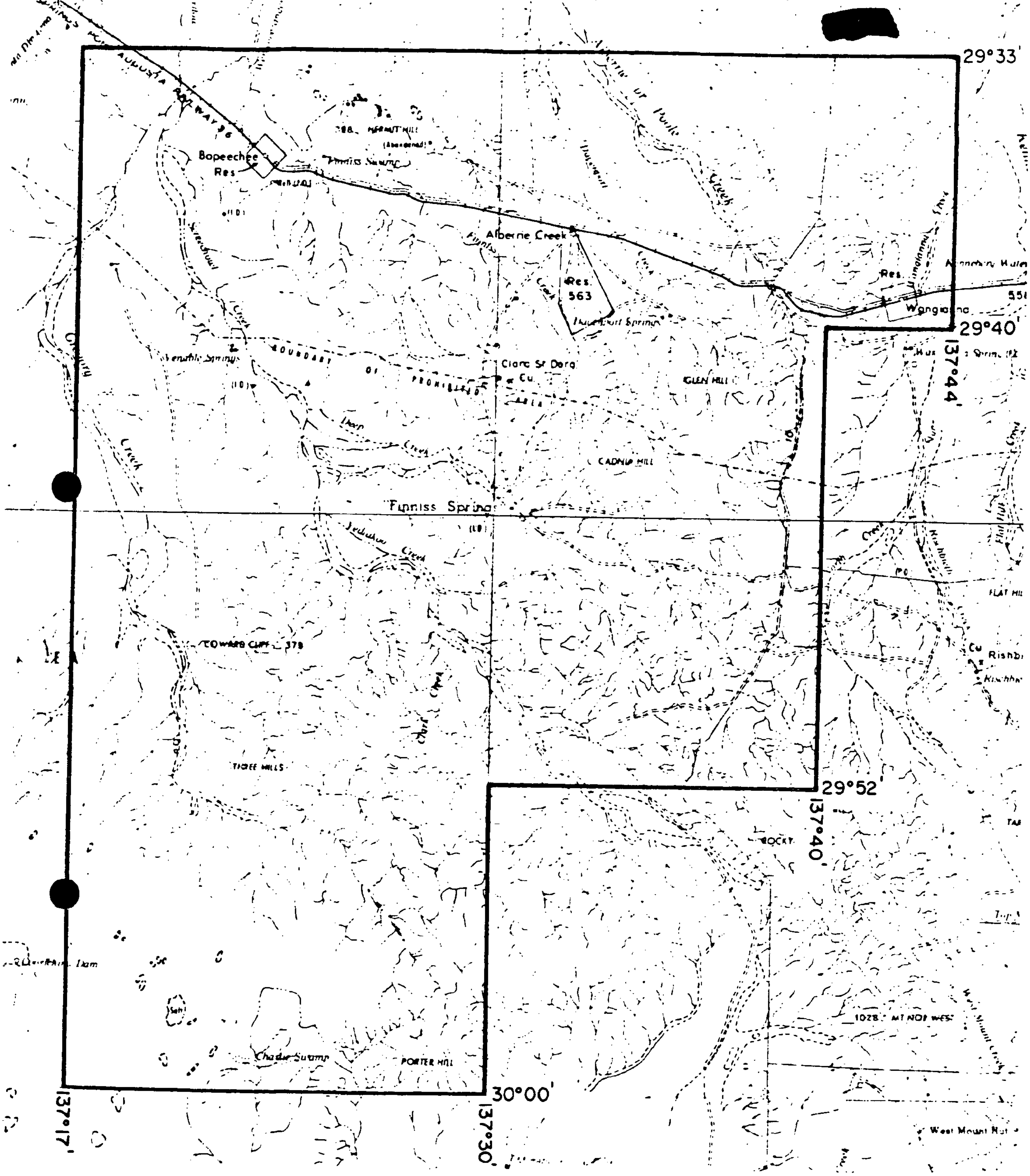
[redacted]

APPENDIX.

Appendix 1	Location Map
Appendix 2	Sample Location Map missing
Appendix 3	Expenditure.

79 SCHEDULE A

[redacted]



SCALE 1:250,000

KILOMETRES 5 0 5 10 15 20 25 KILOMETRES

APPLICANT: CENTRAL COAST EXPLORATION N.L.

DM: 570/79 AREA: 1694 square kilometres

1:250 000 PLANS: CURDIMURKA

LOCALITY: FINNISS SPRINGS AREA — APPROX 55 km WEST of MARREE

DATE GRANTED: 27-5-1980. DATE EXPIRED: EL No: 634

[redacted]

Appendix 3.

Expenditure for the three months to 27.5.81.

Drafting, Maps, Stationery	94.29
Motor Vehicle Expenditure	1437.21
Travel and Freight	1024.72
Accomodation and Food	954.21
Assays and Mineralogy	2533.96
Consumable Stores	198.70
Equipment Hire	224.20
Helicopter Survey	8343.58
Wages and Salaries	2874.00
Overheads and Administration	1768.00
	=========
Total	$19452.87

[redacted]

CENTRAL COAST EXPLORATION N.L.

REPORT FOR EL 634 FOR PERIOD TO 27.8.81

CONTENTS.

[redacted]

[redacted]

1. SUMMARY.

Central Coast Exploration N.L. was granted an exploration licence numbered EL 634 for one year from 27th May, 1980. An extension for 6 months was granted by the Department of Mines and Energy after the exploration programme fell behind schedule due to geologist shortages. A further 6 month extension was applied for and has been granted on the 17th August, 1981.

Subject to the approval of the South Australian Department of Mines and Energy and the Foreign Investment Review Board, Central Coast Exploration has reached agreement with The Shell Company of Australia Limited whereby Shell will joint venture with C.C.E. in further detailed exploration of the exploration licence.

[redacted]

2. BACKGROUND INFORMATION.

The area convered by the licence is centred on Finniss Springs Homestead, located approximately 70 km south west of the town of Marree.

Access through the area is mainly by station tracks. The Port Augusta-Alice Springs railway track passes through the northern section of the area.

3. <u>REGIONAL GEOLOGY</u>.

Much of the area is covered by sediments of the Adelaide Geosyncline. These sediments accumulated 500 to 1,000 million years ago on the eastern margin of the Gawler Block. The Gawler Block consists of Proterozoic and Archean Meatsediments and foliated granitic and mafic igneous rocks.

During sedimentation in the Adelaide Geosyncline there were periodic transgressions onto an unstable basement margin, the Stuart Shelf. This led to an equivalent set of sediments to the Adelaide Geosyncline. The shelf is bounded in the east by the Torrens Hinge Zone, a definable margin of the geosyncline and in the west by the limit of the sedimentary deposition. In the north, the boundary is concealed under more recent sedimentary basins.

....4/...

[redacted]

4. WORK CARRIED OUT TO 27.8.81

In conjunction with the helicopter-borne water sampling programme routine rock chip sampling was carried out. The aim of the sampling was to give additional geochemical information on rocks from various areas. Thirty four samples were taken scattered through various areas being examined. These samples were analysed by the Australian Mineral Development Laboratories in Adelaide for copper, lead, zinc, molybdenum, silver and gold.

Copper.

Values ranged from 4 to 90 ppm. The highest of 90 ppm was encountered in sample F 65, just east of the Finniss Springs Homestead. This was a grab of rubbly outcropping, chloritic, partly silicified, ?tuff with minor ferruginisation in veins and joint surfaces. In the near area there are abundant fragments of milky quartz occurring as "floaters".

The second highest value of 70 ppm Cu was recorded from a very ferruginous, siliceous capping developed on a quartzite sandstone segment. This capping was unusually ferruginous and strongly coloured - purple black. No sulphide remmants were observed and the outcrop is thought to be a false "gossan" resulting from iron enrichment due to prolonged weathering. However, the area of the outcrop is just east of the Clara St. Dora copper mine and some further prospecting may be warranted in this area.

[redacted]

Lead.

Lead values ranged from <5 to 85 ppm. The highest value encountered was 85 ppm in sample numbered F 60 located just north of Porters Hill in the south west part of the Exploration Licence. An outcrop chip sample of weathered claystones with irridescent limonite (replacing pyrite) assayed the 85 ppm.

The second highest value of 55 ppm of similar material also came from this area.

Zinc.

Zinc values ranged from 6 to 190 ppm. Sample F 67 contained the highest value of 190 ppm. This occurred in a selected outcrop sample across approximately 4 metres of very ferruginous sandstone - partly gossanous. The outcrop occurs on Cadnia Hill east of Finnis Springs Homestead. The result is distinctly anomalous and some further prospecting work could be warranted in this area.

Molybdenum.

Values encountered ranged from <1 to 37 ppm. The highest value of 37 ppm was encountered in F 60. Two other samples taken from the same area, F 58 and F 59 also contained 34 ppm and 34 ppm Mo. These values are considered to be highly anomalous warranting considerable further follow up.

The geochemical association indicated by water sampling of uranium and molybdenum

....6/..

may further indicate this area is of some interest.

Sample F 43 with 9 ppm Mo in metasomatised quartzite with pyrite is also weakly anomalous. F 79 in the Hermit Hill area with 9 ppm Mo in partly gossanous sandstone is likewise weakly anomalous.

Silver.

Silver values were not detected above 1 ppm - rather unusual.

Gold.

Gold values ranged from below the limit of detection (<0.02 ppm) to a maximum of 0.06 ppm. The analysis was by Atomic Absorption. Out of thirty four samples, thirteen were greater than the limit of detection but the maximum was only 0.06 ppm. In view of the method used and the low results obtained, no real interpretation of results is possible. However, it does appear there are "real" traces of gold present in the area and future work should be oriented towards confirming this by more careful analysis of rock samples using 100 g Fire Assays.

[redacted]

Four stream sediment samples have been taken from a stream to the east of the Clara St. Dora mine to check whether there is any extension of copper mineralisation. The results are listed below:-

	Cu	Pb	Zn	Mo	in ppm
FSS 21	44	15	34	3	
FSS 22	30	15	30	2	
FSS 23	20	20	40	2	
FSS 24	14	15	34	2	

These results indicate there is no substantial outcrops of copper mineralisation near the Clara St. Dora mine.

Full assay results and field descriptions are included in the appendix.

Information has also been obtained from the Department of Mines and Energy and the Department of Science and the Environment regarding bores, rainfall and evaporation. This data will assist in assessing results previously obtained.

5. DISCUSSION OF RESULTS.

The most interesting results from the limited rock geochemical sampling programme are for molybdenum in the Porters Hill area. From experience gained elsewhere in Australia, the molybdenum values encountered are moderately anomalous and in view of the uranium-molybdenum association indicated by the water sampling the area deserves considerable follow up work.

P.J. O'ROURKE.
Exploration Manager.

6. <u>APPENDICES</u>.

6.1 Expenditure.

6.2 Sample location map. (Transparency previously sent.)

6.3 Assay sheets.

6.1 EXPENDITURE. [redacted]

Freight	90.00
Assays and Mineralogical	1079.76
Travel and Accomodation	312.60
Wages and Salaries	1500.00
Administration	298.24
	=======
Total	3280.57

[redacted]

SURFACE ROCK SAMPLING

PROSPECT : Finnis Springs

LOCATION :

MAIN MINERALS OF INTEREST :

LESSER MINERALS OBSERVED :

TYPE OF SAMPLING — CHIP ☑ CHANNEL ☐ (✓ Where applicable)

SAMPLED BY : D.Heath

DATE : April, 1981

ASSAYS BY : AMDEL

SAMPLE NUMBER	LENGTH SAMPLED	DESCRIPTION	ANALYSES in ppm Cu	Pb	Zn	Ag	Mo		Au.			
F41		Near springs (FW 6 & 7) at Hermit Hill. High broadband count of 80 cps. 60 - 75 cps over 200m^2. Limonitic development on quartzite with slightly decomposed pyrite as vein fillings (false gossan). Limonite developed after pyrite.	4	5	18	<1	4		<0.02			
F 42		Same location 40m to N.E. Limonitic coated concretion in quartzite containing abundant pyrite. Broadband count 82 cps.	4	10	8	<1	1		<0.02			
F 43		Outcrop over 30m^2, disseminated pyrite but abundant in metasomatised quartzite. Partly altered to jarosite. No high background.	8	10	14	<1	9		<0.02			
F44		False gossan, very iron rich siliceous capping developed on quartzite/sandstone sequence. Unusually ferruginous (purple black). Background count 20cps. Maybe weak gossan, though no sulphide remmants.	70	30	20	<1	1		<0.02			

[redacted]

SURFACE ROCK SAMPLING

PROSPECT: Finnis Springs

LOCATION: South Australia.

MAIN MINERALS OF INTEREST:

LESSER MINERALS OBSERVED:

TYPE OF SAMPLING: CHIP ☑ CHANNEL ☐ (✓ Where applicable)

SAMPLED BY: D.Heath

DATE: April, 1981

ASSAYS BY: AMDEL

SAMPLE NUMBER	LENGTH SAMPLED	DESCRIPTION	ANALYSES in ppm									
			Cu	Pb	Zn	Ag	Mo		Au.			
F45		Across strike of outcrop of breccia. Sideritic	6	5	8	<1	1		<0.02			
F46		consisting mainly of quartzite (hard) and sandstone	8	5	12	<1	1		<0.02			
F47		pieces in quartzose (partly ?chloritic) matrix.	6	5	6	<1	1		<0.02			
		Matrix is minor - 20%. Body still retains most of										
		strike of original metasediments.										
F48		Ferruginous (sideritic) breccia. 50 has larger	4	5	8	<1	2		<0.02			
F49		amounts of quartzite enclosed in it. Generally, as	4	5	8	<1	1		<0.02			
F50		for 45 - 47, no minerals evident apart from Fe	6	5	8	<1	<1		<0.02.			
		metasomatism.										
F51		Breccia from hill over shallow gully to south.	4	5	8	<1	<1		<0.02			
		Sample over approx. 2m width. Sideritic with probable										
		sericitic alteration in areas. Breccia mainly in sandstone/quartzite. Bedding destroyed.										

[redacted]

SURFACE ROCK SAMPLING

PROSPECT : Finnis Springs

LOCATION : South Australia.

MAIN MINERALS OF INTEREST :

LESSER MINERALS OBSERVED :

TYPE OF SAMPLING: CHIP ☑ CHANNEL ☐ (✓ Where applicable)

SAMPLED BY : D.Heath

DATE : April, 1981

ASSAYS BY : AMDEL

SAMPLE NUMBER	LENGTH SAMPLED	DESCRIPTION	ANALYSES in ppm						
			Cu	Pb	Zn	Ag	Mo		Au.
F52		Sideritic breccia - developed in predominantly sandstone. Little sericitization and sample over 1.5m along strike.	6	5	8	<1	1		<0.02
F53		Ferruginous brecciated sandstone, minor sericitization Alteration of quartz grains over approx. 3m width. (Min sample)	4	5	4	<1	<1		<0.02
F 54		Ferruginous breccia predominantly quartzite/ sandstone. Sample over 4.5m. (Min Sample)	8	10	12	<1	1		<0.02
F55		Ferruginous breccia. Minor sericitisaion with a few small carbonate vughs. Sample over 3.5m across altered strike. (Min Spec.)	6	10	12	<1	<1		<0.02
F56		Quartzite partially brecciated with some resolution of quartz. Minor alteration. Sample across altered strike over 4m. (Min Spec.)	26	20	10	<1	1		<0.02

[redacted]

SURFACE ROCK SAMPLING

PROSPECT: Finnis Springs.
LOCATION: South Australia.

MAIN MINERALS OF INTEREST:
LESSER MINERALS OBSERVED:
TYPE OF SAMPLING CHIP ☑ CHANNEL ☐ (✓ Where applicable)

SAMPLED BY D.Heath
DATE: April, 1981
ASSAYS BY: AMDEL

SAMPLE NUMBER	LENGTH SAMPLED	DESCRIPTION	ANALYSES in ppm Cu	Pb	Zn	Ag	Mo		Au.
F57		PORTER HILL. Hard, very siliceous sandstone and	6	5	6	<1	1		<0.02
		conglomerate. Slightly ferruginous. Has undergone							
		remobilisation to form hardcap.							
F58 - F60.		1500m north of Porter Hill, area of purple white							
		and red kaolinised clay with thinly bedded altered							
		shales with beautifully irridescent limonite films.							
		(Widespread common opal)							
F58		Selected sample of black-purple shales with	22	55	26	<1	34		<0.02
		irridescent limonite. (Broadband count 60 - 80cps)							
F59		Random grab sample across strike over 5m of shale.	24	40	26	<1	34		<0.02
		(Blue, black, red and cream)							
F60		Sample of shales showing irridescent limonitic and	24	85	24	<1	37		0.02
		red and purple ochrous altered claystones.							
		(Broadband 90cps)							
F61		Sample of ferruginous sandstone (minor alteration)	4	20	14	<1	2		0.06
		with faint gossan. Sample across strike of thin							
		outcrop over approx. 3m.							

SURFACE ROCK SAMPLING

PROSPECT : Finnis Springs.
LOCATION : South Australia.

MAIN MINERALS OF INTEREST :
LESSER MINERALS OBSERVED :
TYPE OF SAMPLING — CHIP ☑ CHANNEL ☐ (✓ Where applicable)

SAMPLED BY D.Heath
DATE April, 1981
ASSAYS BY : AMDEL

SAMPLE NUMBER	LENGTH SAMPLED	DESCRIPTION	Cu	Pb	Zn	Ag	Mo		Au
			ANALYSES in ppm						
F62		Selected sample altered ?quartzite adjacent sample F61. (Min Spec)	4	5	10	<1	1		0·05
F63		Very ferruginous sandstones with haematite traces. Sintered appearance. "False gassan". Grab sample on valley floor.	4	5	12	<1	2		0·04
F64		Partially brecciated sideritic quartzite occurring in a contorted folded sequence at small valley walls. Hard minor incipient sericitisation of more argillaceous beds. Contorted bedding. Sample over 7m across strike.	6	10	10	<1	1		0·03
F65		Chloritic partially silicified ?tuff with minor ferruginisation in veins and joint surfaces. Selected sample from floaters adjacent to large quantity of milky quartz floaters.	90	5	14	<1	<1		0·03

[redacted]

SURFACE ROCK SAMPLING

PROSPECT : Finnis Springs

LOCATION: South Australia.

MAIN MINERALS OF INTEREST:

LESSER MINERALS OBSERVED:

TYPE OF SAMPLING: CHIP ☑ CHANNEL ☐ (✓ Where applicable)

SAMPLED BY D.Heath

DATE: April, 1981

ASSAYS BY: AMDEL

SAMPLE NUMBER	LENGTH SAMPLED	DESCRIPTION	ANALYSES in ppm Cu	Pb	Zn	Ag	Mo		Au			
F66		Channel outcrop sample of several rock types across strike of 8m. Mostly altered quartzite	12	15	16	<1	1		0.03			
F67		Very ferruginous sandstone partially gossanous. Selected sample over approx. 4m across strike.	8	10	190	<1	2		<0.02			
F68		Selected grab sample of quartz mainly white but slightly ferruginous and containing minor pyrite.	4	5	22	<1	1		0.02			
HERMIT HILL AREA.												
F69		Very ferruginous poorly sorted sandstone partly gossanous. Selected sample from small outcrop on hill slope. Occurrence mainly in predominantly quartzite sequence.	12	5	12	<1	9		0.02			
F70		Ferruginous "breccia" probably recemented hardcap (quartzite). Trace of pyrite.	4	5	10	<1	1		0.02			
F71		Weakly ?gossanous sandstone/quartzite sequence. Broadband count 40cps.	6	5	20	<1	5		0.02			

[redacted]

SURFACE ROCK SAMPLING

PROSPECT: Finnis Springs.

LOCATION: South Australia

MAIN MINERALS OF INTEREST:

LESSER MINERALS OBSERVED:

TYPE OF SAMPLING: CHIP ☑ CHANNEL ☐ (✓ Where applicable)

SAMPLED BY: D.Heath

DATE: April, 1981

ASSAYS BY: AMDE:

SAMPLE NUMBER	LENGTH SAMPLED	DESCRIPTION	ANALYSES in ppm										
			Cu	Pb	Zn	Ag	Mo		Au				
AREA OF F2													
F72		Sandstone with partially brecciated areas, some quartz veining. No mineralisation except siderite limonite. Some quartz - soft, crumbling. From outcrop in creek to NNW of main (F46) breccia zone.	30	5	10	<1	1		<0.02				
F73		Close to breccia zone along creek. Quartz vein in sandstone and quartzite. Approx. 1.5m x 0.2m Ferruginous some recementation. Trace of pyrite.	6	<5	6	<1	1		0.04				
F74		Sample of partially brecciated sandstone showing moderate amount of sericitisation. Some calcite veining, moderately ferruginous (?Siderite). Sample across strike over 2m. From small area at least 150m and separate from the main breccia zone (F46)	4	5	6	<1	1		0.03.				

THE SHELL COMPANY OF AUSTRALIA LIMITED

METALS DIVISION

FINNISS SPRINGS E.L. 634

PROGRESS REPORT

FOR QUARTER ENDING 27TH NOVEMBER, 1981

AUTHOR: A. BRASH

REPORT NO.: 08.1120

DATE: DECEMBER, 1981

COPY NO.: 2

DISTRIBUTION:
1 & 2 Central Coast Exploration, N.L.
3 The Shell Company of Australia, Melbourne
4 The Shell Company of Australia,
Metals Division, Adelaide

LIST OF FIGURES

[redacted]

CONTENTS

Page No.

[redacted]

1. INTRODUCTION

Exploration Licence 634, Finniss Springs, is located approximately 55 km east of Maree and covers an area of 1694 square kilometres. (fig. 1)

The Exploration Licence was granted to Central Coast Exploration N.L. for a one year term from the 27th May, 1980. An extension of the term to 24 months was granted on 24th August, 1981.

Since 14th September, 1981, Exploration Licence 634 has been the subject of a joint venture between the Shell Company of Australia Limited and Central Coast Exploration N.L.

2. CONCEPTS

The Finniss Springs E.L. covers the northwest limit of the out-cropping Adelaide Geosyncline. (fig. 2). Oldest rocks belong to the Callana beds which represent the lowest part of the Adelaidean System. These are overlain by rocks of the Burra Group and the lower part of the Umberatana Group in the northeast. The major Northwest Fault strikes through the E.L. forming a graben-like structure between it and the parallel Torrens Hinge Zone to the southwest.

The area is regarded as having potential for:

- stratiform copper within the Callana Beds.
- Olympic Dam type copper-uranium-gold hematite breccia deposits in the pre-Adelaidean basement. In particular an intense gravity anomaly (Bopeechee anomaly - fig. 3) has been recently located adjacent to the major Northwest Fault. This anomaly may have a basement associated source at a relatively shallow depth.

3. EXPLORATION PROGRESS

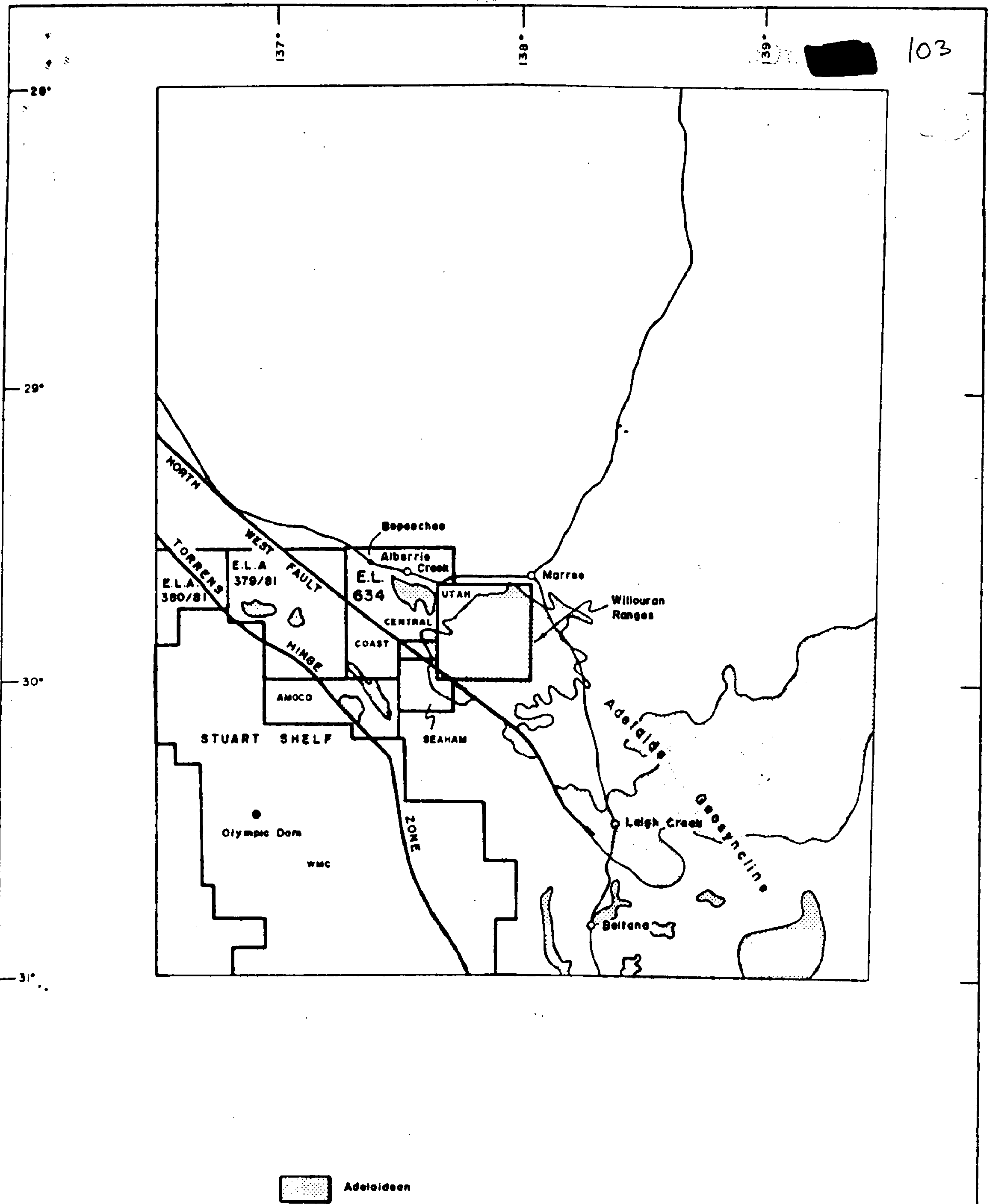
No field work has been carried out in the reporting period.

All available data is currently being reviewed and preparations are in progress for a programme of mapping, gridding, ground magnetic surveying and gravity surveying in the Bopeechee area.

4. KEYWORDS

Adelaide Geosyncline, Gravity surveying.

[redacted] 103



The Shell Company of Australia Limited
METALS DIVISION

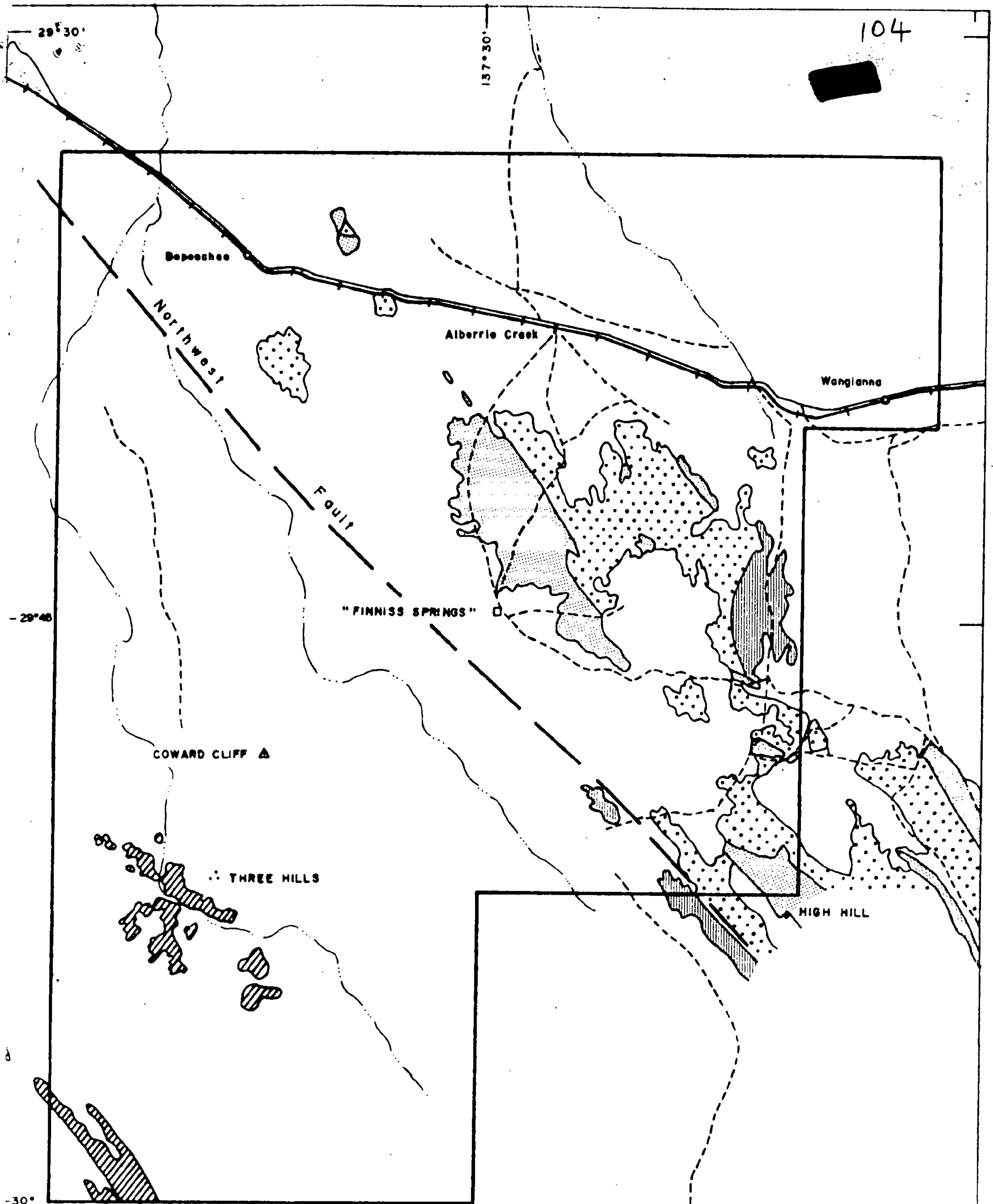
E.L. 634
FINNISS SPRINGS
LOCATION PLAN

Scale 1 2,000,000

FIG. No. 1	REPORT No.
ENCL No.	DRG. No A/MT 22/84
DATE NOV. 1981	AUTHOR A.H.B.
DRAWN B.J.O.	OFFICE ADELAIDE

104

[redacted]



137°45'

Wilpena Group

Umberatana Group

Burra Group

Callana Beds including 'diapiric' material

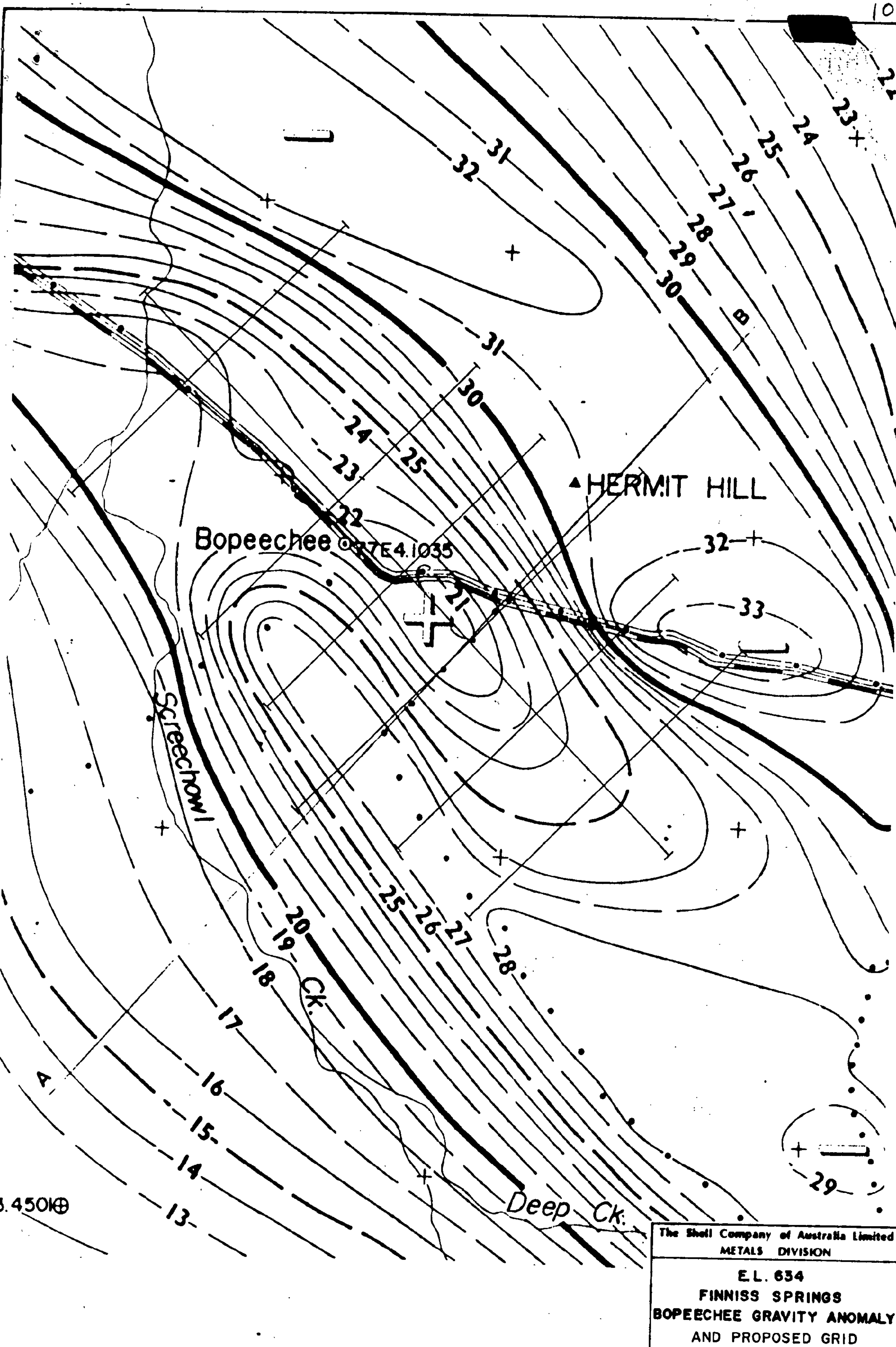
137°30'

The Shell Company of Australia Limited
METALS DIVISION

E.L. 634
FINNISS SPRINGS
GENERALISED GEOLOGY

Scale 1:250,000

FIG. No. 2	REPORT No.
ENCL. No.	FIG. No. A/TD 01/001
DATE NOV. 1981	AUTHOR A.H.B.
DRAWN B.J.O.	OFFICE ADELAIDE



The Shell Company of Australia Limited
METALS DIVISION

E.L. 634
FINNISS SPRINGS
BOPEECHEE GRAVITY ANOMALY
AND PROPOSED GRID
Scale 1 100,000

FIG. No. 3	REPORT No.
ENCL. No.	DRG. No. A/TD 01/003
DATE DEC. 1981	AUTHOR R. J. W.
DRAWN	OFFICE ADELAIDE

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THE SHELL COMPANY OF AUSTRALIA LIMITED

METALS DIVISION

FINNISS SPRINGS E.L. 634

PROGRESS REPORT

FOR QUARTER ENDING 27TH FEBRUARY, 1982

AUTHOR: D.P. BAILEY
REPORT: 08.1123
DATE: FEBRUARY 1982
COPY: 1

DISTRIBUTION: Copy 1& 2 Central Coast Exploration N.L.

3 The Shell Company of Australia Limited
Metals Division, Melbourne

4 The Shell Company of Australia Limited
Metals Division, Adelaide

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1.0 INTRODUCTION

Exploration Licence 634, Finniss Springs, is located approximately 55km east of Maree and covers an area of 1694 square kilometres. (fig. 1)

The Exploration Licence was granted to Central Coast Exploration N.L. for a one year term from the 27th May, 1980. An extension of the term to 24 months was granted on 24th August, 1981.

Since 14th September, 1981, Exploration Licence 634 has been the subject of a joint venture between the Shell Company of Australia Limited and Central Coast Exploration N.L.

2.0 CONCEPTS

The Finniss Springs E.L. covers the northwest limit of the outcropping Adelaide Geosyncline. Oldest rocks belong to the Callana beds which represent the lowest part of the Adelaidean System. These are overlain by rocks of the Burra Group and the lower part of the Umberatana Group in the northeast. The major Northwest Fault strikes through the E.L. forming a graben-like structure between it and the parallel Torrens Hinge Zone to the southwest.

The area is regarded as having potential for:

- stratiform copper within the Callana Beds.
- Olympic Dam type copper-uranium-gold hematite breccia deposits in the pre-Adelaidean basement. In particular an intense gravity anomaly (Bopeechee anomaly - fig. 2) has been recently located adjacent to the major Northwest Fault. This anomaly may have a basement associated source at a relatively shallow depth.

3.0 EXPLORATION PROGRESS

During the period covered by this report, the grid proposed in the previous quarterly report over the Bopeechee Gravity Anomaly has been established. A detailed gravity survey of six parallel grid lines two kilometres apart totalling fifty kilometres, with the station spacing being two-hundred metres, is in progress at the time of writing.

Field reconnaissance mapping was also undertaken in mid-February during which the gridded lines were traversed recording the geomorphology, accessibility and geology. Very little if any of the prospective Adelaidean Callana Beds outcrop within the grid. Generally the outcropping Precambrian rocks are confined to the north-eastern area, around Hermit Hill, and the eastern area just south of where line 12000N crosses the Maree-Oodnadatta Road. Other rocks and geomorphological features present in the area include ?Devonian fossiliferous limestones, Tertiary ferruginous caprock and silcrete and saltpans, indurated sand-dunes, gibber plains and broad flood channels respectively.

Outside of the grid area a short time was spent ground checking the Clare St. Dora Mine which appears to be a limited quartz-malachite (azurite-chalcopyrite) vein breccia system in ?Willouran Callana Beds? One rock chip sample aggregate from this prospect gave 4.50% Cu, 5 ppm Ag, 0.65 ppm Au and 960 ppm As. Pb, Zn, Sn, W, Mo and U were all extremely low; 2, 10,<4,<10, 10 and 4 ppm respectively.

4.0 EXPENDITURE

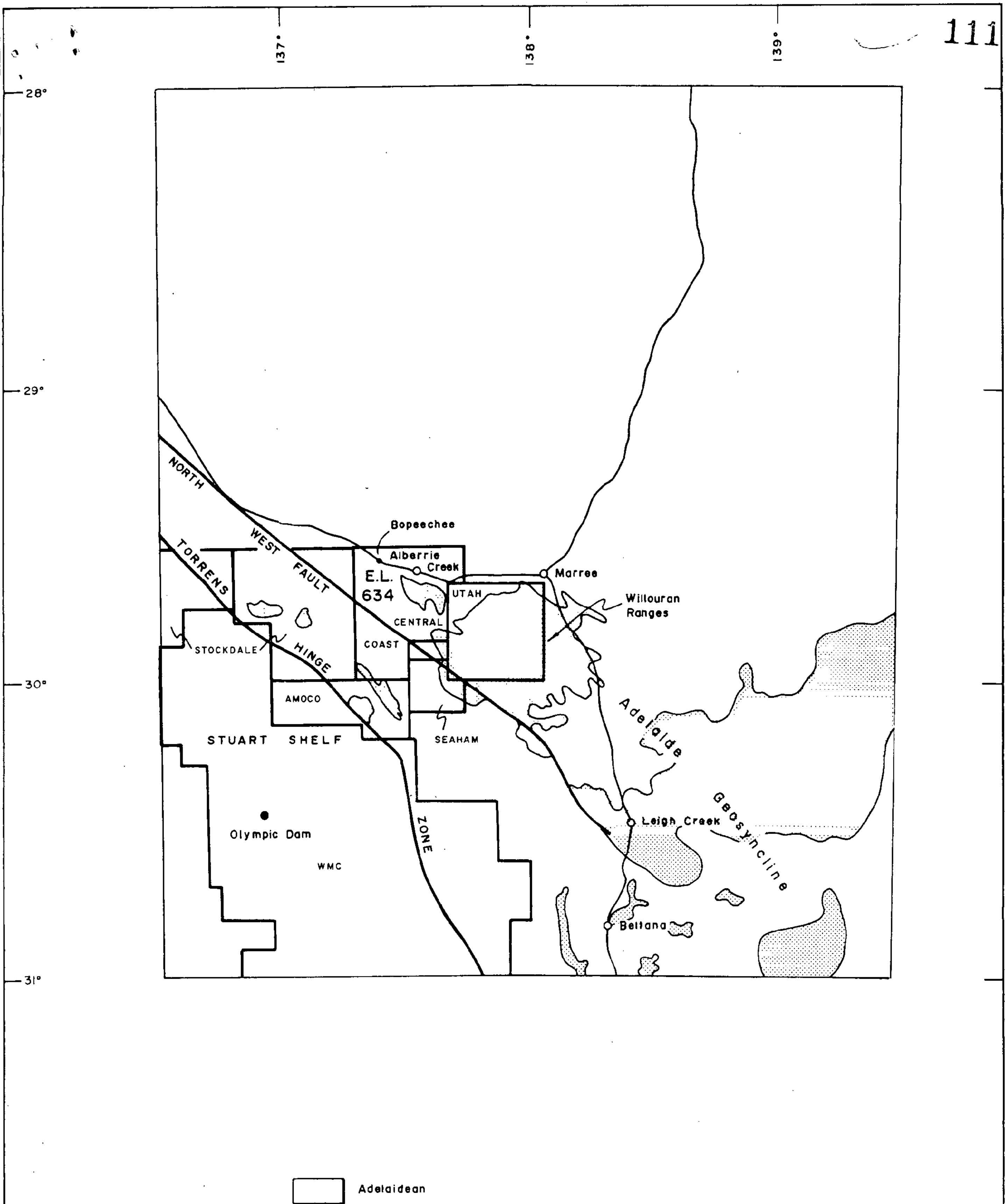
A summary of expenditure is detailed below:

	Actual-Period Ending 31/12/81	Estimated-Period 1/1/82 - 28/2/81	Estimated-Total Project to Date
Personnel/Personnel Burden	730	4,375	5,105
Support Costs	765	500	1,265
Concession Payments	52	0	52
Analysis Assays	0	70	70
Gridding	0	3,583	3,583
Other Costs	250	0	250
General Admin. Services	169	438	607
TOTAL	1,966	8,966	10,932

See next report.

5.0 KEYWORDS

Adelaide Geosyncline, Gravity surveying.

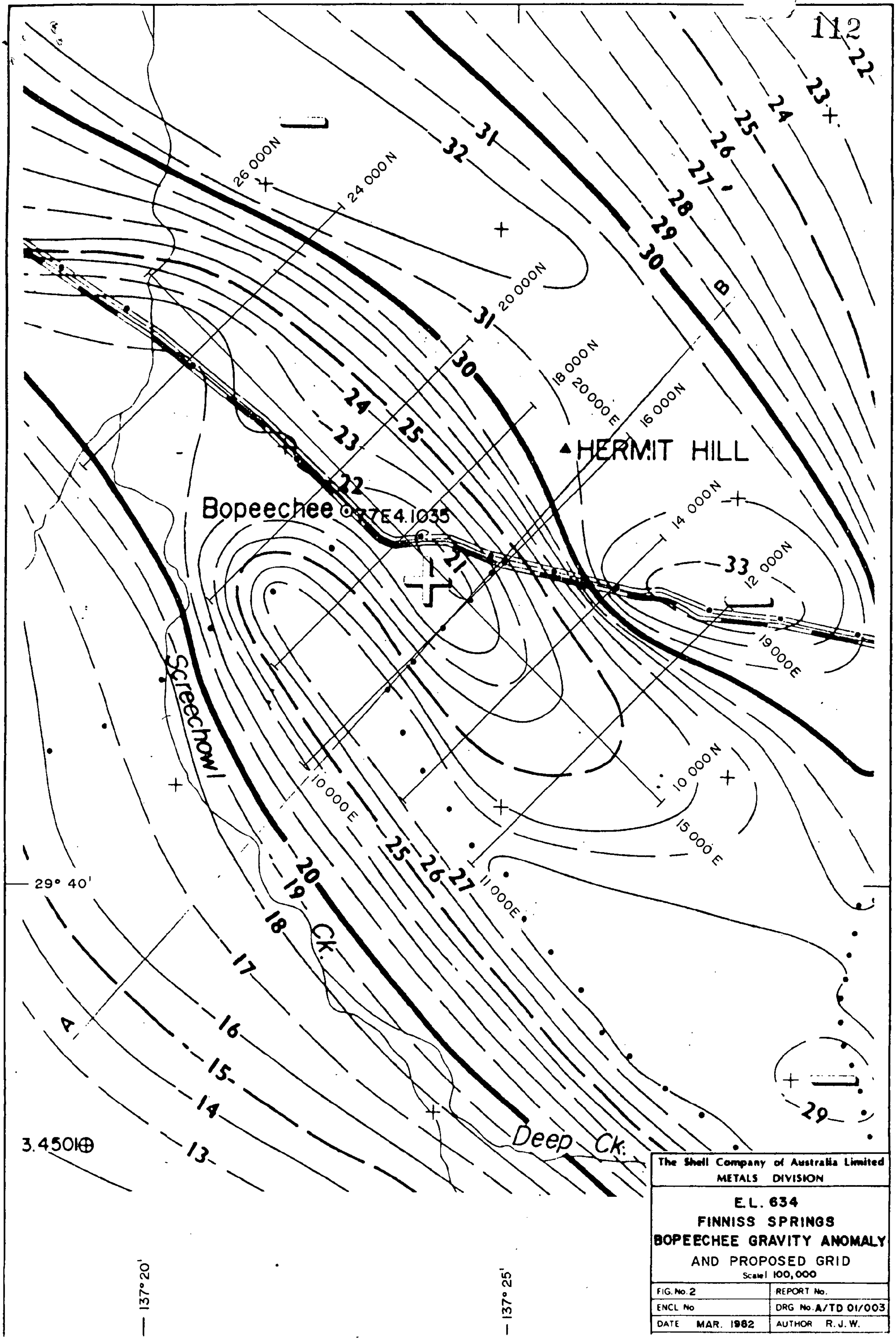


The Shell Company of Australia Limited
METALS DIVISION

E.L. 634
FINNISS SPRINGS
LOCATION PLAN

Scale 1 2,000,000

FIG No. 1	REPORT No
ENCL No	DRG. No A/MT 22/84
DATE MAR. 1982	AUTHOR A.H.B.
DRAWN B.J.O.	OFFICE ADELAIDE



The Shell Company of Australia Limited
METALS DIVISION

E.L. 634
FINNISS SPRINGS
BOPEECHEE GRAVITY ANOMALY
AND PROPOSED GRID
Scale 1 100,000

FIG. No. 2	REPORT No.
ENCL No	DRG No. A/TD 01/003
DATE MAR. 1982	AUTHOR R. J. W.

THE SHELL COMPANY OF AUSTRALIA LIMITED

METALS DIVISION

FINNISS SPRINGS E.L. 634

PROGRESS REPORT

FOR QUARTER ENDING 27TH MAY, 1982

AUTHOR: D.P. BAILEY

REPORT: 08.1200

DATE: MAY 1982

COPY: 1.

DISTRIBUTION: Copy

1 South Australia Department of Mines & Energy

2 Central Coast Exploration N.L.

3 The Shell Company of Australia Limited
Metals Division, Melbourne

4 The Shell Company of Australia Limited
Metals Division, Adelaide

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1.0 INTRODUCTION

Exploration Licence 634, Finniss Springs, is located approximately 55km east of Marree and covers an area of 1694 square kilometres.(Fig.1)

The Exploration Licence was granted to Central Coast Exploration N.L. for a one year term from the 27th May, 1980. An extension of the term to 24 months was granted on 24th August, 1981.

Since 14th September, 1981, Exploration Licence 634 has been the subject of a joint venture between the Shell Company of Australia Limited and Central Coast Exploration N.L.

As E.L.634 - Finniss Springs - is due for renewal on 27.5.82, a request for renewal has been made via Central Coast Exploration N.L. to SADME for a further year's tenure.

2.0 CONCEPTS

The Finniss Springs E.L. covers the northwest limit of the outcropping Adelaide Geosyncline. Oldest rocks belong to the Callanna beds which represent the lowest part of the Adelaidean System. These are overlain by rocks of the Burra Group and the lower part of the Umberatana Group in the northeast. The major Northwest Fault strikes through the E.L. forming a graben-like structure between it and the parallel Torrens Hinge Zone to the southwest.

The area is regarded as having potential for:

- stratiform copper within the Callanna Beds.
- Olympic Dam type copper-uranium-gold hematite breccia deposits around the Adelaidean/pre-Adelaidean basement contact. In particular an intense gravity anomaly at Bopeechee (Fig.2) has been surveyed and modelled, and appears to have a basement associated source at a relatively shallow depth.

3.0 EXPLORATION PROGRESS

During the three month period covered by this report, the logistics report on the gravity survey conducted by Geoterrex, in February-March of this year, was received. An edited version of this report is included as Appendix I.

Ongoing gravity modelling of the "Bopeechee Gravity Anomaly" using Olympic Dam parameters has produced a close fit to the raw data resulting in the strong possibility that the source is much closer to the surface than originally expected. The modelling phase however is still current and the parameters will be refined as more geological constraints are imposed. An assessment of the modelling programme will be appended to the proceeding Quarterly Report, due on 27.8.82.

The source of the anomaly is as yet undefined, therefore the outcropping Adelaidean rocks within the Exploration Licence are to be mapped during the next three months with stratigraphic positioning and structural interpretation to be attempted.

No field work has been undertaken during the preceding three months.

4.0 KEYWORDS

Adelaidean, Gravity.

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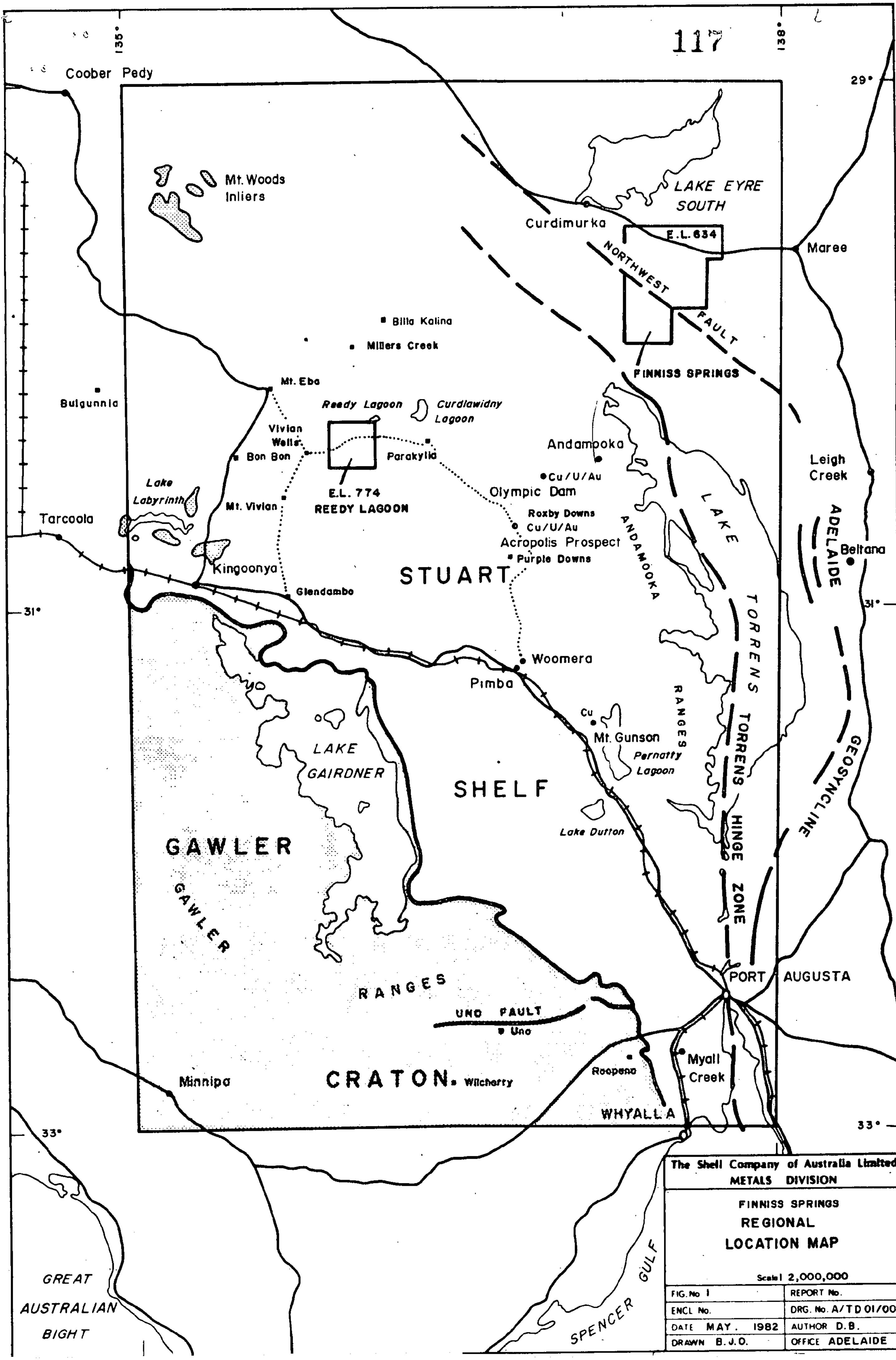
5.0 EXPENDITURE

A summary of expenditure is detailed below:

	Actual Jan/Mar	Actual Apr/May	Total Project to Date
Personnel/Personnel Burden/Support	5 072	1 310	7 877
Concession Payments	0	70	122
Analysis Assays	70	0	70
Geophysical Surveys	0	10 215	10 215
Gridding	3 802	0	4 052
Other Costs	405	0	574
TOTAL	9 349	11 595	22 910

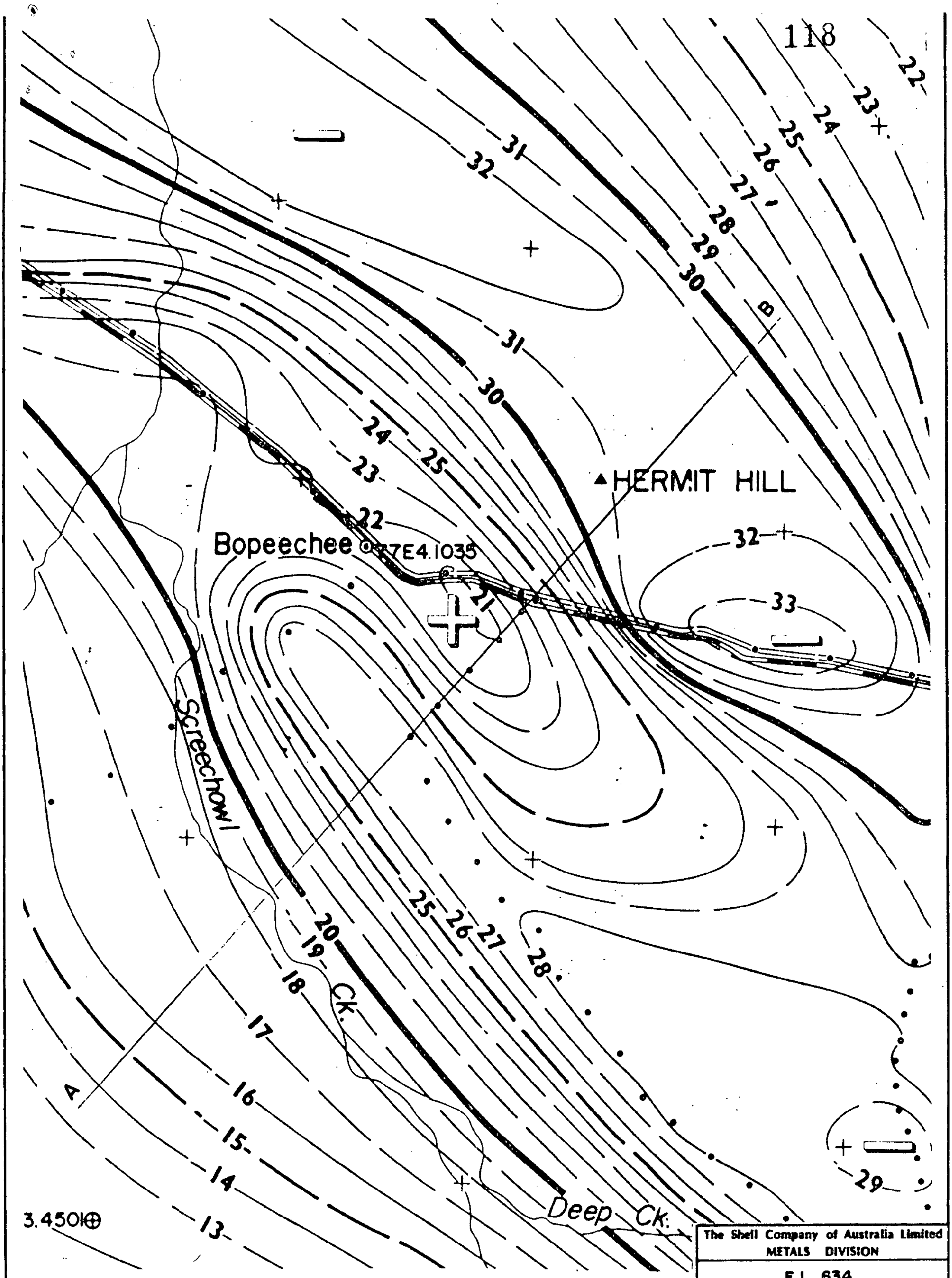


The Shell Company of Australia Limited
METALS DIVISION

FINNISS SPRINGS
REGIONAL
LOCATION MAP

Scale 1 2,000,000

FIG. No 1	REPORT No.
ENCL No.	DRG. No. A/TD 01/006
DATE MAY. 1982	AUTHOR D.B.
DRAWN B.J.O.	OFFICE ADELAIDE



The Shell Company of Australia Limited
METALS DIVISION

E.L. 634
FINNISS SPRINGS
BOPEECHEE GRAVITY ANOMALY

Scale 1:100,000

FIG. No. 2	REPORT No.
ENCL. No	DRG No A/TD 01/002
DATE MAY 1982	AUTHOR A.H.B.
DRAWN	OFFICE ADELAIDE

APPENDIX 1

A LOGISTICS REPORT

ON THE

FINNISS SPRINGS GRAVITY SURVEY

CONDUCTED BY

GEOTERREX PTY LTD

on behalf of

SHELL AUSTRALIA PTY LTD
(METALS DIVISION)

Job No. 85-1398
Geoterrex Pty Ltd.,
224 Charles Street,
North Perth, W.A. 6006

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Not needed.

I. INTRODUCTION

From the 9th February 1982 to 4th March 1982 Geoterrex Pty Ltd carried out a regional gravity survey in Bopeechee area of South Australia on behalf of Shell Metals.

This survey was conducted to further define an anomalous zone of interest shown by gravity surveys conducted by the South Australian Mines Department.

The area is generally flat and access is easily obtained by way of the Marree - Oodnadatta road which passes through the survey area.

II. PERSONNEL

The Geoterrex field crew consisted of:

S. Wardlaw - Field Geophysicist

S. Dixon - Operator

III. EQUIPMENT

Geoterrex Pty Ltd supplied the following equipment:

- LaCoste & Romberg Gravity Meter G586

- Four wheel drive vehicle

- Self sufficient camp for the Geoterrex personnel

- All spares and peripheral equipment

IV. SURVEY PROCEDURE

Shell Metals pegged the lines to be surveyed by gravity and levelled before the Geoterrex crew arrived on site.

Station 77E4.1035 surveyed and permanently marked by the South Australian Government Mines Department was chosen as the datum point for the survey so that all levels and gravity values were tied to the previous Government surveys.

Levelling was carried out using a Wild Automatic level and reading closed loops, as shown in Appendix D.

V. DATA REDUCTION

The field data was reduced in the field for preliminary plots and for monitoring the survey so that poor readings could be redone and extensions added as required.

The data was reduced by the application of the following corrections:

(1) Tidal Correction

This correction is applied to take account of the 'time variant effect' celestial masses have on the geometric shape of the earth. Computer calculated corrections are available from the Bureau of Mineral Resources in Canberra.

(2) Instrument Drift Correction

This correction takes account of the drift which is inherent in the meter itself and is typically of the order of thousandths of a milligal per minute (Less than 1 milligal per month)

(3) Latitude Correction

Because the earth is not a truly spherical body, and is actually 'triaxial spheroidal' in nature due to the axial rotation, the gravitational force varies with latitude and a correction must be made to take this effect into account. This correction is plus 0.812 sin 2 0 milligals per kilometre north of an arbitrary datum point. 0 is the survey latitude.

(4) Elevation Correction

This correction is a combined "Free Air"/"Bouguer" correction and corrects the observed reading for variation in the gravitational force between different stations. The free air correction corrects the observed reading for variations in gravitational force due to the station's distance from the centre of the earth whilst the Bouguer correction corrects the observed reading for the variations in the gravitational force due to the density of the material lying between the datum plane and the station level.

The corrected gravity values will show variations in the gravitational field of the earth caused by variations in the density of the crust; these values are known as "Bouguer Values"

These corrections may be presented in the formula:-

$$G_B = g_{obs} + g_0 + (.3086 - 0.04185 \times d)\, h + C$$

where:

G_B = Reduced gravity value

g_{obs} = Observed gravity value (corrected reading - instrument drift and tidal corrections applied)

g_0 = Latitude correction

h = Station elevation (m)

d = Bouguer density ($gm\ cm^{-3}$)

C = Constant (to adjust the data to an arbitrarily chosen or designated datum level)

VI. ACCURACY OF THE GRAVITY SURVEY

The error in the Bouguer gravity will be a combination of the errors involved in each of the corrections applied as the Bouguer gravity is the result of the expression:

$$G = g + c.h + g_o$$

where:

g = observed gravity (corrected for tidal and meter drift)

c = free air Bouguer correction ≃ 0.2mgal/metre

h = station elevation

g_o = latitude correction

The total accumulated error is the Bouguer gravity e_G and is the result of the expression:

$$e_G^2 = eg^2 + (c.e_h)^2 + e_{g_o}^2$$

eg is < +/- .04 mgal (.034 mgal by analysis of repeated stations (see figure Appendix)

e_h is < .20 metres (see appendix for loop closure diagram)

e_{g_o} is of the order of +/- 0.01 milligals (e_{g_o} will be equal to the N - S positional error for any station times the latitude correction factor. 0.01 milligals is used because it is believed that almost all stations will be positioned to better than +/- 10 m of their intended position)

Therefore: $e_G^2 = (0.04)^2 + (.04)^2 + (.01)^2$

$= .0016 + .0016 + .0001$

$= .0033$

and $e_G = +/- .06$

VIII. DATA PRESENTATION

The data was reduced in the field to Bouguer gravity values, assuming a density of $1.9gcm^{-3}$ and plotted in profile form, a horizontal scale of 1:25,000 was utilised. The profiles are appended to this report.

VIII. CONCLUSION

During the course of this survey 275 gravity stations were established with 23 repeats being taken. Statistical analysis of the data shwos an accuracy of +/- .06 mgal was achieved for the repeat data.

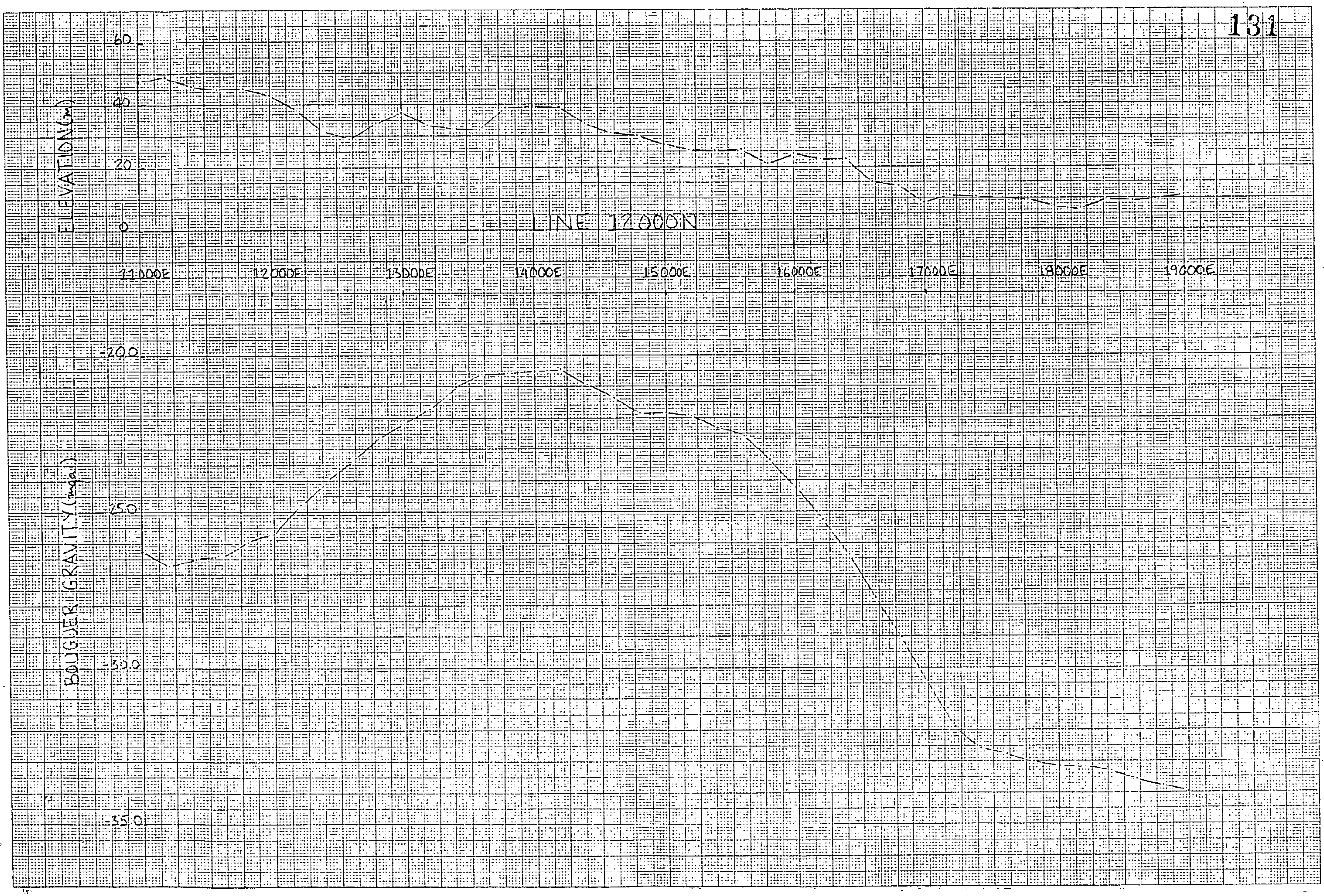
It is reasonable to expect that this is a representative selection of data and that this value is representative of the survey data as a whole.

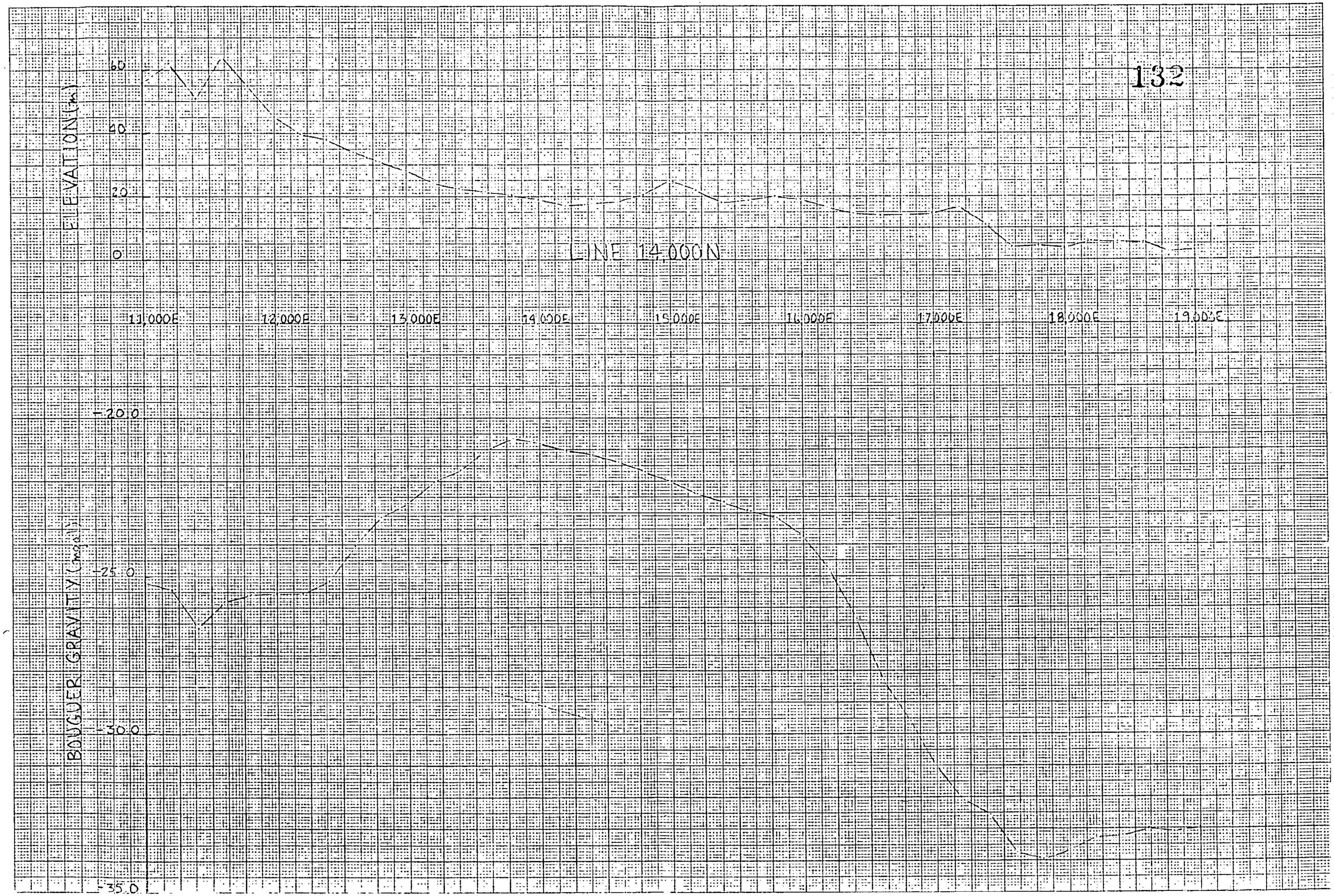
Respectfully submitted,

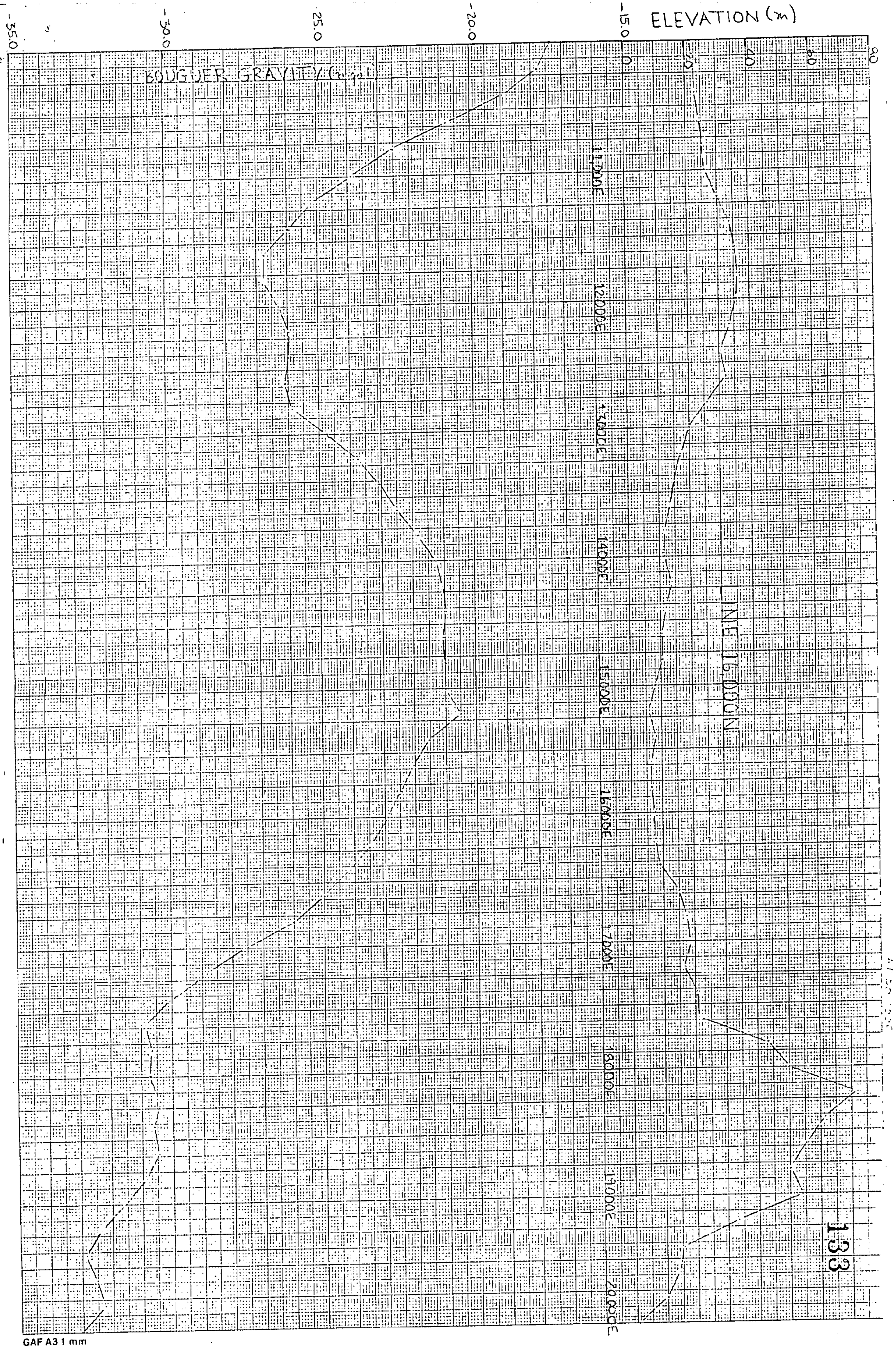
K. E. Le Brocq

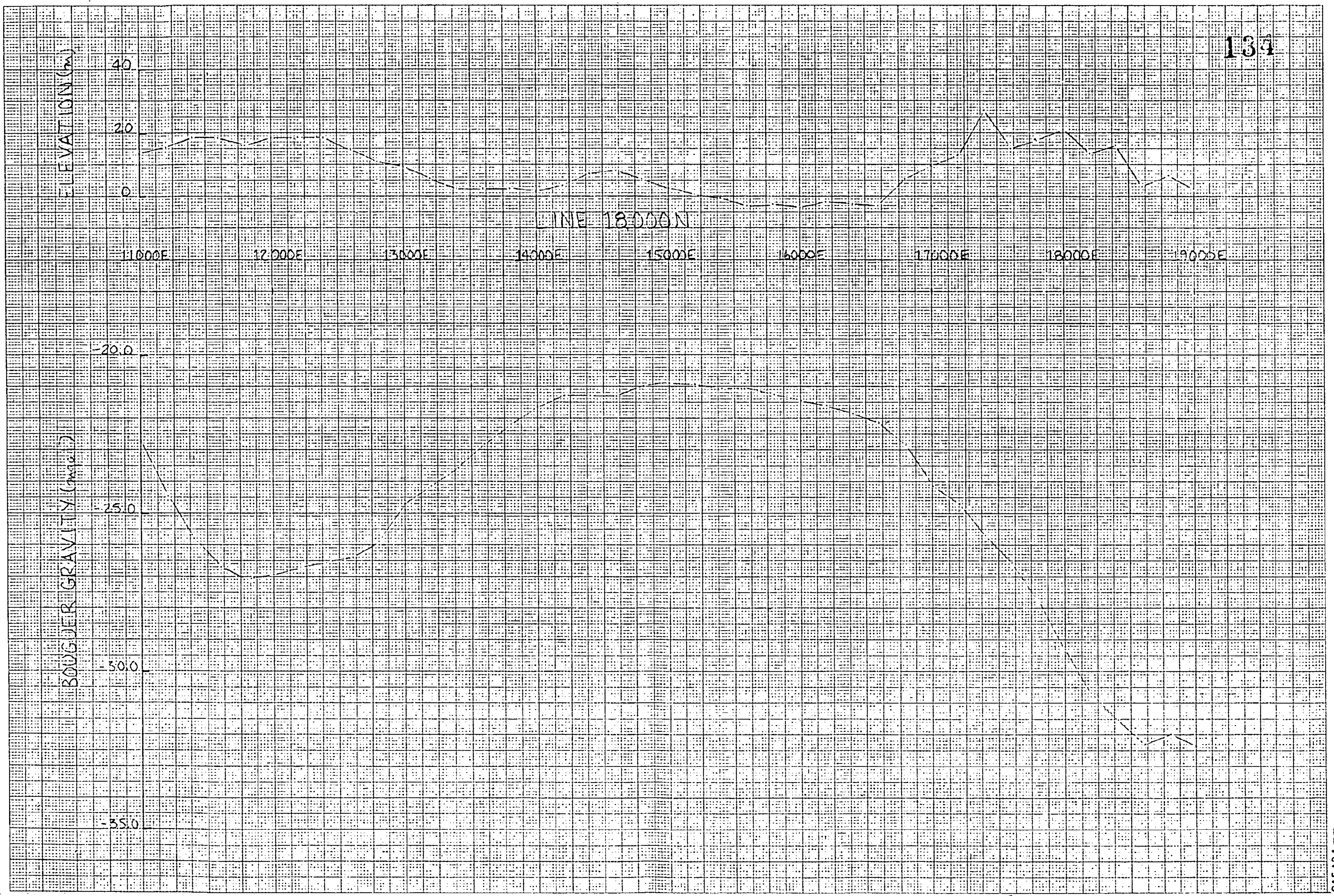
APPENDIX A

BOUGUER PROFILES

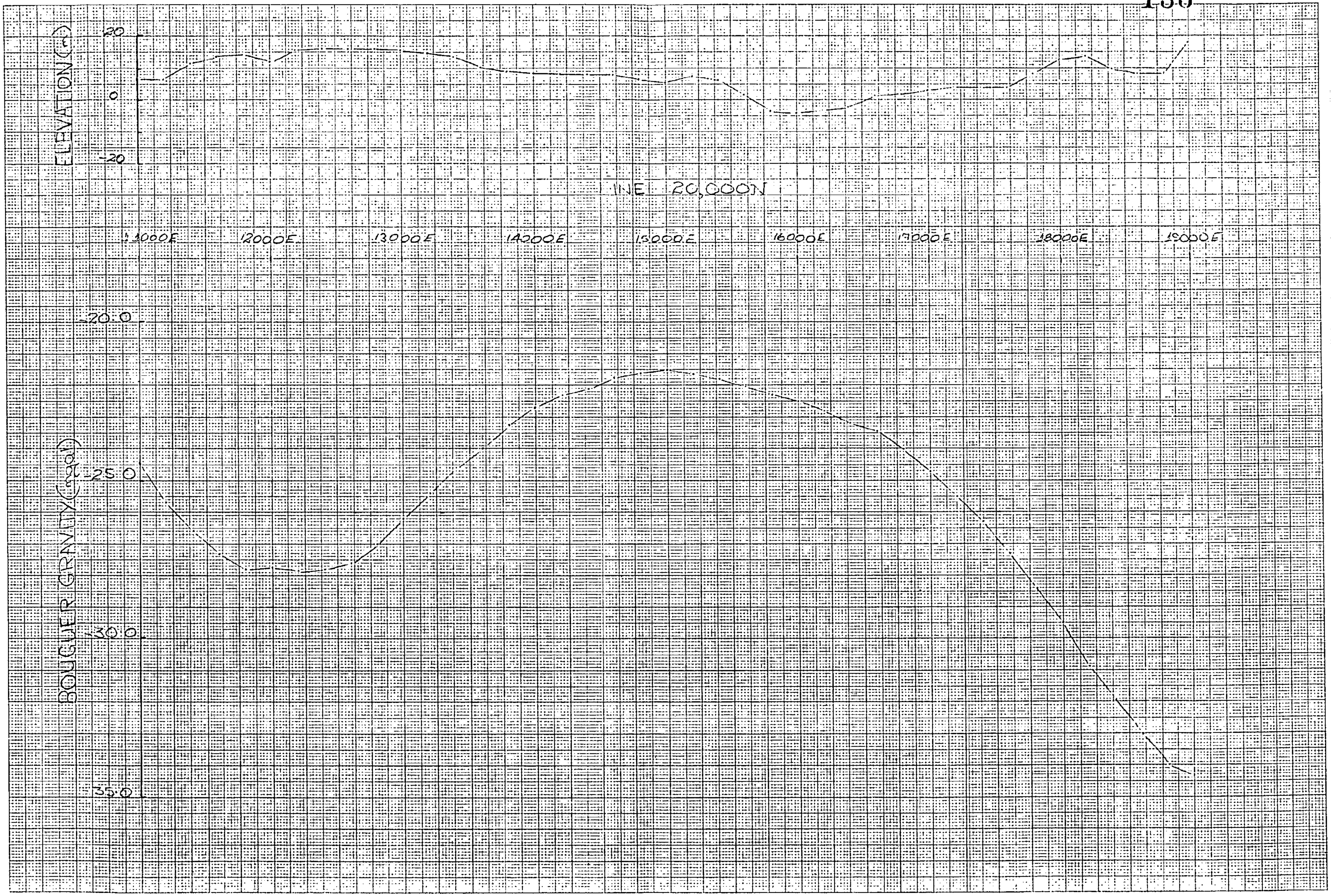

ELEVATION(m)
60
40
20
0
LINE 12000N
11000E
12000E
13000E
14000E
15000E
16000E
17000E
18000E
19000E
BOUGUER GRAVITY (mgal)
-20.0
-25.0
-30.0
-35.0

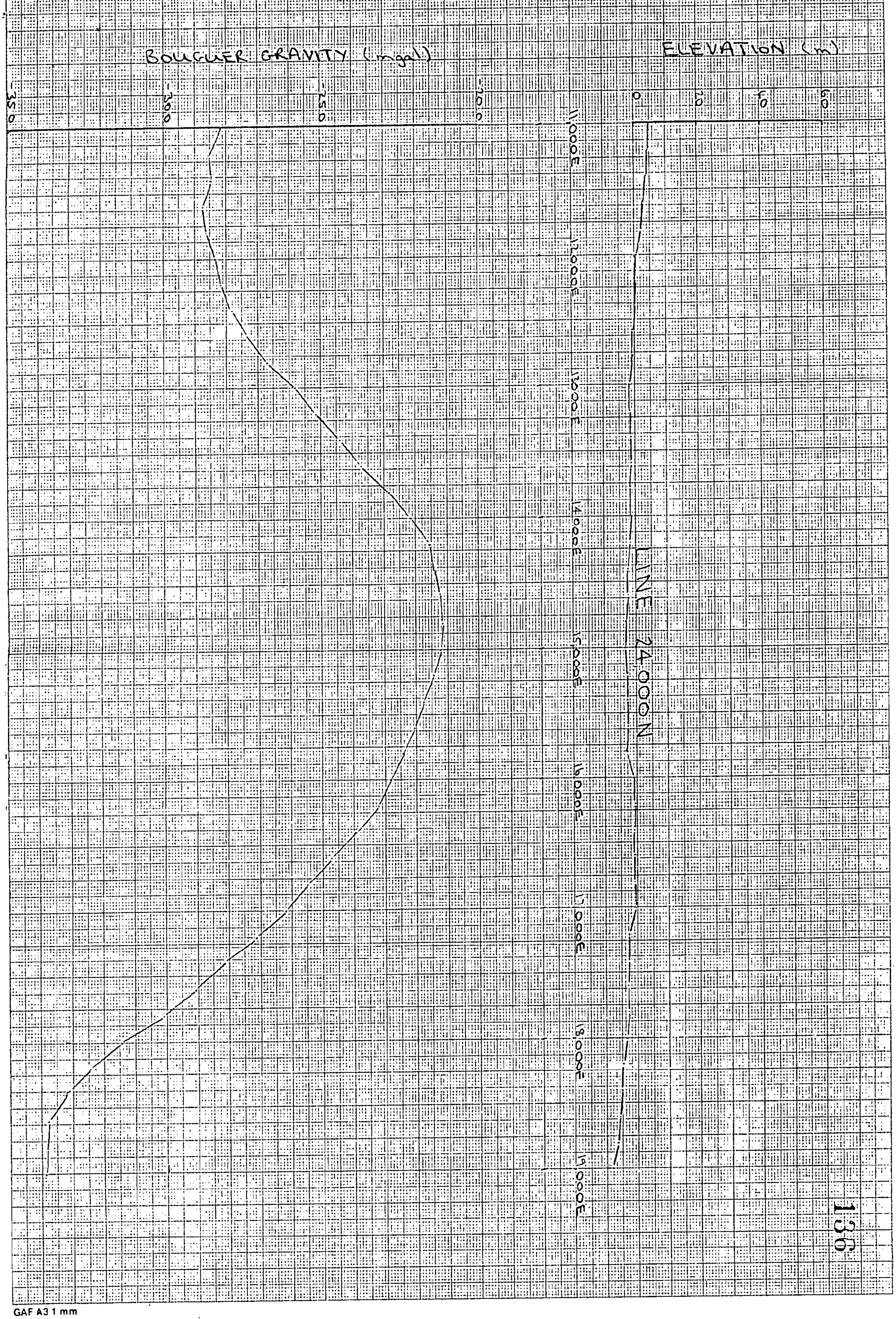

132
ELEVATION (m)
60
40
20
0
LINE 14,000N
11,000E
12,000E
13,000E
14,000E
15,000E
16,000E
17,000E
18,000E
19,000E
BOUGUER GRAVITY (mgal)
-20.0
-25.0
-30.0
-35.0


ELEVATION (m)
BOUGUER GRAVITY (g.u.)
-35.0
-30.0
-25.0
-20.0
-15.0
0
20
40
60
80
11000E
12000E
13000E
14000E
15000E
16000E
17000E
18000E
19000E
20000E
LINE 16,000N
GAF A3 1 mm


ELEVATION (m)
40
20
0
LINE 18000N
11000E
12000E
13000E
14000E
15000E
16000E
17000E
18000E
19000E
BOUGUER GRAVITY (mgal)
-20.0
-25.0
-30.0
-35.0

GAF A3 1 mm


ELEVATION (m)
20
0
-20
LINE 20,000N
11000E
12000E
13000E
14200E
15000E
16000E
17000E
18000E
19000E
BOUGUER GRAVITY (mgal)
-20.0
-25.0
-30.0
-35.0


BOUGUER GRAVITY (mgal)
ELEVATION (m)
-35.0
-30.0
-25.0
-20.0
0
20
40
60
11000E
12000E
13000E
14000E
15000E
16000E
17000E
18000E
19000E
LINE 24000N
GAF A3 1 mm

APPENDIX B

FIELD DATA SHEETS

GEOTERREX GRAVITY DATA SHEET

(1)

JOB No 85-1398 AREA BOPEEKHEE DATE 240282 OPERATOR SD METER CONST 1.02755 (1.02763) LATITUDE 29.5948 METER G586

	SURVEY (~~LINE~~)	STATN	G. OBSERVED	INIT RDG	FINAL RDG	INIT TIME	FINAL TIME	ELEVATION	TIDAL INIT	TIDAL FINAL	N.S.B.
GRAVITY BASE	77E4	1035	979282.42	2809.07	2808.79	0950	1420	9.40	−0.058	+0.161	6.30
BAROMETRIC BASE			−21.70 BOUGUER GRAV (d=1.9 g/cm³)								
BAROMETRIC FIELD											

LINE (E)	STATN (N)	RDG	TIME	TIDAL	NSB	FIELD BAROM RDG	FIELD BAROM DRY	FIELD BAROM WET	BASE BAROM RDG	BASE BAROM DRY	BASE BAROM WET	ELEVATION AHD	ELEVATION OPTIC	ELEVATION BAROM	BOUGUER ANOMALY P_1 1.9 g/cm³	P_2	P_3	REMARKS
19000	24000	2796.68	10.21	−.033	12.90								−7.962		−33.84			DRIFT = −.06 mgal/270
18800	24000	2796.46	1027	−.028	12.66								−6.397		−33.80			x 1.027594 minutes
18600	24000	2796.49	1040	−.016	12.52								−5.822		−33.72			= −.06 mgal/270 min
18400	24000	2796.92	1045	−.012	12.38								−5.042		−33.19			
18200	24000	2797.66	1050	−.007	12.24								−4.683		−32.44			
18000	24000	2798.42	1054	−.003	12.10								−3.382		−31.45			
17800	24000	2799.69	10.57	−.001	11.96								−2.736		−30.09			
17600	24000	2800.86	1102	.004	11.82								−3.022		−29.05			
17400	24000	2801.80	1106	.008	11.68								−2.919		−28.15			
17200	24000	2802.85	1110	.012	11.54								−2.767		−27.13			
17000	24000	2803.37	1114	.017	11.40								−0.564		−26.18			
16800	24000	2804.18	1117	.020	11.26								−0.857		−25.51			
16600	24000	2804.98	1122	.025	11.12								−0.579		−24.72			
16400	24000	2805.83	1125	.028	10.98								+0.527		−23.93			
16200	24000	2806.56	1129	.032	10.84								+0.307		−23.22			
16000	24000	2807.10	1134	.038	10.70								+0.572		−22.81			
15800	24000	2808.11	1139	.043	10.56								−3.027		−22.43			
15600	24000	2808.46	1144	.048	10.42								−2.581		−22.06			
15400	24000	2808.95	1148	.052	10.28								−3.077		−21.76			
15200	24000	2809.32	1153	.058	10.14								−2.907		−21.43			
15000	24000	2809.70	1207	.072	10.00								−3.832		−21.22			

CONTINUED / WEST

(2).

GEOTERREX GRAVITY DATA SHEET

JOB No 85-1398 AREA BOPEECHEE DATE 4/02/82 OPERATOR SD METER CONST 1·02755 (1·02763) LATITUDE 29·5948 METER G586

	LINE	STATN	G. OBSERVED	INIT RDG	FINAL RDG	INIT TIME	FINAL TIME	ELEVATION	TIDAL INIT	TIDAL FINAL	N.S.B.
GRAVITY BASE											
BAROMETRIC BASE											
BAROMETRIC FIELD											

LINE (E)	STATN (N)	RDG	TIME	TIDAL	NSB	FIELD BAROM RDG	FIELD BAROM DRY	FIELD BAROM WET	BASE BAROM RDG	BASE BAROM DRY	BASE BAROM WET	ELEVATION AHD	ELEVATION OPTIC	ELEVATION BAROM	BOUGUER ANOMALY P 1.9	BOUGUER ANOMALY P 2	BOUGUER ANOMALY P 3	REMARKS
14800	24000	2809·80	1214	·078	9.86								-3·127		-21·16			
14600	24000	2809·67	1223	·087	9.72								-2·511		-21·24			
14400	24000	2809·65	1228	·092	9.58								-2·456		-21·34			
14200	24000	2809·32	1233	·096	9.44								-1·516		-21·55			
14000	24000	2808·75	1242	·105	9.30								-1·141		-22·14			
13800	24000	2808·18	1246	·109	9.16								-1·276		-22·85			
13600	24000	2807·36	1252	·114	9.02								-1·105		-23·74			
13400	24000	2806·84	1256	·118	8·88								-1·231		-24·40			
13200	24000	2806·24	1302	·123	8·74								-1·426		-25·15			
13000	24000	2805·68	1306	·126	8.60								-1·481		-25·83			
12800	24000	2804·73	1310	·128	8·46								-0·552		-26·69			
12600	24000	2804·25	1314	·131	8.32								-0·759		-27·33			
12400	24000	2803·68	1318	·133	8·18								-0·006		-27·83			
12200	24000	2803·39	1323	·136	8·04								0·406		-28·13			
12000	24000	2803·22	1328	·139	7·90								0·728		-28·32			
11800	24000	2802·64	1332	·142	7·76								2·371		-28·64			
11600	24000	2802·58	1335	·144	7·62								2·671		-28·73			
11400	24000	2802·65	1338	·145	7·48								3·831		-28·48			
11200	24000	2802·61	1342	·148	7·34								4·076		-28·56			
11000	24000	2803·01	1346	·150	7·20								4·326		-28·19			

(3)

GEOTERREX GRAVITY DATA SHEET

JOB No 85-1398 AREA BOPEECHEE DATE 240282 OPERATOR SD METER CONST 1.02763 LATITUDE 29.5948 METER 586

	LINE (SURVEY)	STATN	G. OBSERVED	INIT RDG	FINAL RDG	INIT TIME	FINAL TIME	ELEVATION	TIDAL INIT	TIDAL FINAL	N.S.B.
GRAVITY BASE	77EA	1035	979282.42	2808.79	2808.86	1420	1629	9.40	+0.161	+0.119	6.30
BAROMETRIC BASE											
BAROMETRIC FIELD											

LINE (E)	STATN (N)	RDG	TIME	TIDAL	NSB	FIELD BAROM RDG	FIELD BAROM DRY	FIELD BAROM WET	BASE BAROM RDG	BASE BAROM DRY	BASE BAROM WET	ELEVATION AHD	ELEVATION OPTIC	ELEVATION BAROM	BOUGUER ANOMALY P_1	BOUGUER ANOMALY P_2	BOUGUER ANOMALY P_3	REMARKS
11000	20000	2808.10	1502	0.165	4.343								6.444		-24.45			
11200	20000	2806.79	1508	0.163	4.483								6.514		-25.69			
11400	20000	2804.66	1513	0.161	4.623								11.625		-26.61			
11600	20000	2803.40	1518	0.159	4.763								13.784		-27.32			
11800	20000	2802.71	1524	0.157	4.903								14.314		-27.81			
12000	20000	2803.19	1528	0.155	5.043								11.972		-27.76			
12200	20000	2802.12	1533	0.153	5.183								15.947		-27.85			
12400	20000	2802.03	1536	0.152	5.323								16.167		-27.80			
12600	20000	2802.19	1540	0.151	5.463								16.007		-27.57			
12800	20000	2802.63	1544	0.149	5.603								16.147		-27.00			
13000	20000	2803.42	1548	0.148	5.743								15.727		-26.18			
13200	20000	2804.34	1551	0.146	5.883								14.752		-25.37			
13400	20000	2805.24	1554	0.145	6.023								13.772		-24.57			
13600	20000	2806.42	1558	0.144	6.163								10.742		-23.96			
13800	20000	2807.39	1601	0.142	6.303								9.067		-23.24			
14000	20000	2808.03	1605	0.139	6.443								8.380		-22.66			
14200	20000	2808.33	1605	0.136	6.583								8.290		-22.27			
14400	20000	2808.46	1611	0.134	6.723								8.145		-22.08			
14600	20000	2808.75	1614	0.132	6.863								7.805		-21.76			
14800	20000	2809.09	1615	0.128	7.003								6.535		-21.61			
15000	20000	2809.31	1622	0.125	7.143								5.560		-21.52			

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GEOTERREX GRAVITY DATA SHEET

JOB No 85-1398 AREA BOPEECHEE DATE 240282 OPERATOR SD METER CONST 1.02763 LATITUDE 29.5948 METER G586

	SURVEY ~~LINE~~	STATN	G. OBSERVED	INIT RDG	FINAL RDG	INIT TIME	FINAL TIME	ELEVATION	TIDAL INIT	TIDAL FINAL	N.S.B.
GRAVITY BASE	77E4	1035	979282.42	2808.86	2809.03	1629	1935	9.40			6.30
BAROMETRIC BASE											
BAROMETRIC FIELD											

LINE (E)	STATN (N)	RDG	TIME	TIDAL	NSB	FIELD BAROM RDG	FIELD BAROM DRY	FIELD BAROM WET	BASE BAROM RDG	BASE BAROM DRY	BASE BAROM WET	ELEVATION AHD	ELEVATION OPTIC	ELEVATION BAROM	BOUGUER ANOMALY P_1	BOUGUER ANOMALY P_2	BOUGUER ANOMALY P_3	REMARKS
15200	20000	2808.68	1644	0.107	7.283								7.470		-21.65			
15400	20000	2808.70	1648	0.104	7.423								6.160		-21.83			
15600	20000	2809.39	1652	0.101	7.563								1.803		-22.03			
15800	20000	2810.18	1655	0.098	7.703								-3.530		-22.34			
16000	20000	2810.07	1658	0.096	7.843								-4.133		-22.50			
16200	20000	2809.47	1704	0.090	7.983								-3.113		-22.79			
16400	20000	2808.78	1710	0.084	8.123								-2.233		-23.21			
16600	20000	2807.64	1713	0.081	8.263								1.382		-23.45			
16800	20000	2806.89	1718	0.075	8.403								1.912		-24.01			
17000	20000	2805.86	1722	0.071	8.543								3.131		-24.70			
17200	20000	2804.83	1727	0.066	8.683								3.977		-25.47			
17400	20000	2803.96	1731	0.062	8.823								3.852		-26.30			
17600	20000	2802.88	1735	0.056	8.963								3.770		-27.33			
17800	20000	2800.77	1740	0.053	9.103								5.138		-28.41			
18000	20000	2798.61	1745	0.048	9.243								12.619		-29.51			
18200	20000	2796.90	1750	0.042	9.383								13.907		-30.88			
18400	20000	2796.71	1755	0.037	9.523								9.710		-31.94			
18600	20000	2795.90	1800	0.032	9.663								6.218		-33.03			
18800	20000	2794.78	1805	0.027	9.803								5.533		-34.01			
19000	20000	2792.21	1810	0.022	9.943								18.194		-34.35			
15000	20000	2809.45	1832	0.000	7.143								5.560					RPT

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GEOTERREX GRAVITY DATA SHEET

JOB No 85-1398 AREA BOPEECHEE DATE 240282 OPERATOR SD METER CONST 1.02763 LATITUDE 29.5948 METER G586

	SURVEY ~~LINE~~	STATN	G. OBSERVED	INIT RDG	FINAL RDG	INIT TIME	FINAL TIME	ELEVATION	TIDAL INIT	TIDAL FINAL	N.S.B.
GRAVITY BASE	77E4	1035	979282.42	2808.42	2809.03	1629	1935	9.40	+0.119	-0.055	630
BAROMETRIC BASE											
BAROMETRIC FIELD											

LINE (E)	STATN (N)	RDG	TIME	TIDAL	NSB	FIELD BAROM RDG	FIELD BAROM DRY	FIELD BAROM WET	BASE BAROM RDG	BASE BAROM DRY	BASE BAROM WET	ELEVATION AHD	ELEVATION OPTIC	ELEVATION BAROM	BOUGUER ANOMALY p_1	BOUGUER ANOMALY p_2	BOUGUER ANOMALY p_3	REMARKS
15000	20500	2809.42	1841	-0.009	7.500								3 648		-21.73			
15000	21000	2809.21	1846	-0.014	7.857								2 650		-21.93			
15000	21500	2809.37	1852	-0.020	8.214								0.570		-22.00			
15000	22000	2809.22	1856	-0.024	8.571								0 555		-21.91			
15000	22500	2809.44	1900	-0.028	8.929								0 043		-21.56			
15000	23000	2809.72	1904	-0.031	9.286								0 095		-21.01			
15000	23500	2810.18	1909	-0.035	9.643								-2.903		-20.98			
15000	24000	2809.92	1918	-0.042	10.000								-3.332					RPT

GEOTERREX GRAVITY DATA SHEET

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JOB No 85-1398 AREA BOPEECHEE DATE 250282 OPERATOR SD METER CONST 1.02763 LATITUDE 29.5948 METER G586

	~~LINE~~ SURVEY	STATN	G. OBSERVED	INIT RDG	FINAL RDG	INIT TIME	FINAL TIME	ELEVATION	TIDAL INIT	TIDAL FINAL	N.S.B.
GRAVITY BASE	77E4	1035	979282.42	2809.02	2808.75	938	+24HRS 1502	9.40	-0.084	+0.126	6.30
BAROMETRIC BASE											
BAROMETRIC FIELD											

LINE (E)	STATN (N)	RDG	TIME	TIDAL	NSB	FIELD BAROM			BASE BAROM			ELEVATION			BOUGUER ANOMALY			REMARKS
						RDG	DRY	WET	RDG	DRY	WET	AHD	OPTIC	BAROM	P 1	P 2	P 3	
15000	20000	2809.47	9.48	-.081	7.143								5.560					
15000	19500	2810.52	9.55	-.079	6.786								2.503		-21.39			
15000	19000	2810.42	10.00	-.077	6.429								4.760		-21.22			
15000	15500	2811.49	10.05	-.073	6.071								1.850		-21.03			
15000	18000	2811.73	10.13	-.068	5.714								2.351		-20.91			
15200	18000	2811.98	10.20	-.063	5.854								0.584		-20.96			
15400	18000	2812.18	10.26	-.058	5.994								-0.416		-21.04			
15600	18000	2812.43	10.32	-.054	6.134								-2.796		-21.07			
15800	18000	2812.02	10.35	-.052	6.274								-2.541		-21.27			
16000	18000	2812.02	10.40	-.048	6.414								-3.545		-21.46			
16200	18000	2811.38	10.45	-.045	6.554								-1.807		-21.62			
16400	18000	2811.20	10.50	-.041	6.694								-2.425		-21.84			
16600	18000	2810.92	10.54	-.038	6.834								-2.950		-22.15			
16800	18000	2808.30	10.58	-.035	6.974								5.299		-22.35			
17000	18000	2806.00	11.04	-.030	7.114								9.520		-24.15			
17200	18000	2804.59	11.08	-.026	7.254								12.930		-24.71			
17400	18000	2800.34	11.13	-.022	7.394								27.178		-25.71			
17600	18000	2802.15	11.28	-.007	7.534								14.964		-26.54			
17800	18000	2800.30	11.33	-.003	7.674								17.632		-27.73			
18000	18000	2797.91	11.37	.001	7.814								21.024		-29.30			
18200	18000	2798.18	11.50	.013	7.954								13.531		-30.63			
18400	18000	2796.66	11.58	.021	8.094								15.943		-31.54			
18600	18000	2798.70	12.16	.039	8.234								2.950		-32.20			
18800	18000	2798.16	-12.22	.045	8.374								6.271		-31.99			

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GEOTERREX GRAVITY DATA SHEET

JOB No 85-1398 AREA BOPEECHEE DATE 250282 OPERATOR SD METER CONST 1.02763 LATITUDE 29.5948 METER G586

	~~LINE~~ SURVEY	STATN	G. OBSERVED	INIT RDG	FINAL RDG	INIT TIME	FINAL TIME	ELEVATION	TIDAL INIT	TIDAL FINAL	N.S.B.
GRAVITY BASE	77E4	1035	979282.42	2809.02	2808.75	938	1502	9.40	-0.084	+0.126	6.30
BAROMETRIC BASE											
BAROMETRIC FIELD											

LINE (E)	STATN (N)	RDG	TIME	TIDAL	NSB	FIELD BAROM RDG	FIELD BAROM DRY	FIELD BAROM WET	BASE BAROM RDG	BASE BAROM DRY	BASE BAROM WET	ELEVATION AHD	ELEVATION OPTIC	ELEVATION BAROM	BOUGUER ANOMALY P_1	BOUGUER ANOMALY P_2	BOUGUER ANOMALY P_3	REMARKS
19000	18000	2798.52	12.27	.050	8.514								2.641		-32.35			

GEOTERREX GRAVITY DATA SHEET

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JOB No 85-1398 AREA BOPEECHEE DATE 270282 OPERATOR SD METER CONST 1.02743 LATITUDE 29.5948 METER G586

	LINE	STATN	G. OBSERVED	INIT RDG	FINAL RDG	INIT TIME	FINAL TIME	ELEVATION	TIDAL INIT	TIDAL FINAL	N.S.B.
GRAVITY BASE	77E4	1035	979282.42	2808.94	2808.83	816	1337	79.400	-.030	.027	6.20
BAROMETRIC BASE											
BAROMETRIC FIELD											

LINE	STATN	RDG	TIME	TIDAL	NSB	FIELD BAROM RDG	FIELD BAROM DRY	FIELD BAROM WET	BASE BAROM RDG	BASE BAROM DRY	BASE BAROM WET	ELEVATION AHD	ELEVATION OPTIC	ELEVATION BAROM	BOUGUER ANOMALY P_1	BOUGUER ANOMALY P_2	BOUGUER ANOMALY P_3	REMARKS
E15000	N18000	2811.69	8.41	-.045	5.714								2.351					RPT
15000	17500	2810.38	8.50	-.050	5.357								9.457		-20.87			
15000	17000	2812.61	8.55	-.053	5.000								0.116		-20.96			
15000	16500	2812 22	9.03	-.057	4.643								3.161		-20.93			
15000	16000	2811 30	9.09	-.059	4.286								8.142		-20.98			
15200	16000	2811 35	9.15	-.061	4.426								5.968		-20.52			
15400	16000	2810.63	9.20	-.062	4.566								7.781		-21.56			
15600	16000	2810.33	9.24	-.064	4.706								6.600		-22.04			
15800	16000	2809 84	9.29	-.065	4.846								6.484		-22.47			
16000	16000	2809.16	9.34	-.067	4.986								7.485		-22.91			
16200	16000	2808.46	9.39	-.068	5.126								7.525		-23.46			
16400	16000	2807 38	9.44	-.070	5.266								9.015		-24.13			
16600	16000	2805 12	9.48	-.071	5.406								15.014		-24.98			
16800	16000	2303 41	9.52	-.072	5.546								17.747		-26.02			
17000	16000	2801.65	9.56	-.074	5.686								18.337		-27.59			
17200	16000	2800.73	10.01	-.075	5.826								16.474		-28.87			
17400	16000	2798 65	10.06	.075	5.966								20.309		-30.03			
17600	16000	2797.58	10.11	-.074	6.106								21.170		-30.83			
17800	16000	2792.67	10.23	-.073	6.246								43.457		-30.57			
18000	16000	2791.06	10.32	-.072	6.386								50.020		-30.72			
18200	16000	2786.42	10.43	-.071	6.526								71.811		-30.40			

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GEOTERREX GRAVITY DATA SHEET

JOB No 85-1298 AREA BOPEECHEE DATE 27 02 82 OPERATOR SD METER CONST 1.02763 LATITUDE 29.5948 METER G586

	LINE	STATN	G. OBSERVED	INIT RDG	FINAL RDG	INIT TIME	FINAL TIME	ELEVATION	TIDAL INIT	TIDAL FINAL	N.S.B.
GRAVITY BASE	77E4	1035	979282.42	2808.94	2808.83	816	1337	9.40	-.030	0.027	6.30
BAROMETRIC BASE											
BAROMETRIC FIELD											

LINE	STATN	RDG	TIME	TIDAL	NSB	FIELD BAROM			BASE BAROM			ELEVATION			BOUGUER ANOMALY			REMARKS
						RDG	DRY	WET	RDG	DRY	WET	AHD	OPTIC	BAROM	P_1	P_2	P_3	
E 18400	N 16000	2788.40	10.54	-.071	6.666								61.272		-30.68			
18600	16000	2789.82	11.05	-.068	6.806								55.461		-30.45			
18800	16000	2790.51	11.13	-.064	6.946								50.083		-30.87			
19000	16000	2788.89	11.17	-.062	7.086								53.984		-31.54			
19200	16000	2792.56	11.22	-.060	7.226								33.523		-32.35			
19400	16000	2795.95	11.27	-.058	7.366								15.616		-32.87			
19600	16000	2796 54	11.33	-.055	7.506								14.075		-32.52			
19800	16000	2797 57	11.37	-.053	7.646								9.78		-32.34			
20000	16000	2798.81	11.41	-.052	7.786								0.688		-33.05			
19000	14000	2799 83	11.59	-.043	5.657								2.891		-32.97			
18800	14000	2799 83	12.30	-.022	5.517								2.653		-33.09			
18600	14000	2799 39	12.35	-.019	5.377								5.447		-33.00			
18400	14000	2799 23	12.42	-.014	5.237								5.653		-33.21			
18200	14000	2799.19	12.46	-.011	5.097								5.968		-33.27			
18000	14000	2799 43	12.52	-.007	4.957								3.568		-33.67			
17800	14000	2799 06	12.56	-.004	4.817								4.457		-33.94			
17600	14000	2799.45	13.01	.000	4.677								3.924		-33.75			
17400	14000	2799.13	13.05	.003	4.537								11.107		-32.53			
17200	14000	2798 44	13.14	.010	4.397								16.417		-32.11			
17000	14000	2799.99	13.19	0.014	4.257								14.642		-31.02			
16000	16000	2809.04	13.27	.020									7.485					RPT

GEOTERREX GRAVITY DATA SHEET

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JOB No 85-1398 AREA BOPEECHEE DATE 27 02 82 OPERATOR SD METER CONST 1.02763 LATITUDE 29.5948 METER G586

	LINE	STATN	G. OBSERVED	INIT RDG	FINAL RDG	INIT TIME	FINAL TIME	ELEVATION	TIDAL INIT	TIDAL FINAL	N.S.B.
GRAVITY BASE	77E4	1035	979282.42	2808.83	2808.91	1337	1954	9.40	0.027	-.008	6.30
BAROMETRIC BASE											
BAROMETRIC FIELD											

LINE	STATN	RDG	TIME	TIDAL	NSB	FIELD BAROM RDG	FIELD BAROM DRY	FIELD BAROM WET	BASE BAROM RDG	BASE BAROM DRY	BASE BAROM WET	ELEVATION AHD	ELEVATION OPTIC	ELEVATION BAROM	BOUGUER ANOMALY P_1	BOUGUER ANOMALY P_2	BOUGUER ANOMALY P_3	REMARKS
E 16200	N 16000	2808.31	13.47	0.035		10							7.525		- -			RPT
19000	12000	2797.92	14.50	.078	4.229	[illegible]							10.900		-33.96			
18800	12000	2798.41	14.53	.080	4.089	76							10.000		-33.76			
18600	12000	2798.90	14.56	082	3.949	79							9.025		-33.58			
18400	12000	2799.12	15.00	085	3.809	[illegible]							9.530		-33.33			
18200	12000	2800.02	15.09	088	3.669	[illegible]							6.512		-33.19			
18000	12000	2799.82	15.13	.090	3.529	96							7.715		-33.16			
17800	12000	2799.66	15.17	.091	3.389	100							9.657		-33.04			
17600	12000	2800.63	15.22	.093	3.249	[illegible]							10.099		-32.67			
17400	12000	2800.14	15.26	.095	3.109	[illegible]							10.401		-32.56			
17200	12000	2800.75	15.30	.096	2.969	[illegible]							10.848		-31.93			
17000	12000	2802.80	15.36	098	2.829	[illegible]							8.538		-30.45			
16800	12000	2803.08	15.42	100	2.689	[illegible]							13.978		-29.01			
16600	12000	2804.14	15.47	102	2.549	[illegible]							15.042		-27.78			
16400	12000	2804.00	15.52	104	2.409	[illegible]							22.293		-26.26			
16200	12000	2805.07	15.55	105	2.269	[illegible]							22.688		-25.26			
16000	12000	2805.90	15.59	.107	2.129	[illegible]							23.906		-24.23			
15800	12000	2807.48	16.03	107	1.989	[illegible]							20.881		-23.39			
15600	12000	2807.38	16.07	.107	1.849	[illegible]							25.441		-22.56			
15400	12000	2807.82	16.12	.107	1.709	[illegible]							24.914		-22.32			
15200	12000	2808.26	16.15	.107	1.569	[illegible]							25.304		-21.94			
15000	12000	2807.85	16.21	.106	1.429	[illegible]							27.722		-21.84			

GEOTERREX GRAVITY DATA SHEET

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JOB No 85-1398 AREA BOPEECHEE DATE 27 02 82 OPERATOR SD METER CONST 1.02763 LATITUDE 29.5948 METER G586

	LINE	STATN	G. OBSERVED	INIT RDG	FINAL RDG	INIT TIME	FINAL TIME	ELEVATION	TIDAL INIT	TIDAL FINAL	N.S.B.
GRAVITY BASE	77E4	1035	979282.42	2808.83	2808.91	1337	1954	9.40	0.027	-.008	6.30
BAROMETRIC BASE											
BAROMETRIC FIELD											

LINE	STATN	RDG	TIME	TIDAL	NSB	FIELD BAROM RDG	FIELD BAROM DRY	FIELD BAROM WET	BASE BAROM RDG	BASE BAROM DRY	BASE BAROM WET	ELEVATION AHD	ELEVATION OPTIC	ELEVATION BAROM	BOUGUER ANOMALY p_1	BOUGUER ANOMALY p_2	BOUGUER ANOMALY p_3	REMARKS
E 11000	N 12000	2801.04	17.03	.104	-1.371	226							47.395		-26.29			
11200	12000	2800.07	17.08	102	-1.231	211							49187		-26.78			
11400	12000	2800.90	1712	100	-1.091	215							46171		-26.52			
11600	12000	2801 10	17.15	.099	-0.951	218							45.192		-26.45			
11800	12000	2801 52	1718	.097	-0.811	221							45.177		-25.92			
12000	12000	2802.14	17.23	.095	-0.671	[illegible]							42.957		-25.70			
12200	12000	2804.05	1728	.093	-0.531	221							38.049		-24.77			
12400	12000	2806.11	17.33	.091	-0.391	[illegible]							31622		-24.03			
12600	12000	2807 25	17.37	089	-0.251	[illegible]							28902		-23.38			
12800	12000	2806.70	17.40	.088	-0.111	[illegible]							34002		-22.68			
13000	12000	2806 33	17.43	.086	0.029	[illegible]							37.403		-22.19			
13200	12000	2807 56	1747	.085	0.169	[illegible]							33409		-21.75			
13400	12000	2808 34	1750	.083	0.309	[illegible]							32.574		-21.04			
13600	12000	2808 74	1754	.082	0.449	[illegible]							32.124		-20.64			
13800	12000	2807. 10	1758	.080	0.589	[illegible]							39036		-20.64			
14000	12000	2806 98	1802	.078	0.729	[illegible]							39611		-20.54			
14200	12000	2807 09	18.05	.075	0.869	[illegible]							39131		-20.44			
14400	12000	2807 70	18-09	.072	1.009	[illegible]							33.873		-20.93			
14600	12000	2807 83	18.13	.069	1.149	22.							30.853		-21.39			
14800	12000	2807.56	18.17	.067	1.289	28[illegible]							29.817		-21.87			
15000	12000	2807 95	18.21	064		284							27.722					RPT

GEOTERREX GRAVITY DATA SHEET

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JOB No 85-1398 AREA BOPEECHEE DATE 270282 OPERATOR SD METER CONST 1.02763 LATITUDE 29.5948 METER G586

	LINE	STATN	G. OBSERVED	INIT RDG	FINAL RDG	INIT TIME	FINAL TIME	ELEVATION	TIDAL INIT	TIDAL FINAL	N.S.B.
GRAVITY BASE	77E4	1035	979282.42	2808.83	2808.91	1337	1954	9.40	0.027	-.008	6.30
BAROMETRIC BASE											
BAROMETRIC FIELD											

LINE (E)	STATN (N)	RDG	TIME	TIDAL	NSB	FIELD BAROM RDG	FIELD BAROM DRY	FIELD BAROM WET	BASE BAROM RDG	BASE BAROM DRY	BASE BAROM WET	ELEVATION AHD	ELEVATION OPTIC	ELEVATION BAROM	BOUGUER ANOMALY P_1	BOUGUER ANOMALY P_2	BOUGUER ANOMALY P_3	REMARKS
E 15000	N 12500	2806.37	18.29	.058	1.786								32.294		-22.13			
15000	13000	2806.40	18.36	.053	2.143								30.997		-22.15			
15000	13500	2807.02	18.41	.049	2.500								26.422		-22.32			
15000	14000	2807.45	18.47	.045	2.857								24.802		-22.00			
15200	14000	2807.64	18.52	.041	2.997								21.865		-22.39			
15400	14000	2808.16	18.55	.039	3.137								18.019		-22.64			
15600	14000	2807.67	18.59	.036	3.277								18.499		-22.94			
15800	14000	2807.06	19.03	.033	3.417								19.819		-23.17			
16000	14000	2806.54	19.08	.029	3.557								19.127		-23.77			
16200	14000	2806.03	19.12	.025	3.697								16.552		-24.79			
16400	14000	2804.85	19.16	.022	3.837								14.533		-26.37			
16600	14000	2803.03	19.20	.019	3.977								13.850		-28.30			
16800	14000	2801.69	19.25	.015	4.117								13.763		-29.61			
17000	14000	2800.06	19.30	.011														Repeat
16200	16000	2808.45	19.39	.004														Repeat
16000	16000	2809.15	19.44	.000														Repeat

GEOTERREX GRAVITY DATA SHEET

JOB No 85-1398 AREA BOPEECHEE DATE 280282 OPERATOR SD METER CONST 1.02763 LATITUDE 29.5948 METER G586

	~~LINE~~ SURVEY	STATN	G. OBSERVED	INIT RDG	FINAL RDG	INIT TIME	FINAL TIME	ELEVATION	TIDAL INIT	TIDAL FINAL	N.S.B.
GRAVITY BASE	7764	1035	979282.42	2808.81	2808.81	0834	1315	9.400	+0.004	-0.021	6.30
BAROMETRIC BASE											
BAROMETRIC FIELD											

LINE (E)	STATN (N)	RDG	TIME	TIDAL	NSB	FIELD BAROM RDG	FIELD BAROM DRY	FIELD BAROM WET	BASE BAROM RDG	BASE BAROM DRY	BASE BAROM WET	ELEVATION AHD	ELEVATION OPTIC	ELEVATION BAROM	BOUGUER ANOMALY P_1	BOUGUER ANOMALY P_2	BOUGUER ANOMALY P_3	REMARKS
16200	16000	2808.39	845	-0.003									7.525					RPT
16000	16000	2809.04	849	-0.006									7.485					RPT
15000	16000	2811.24	900	-0.013									8.142					RPT
15000	18000	2811.60	916	-0.021									2.351					RPT.
14800	18000	2810.84	922	-0.024									5.622		-21.00			
14600	18000	2810.13	926	-0.026									7.963		-21.30			
14400	18000	2810.40	930	-0.029									7.062		-21.32			
14200	18000	2811.35	934	-0.031									2.420		-21.28			
14000	18000	2811.56	938	-0.033									1.403		-21.63			
13800	18000	2810.81	943	-0.035									2.608		-22.22			
13600	18000	2810.42	948	-0.038									7.358		-22.78			
13400	18000	2809.72	952	-0.040									2.568		-23.55			
13200	18000	2808.60	957	-0.042									5.413		-24.15			
13000	18000	2807.24	1000	-0.044									9.648		-24.72			
12800	18000	2805.38	1003	-0.045									10.935		-25.88			
12600	18000	2804.67	1008	-0.046									14.541		-26.39			
12400	18000	2803.68	1020	-0.048									18.743		-26.54			
12200	18000	2803.75	1027	-0.050									15.291		-26.68			
12000	18000	2803.57	1033	-0.051									16.391		-26.94			
11800	18000	2804.09	1037	-0.052									15.801		-27.09			
11600	18000	2803.98	1044	-0.054									16.513		-26.68			
11400	18000	2804.98	1048	-0.054									18.416		-25.78			
11200	18000	2807.02	1052	-0.055									15.399		-24.47			
			-															

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GEOTERREX GRAVITY DATA SHEET

JOB No 85-1398 AREA BOPEECHEE DATE 250282 OPERATOR SD METER CONST 1.02763 LATITUDE 29.5948 METER G586

	SURVEY ~~LINE~~	STATN	G. OBSERVED	INIT RDG	FINAL RDG	INIT TIME	FINAL TIME	ELEVATION	TIDAL INIT	TIDAL FINAL	N.S.B.
GRAVITY BASE	77E4	1035	979282.42	2808.81	2808.81	0834	1315	9.400	+0.004	-0.021	6.30
BAROMETRIC BASE											
BAROMETRIC FIELD											

LINE (E)	STATN (N)	RDG	TIME	TIDAL	NSB	FIELD BAROM RDG	FIELD BAROM DRY	FIELD BAROM WET	BASE BAROM RDG	BASE BAROM DRY	BASE BAROM WET	ELEVATION AHD	ELEVATION OPTIC	ELEVATION BAROM	BOUGUER ANOMALY P_1	BOUGUER ANOMALY P_2	BOUGUER ANOMALY P_3	REMARKS
11000	18000	2809.15	1055	-0.056	2.914	/							13.699		-22.77			
10000	16000	2514.10	1108	-0.056	0.786	/							21.341		-17.41			
10200	16000	2513.40	1112	-0.056	0.926								22.356		-17.80			
10400	16000	2512.00	1115	-0.056	1.066								23.161		-18.96			
10600	16000	2509.55	1120	-0.055	1.206								24.325		-20.80			
10800	16000	2507.80	1124	-0.055	1.346								25.555		-22.53			
11000	16000	2506.22	1128	-0.055	1.486								26.173		-23.91			
11200	16000	2504.00	1132	-0.054	1.626								30.081		-25.20			
11400	16000	2502.42	1137	-0.054	1.766								33.558		-25.93			
11600	16000	2501.26	1142	-0.054	1.906								35.660		-26.74			
11800	16000	2500.85	1147	-0.053	2.046								35.935		-26.77			
12000	16000	2501.36	1152	-0.053	2.186								35.411		-26.30			
17200	16000	2802.03	1156	-0.052	2.326								33.508		-25.95			
12400	16000	2502.56	1159	-0.052	2.466								30.525		-25.99			
12600	16000	2502.04	1203	-0.051	2.606								31.901		-26.11			
12800	16000	2502.52	1207	-0.049	2.746								25.544		-25.87			
13000	16000	2505.90	1211	-0.048	2.586								20.193		-24.74			
13200	16000	2507.32	1215	-0.046	3.026								17.193		-23.75			
13400	16000	2805.40	1220	-0.044	3.166								14.976		-23.05			
13600	16000	2509.17	1223	-0.043	3.306								13.463		-22.51			
13800	16000	2510.14	1227	-0.042	3.446								11.553		-21.84			
14000	16000	2510.66	1242	-0.036	3.556								11.358		-21.25			
14200	16000	2810.21	1246	-0.034	3.726								13.765		-21.06			
14400	16000	2810.55	1250	-0.033	3.566								12.220		-20.97			

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GEOTERREX GRAVITY DATA SHEET

JOB No 85-1399 AREA BOPEECHEE DATE 280282 OPERATOR SD METER CONST 1.027763 LATITUDE 29.5948 METER G586

	~~LINE~~	STATN	G. OBSERVED	INIT RDG	FINAL RDG	INIT TIME	FINAL TIME	ELEVATION	TIDAL INIT	TIDAL FINAL	N.S.B.
GRAVITY BASE	77E4	1035	979282.42	2808.81	2808.81	0834	1315	9.400	+0.004	-0.021	6.30
BAROMETRIC BASE											
BAROMETRIC FIELD											

LINE (E)	STATN (N)	RDG	TIME	TIDAL	NSB	FIELD BAROM RDG	FIELD BAROM DRY	FIELD BAROM WET	BASE BAROM RDG	BASE BAROM DRY	BASE BAROM WET	ELEVATION AHD	ELEVATION OPTIC	ELEVATION BAROM	BOUGUER ANOMALY P_1	BOUGUER ANOMALY P_2	BOUGUER ANOMALY P_3	REMARKS
14600	16000	2810.77	1254	-0.031	4.006								10.538		-21.03			
14800	16000	2810.74	1255	-0.030	4.146								10.438		-20.99			
15000	16000	2811.18	1302	-0.028									8.142					RPT.

GEOTERREX GRAVITY DATA SHEET

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JOB No 85-1398 AREA ZOPEECHEE DATE 270282 OPERATOR SD METER CONST 1.02763 LATITUDE 29.5948 METER G586

	LINE	STATN	G. OBSERVED	INIT RDG	FINAL RDG	INIT TIME	FINAL TIME	ELEVATION	TIDAL INIT	TIDAL FINAL	N.S.B.
GRAVITY BASE	77E4	1035	979282.42	2808.81	2808.78	1315	1907	9.40	-.021	.035	6.30
BAROMETRIC BASE											
BAROMETRIC FIELD											

LINE (E)	STATN (N)	RDG	TIME	TIDAL	NSB	FIELD BAROM RDG	FIELD BAROM DRY	FIELD BAROM WET	BASE BAROM RDG	BASE BAROM DRY	BASE BAROM WET	ELEVATION AHD	ELEVATION OPTIC	ELEVATION BAROM	BOUGUER ANOMALY P_1	BOUGUER ANOMALY P_2	BOUGUER ANOMALY P_3	REMARKS
E 16000	N 16000	2808.88	15.15	.046														Repeat
15000	16000	2811.10	15.26	.051														Repeat
15000	15500	2810.10	15.36	.055	3.929								10.787		-21.64			
15000	15000	2809.74	15.42	.058	3.571								13.487		-21.64			
15000	14500	2809.83	15.48	.061	3.214								14.383		-21.58			
15000	14000	2807.28	15.57	.065														Repeat
11000	14000	2799.18	16.42	.073	0.057								55.853		-25.22			
11200	14000	2797.47	16.47	.074	0.197								62.077		-25.45			
11400	14000	2798.64	16.55	.075	0.337								51.114		-26.66			
11600	14000	2796.38	17.00	.076	0.477								64.622		-25.79			
11800	14000	2798.62	17.04	.075	0.617								55.045		-25.59			
12000	14000	2800.80	17.08	.075	0.757								45.077		-25.54			
12200	14000	2801.92	17.13	.074	0.897								39.677		-25.53			
12400	14000	2802.53	17.17	.073	1.037								38.064		-25.17			
12600	14000	2804.43	17.22	.073	1.177								34.077		-24.04			
12800	14000	2805.93	17.26	.072	1.317								30.886		-23.13			
13000	14000	2806.97	17.30	.072	1.457								27.896		-22.69			
13200	14000	2808.33	17.34	.071	1.597								24.171		-22.01			
13400	14000	2808.97	17.38	.070	1.737								22.525		-21.63			
13600	14000	2809.72	17.43	.070	1.877								21.469		-21.00			
13800	14000	2810.20	17.47	.069	2.017								20.358		-20.67			
14000	14000	2810.27	17.50	.069	2.157								19.029		-20.80			
14200	14000	2810.38	17.55	.068	2.297								16.981		-21.06			
14400	14000	2810.16	18.00	.067	2.437								17.267		-21.13			

GEOTERREX GRAVITY DATA SHEET

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JOB No 85-1398 AREA GOPEECHEE DATE 270282 OPERATOR SD METER CONST 1.02763 LATITUDE 29.5948 METER C586

	LINE	STATN	G. OBSERVED	INIT RDG	FINAL RDG	INIT TIME	FINAL TIME	ELEVATION	TIDAL INIT	TIDAL FINAL	N.S.B.
GRAVITY BASE	77E4	1035	979282.42	2808.81	2808.78	1315	1907	79.40	-.021	.035	6.30
BAROMETRIC BASE											
BAROMETRIC FIELD											

LINE (E)	STATN (N)	RDG	TIME	TIDAL	NSB	FIELD BAROM			BASE BAROM			ELEVATION			BOUGUER ANOMALY			REMARKS
						RDG	DRY	WET	RDG	DRY	WET	AHD	OPTIC	BAROM	P_1	P_2	P_3	
E 14600	N 14000	2809.63	18.04	.065	2.577								18.009		-21.41			
14800	14000	2808.65	18.07	.064	2.717								20.714		-21.70			
15000	14000	2807.32	18.12	.061	2.857								24.802					Repeat
17000	14000	2799.87	18.24	.056	4.257								14.642					Repeat
17200	14000	2798.33	18.28	.054	4.397								16.417					Repeat
16000	16000	2808.92	18.54	.042									7.485					Repeat
16200	16200	2808.30	18.58	.040									7.525					Repeat.

APPENDIX C

TIDAL CORRECTION PRINTOUT

S.A. LATITUDE = 29 35.0 S LONGITUDE = 137 25.0 E

****
* TIME = GMT+ 10H 30M *
****

TIDAL GRAVITY CORRECTIONS IN MICROGALS

DATE / TIME		100	200	300	400	500	600	700	800	900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	2400
1982 FEBRUARY	1	-55	-29	3	36	63	79	81	71	52	29	7	-8	-15	-12	0	15	29	36	33	19	-2	-27	-49	-62
	2	-63	-49	-24	8	42	71	92	100	95	78	54	26	1	-16	-24	-22	-14	-2	6	9	2	-11	-30	-48
	3	-60	-62	-50	-25	8	45	81	109	123	122	105	76	39	3	-26	-44	-49	-42	-28	-13	-3	-2	-12	-29
	4	-48	-62	-67	-57	-31	5	50	94	129	148	148	127	90	43	-3	-42	-67	-73	-63	-43	-21	-4	0	-7
	5	-26	-50	-69	-77	-67	-39	5	58	110	150	171	168	140	93	36	-19	-63	-87	-89	-73	-45	-15	4	9
	6	-2	-27	-56	-80	-89	-77	-42	9	70	127	170	188	178	141	84	20	-39	-82	-101	-95	-69	-34	0	19
	7	20	1	-30	-65	-92	-99	-81	-39	19	85	144	183	194	174	128	64	-3	-60	-96	-105	-88	-54	-13	19
	8	35	28	2	-36	-74	-99	-102	-77	-28	35	102	156	187	187	156	102	35	-28	-77	-101	-98	-71	-30	10
	9	40	48	33	0	-42	-80	-100	-95	-64	-10	53	114	159	177	165	125	67	3	-51	-87	-97	-81	-46	-3
	10	35	57	56	33	-4	-47	-79	-92	-80	-43	10	69	119	150	155	132	87	30	-25	-67	-88	-84	-58	-18
	11	23	54	67	58	30	-8	-46	-72	-76	-58	-20	28	77	114	130	122	91	46	-3	-46	-74	-80	-64	-32
	12	7	43	66	71	56	26	-9	-40	-57	-55	-34	0	40	75	97	100	83	51	11	-28	-57	-70	-64	-42
	13	-8	26	56	71	69	52	24	-4	-27	-38	-32	-13	13	41	63	72	66	46	17	-14	-41	-58	-60	-47
	14	-22	8	38	61	71	67	51	28	5	-11	-17	-13	0	16	32	42	43	33	15	-6	-28	-44	-51	-46
	15	-31	-8	18	43	61	69	67	55	38	20	6	-1	-2	1	8	15	17	15	7	-4	-19	-31	-40	-42
	16	-36	-22	-2	21	43	61	71	72	65	52	36	20	7	-1	-6	-7	-6	-5	-5	-8	-13	-20	-28	-33
	17	-35	-31	-20	-2	19	43	64	79	85	80	67	48	26	5	-11	-22	-27	-26	-22	-16	-12	-12	-15	-22
	18	-29	-34	-33	-24	-6	19	48	74	94	102	97	80	53	22	-6	-29	-42	-45	-39	-28	-16	-7	-4	-9
	19	-19	-32	-41	-42	-32	-9	23	59	92	114	121	110	84	48	8	-26	-50	-61	-57	-43	-24	-6	4	4
	20	-5	-22	-41	-53	-54	-38	-7	34	78	115	136	137	116	79	32	-13	-50	-70	-72	-59	-35	-9	10	18
	21	11	-7	-32	-56	-68	-63	-39	2	53	102	139	154	144	111	62	7	-40	-72	-84	-74	-49	-17	12	29
	22	29	13	-15	-48	-73	-81	-68	-32	20	77	128	159	163	140	94	36	-21	-66	-88	-87	-64	-28	8	36
	23	46	36	8	-29	-65	-87	-88	-64	-17	42	102	148	169	160	123	66	3	-50	-85	-95	-78	-43	0	36
	24	58	59	37	0	-43	-79	-96	-87	-52	2	65	122	159	166	143	94	32	-28	-74	-96	-89	-59	-14	30
	25	63	76	65	33	-10	-55	-86	-95	-77	-34	23	83	131	155	148	113	58	-3	-56	-89	-94	-73	-32	16
	26	59	86	88	67	28	-18	-60	-85	-86	-61	-15	39	91	126	136	117	75	19	-35	-75	-92	-82	-49	-2
	27	45	83	100	94	66	24	-20	-56	-75	-70	-43	-1	45	85	107	105	79	35	-13	-57	-82	-85	-63	-24
	28	23	67	98	108	96	66	26	-13	-44	-57	-52	-29	4	39	66	76	67	39	1	-37	-67	-79	-70	-43

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S.A. LATITUDE = 29 35.0 S LONGITUDE = 137 25.0 E

****
* TIME = GMT+ 10H 30M *
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TIDAL GRAVITY CORRECTIONS IN MICROGALS

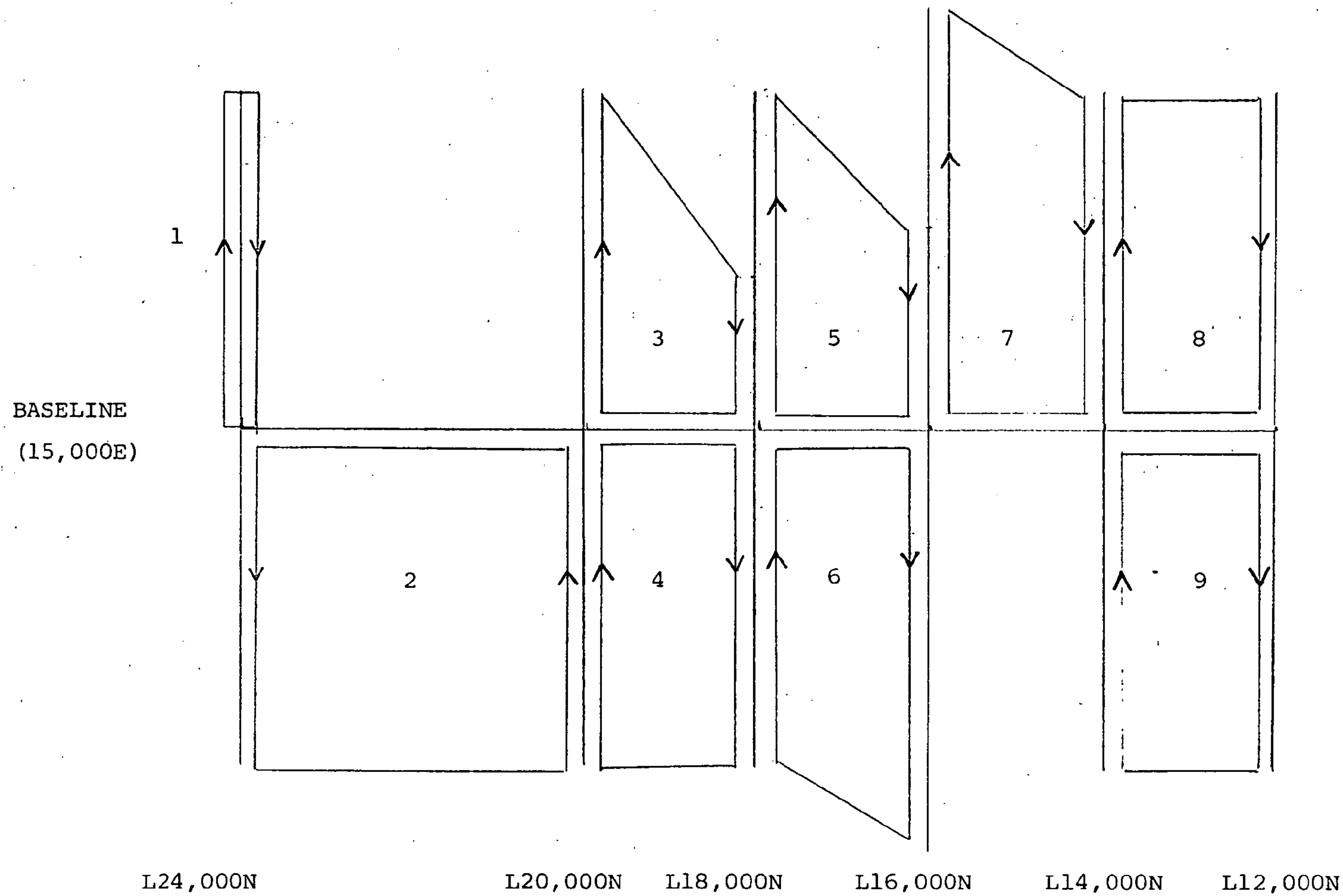
DATE /	TIME=	100	200	300	400	500	600	700	800	900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	2400
1982 MARCH	1	-2	41	79	103	109	97	70	35	1	-24	-38	-36	-22	0	22	37	40	30	7	-21	-48	-65	-68	-55
	2	-27	9	48	81	102	108	100	79	51	22	-3	-20	-27	-24	-14	-3	5	7	1	-12	-30	-47	-57	-56
	3	-44	-20	10	44	75	98	109	108	95	72	44	15	-9	-27	-36	-36	-30	-22	-15	-13	-18	-27	-37	-46
	4	-48	-41	-24	2	33	66	95	115	122	115	94	63	27	-7	-36	-53	-58	-52	-39	-24	-13	-10	-14	-25
	5	-38	-47	-47	-36	-12	21	60	97	126	139	135	112	74	28	-16	-52	-73	-77	-64	-42	-18	0	6	0
	6	-15	-36	-54	-61	-52	-26	13	60	106	140	156	148	119	72	17	-33	-72	-89	-85	-63	-31	0	22	27
	7	14	-10	-41	-66	-76	-66	-35	12	67	118	154	166	151	112	56	-3	-56	-89	-97	-81	-47	-6	28	47
	8	45	23	-13	-51	-80	-89	-74	-34	20	80	131	162	166	140	91	29	-31	-77	-99	-94	-64	-20	25	58
	9	70	57	23	-21	-64	-92	-95	-71	-24	35	94	139	160	151	114	58	-3	-57	-91	-98	-77	-35	14	58
	10	84	85	60	16	-33	-75	-97	-91	-59	-7	51	104	138	145	123	78	20	-35	-77	-95	-85	-50	-1	49
	11	86	101	89	53	4	-44	-80	-93	-78	-40	11	64	105	125	118	86	37	-15	-60	-86	-86	-61	-17	33
	12	78	105	106	83	41	-7	-51	-78	-80	-59	-19	27	69	96	101	82	45	0	-43	-73	-81	-66	-31	15
	13	62	96	111	101	71	28	-16	-51	-67	-62	-37	-1	35	64	76	69	44	8	-29	-58	-72	-66	-41	-1
	14	41	80	103	106	89	57	17	-18	-43	-51	-41	-19	9	34	49	50	35	10	-19	-45	-61	-61	-45	-15
	15	21	58	84	99	96	76	47	14	-12	-29	-33	-24	-8	9	23	27	21	6	-13	-34	-48	-52	-44	-25
	16	3	34	63	83	90	84	67	44	19	-1	-14	-18	-14	-7	0	5	4	-2	-13	-25	-36	-41	-39	-28
	17	-10	13	37	59	75	81	78	66	49	29	11	-2	-11	-15	-15	-14	-13	-14	-17	-21	-25	-28	-29	-26
	18	-17	-4	12	32	51	67	77	79	73	60	42	21	2	-13	-24	-30	-32	-29	-25	-20	-16	-15	-15	-17
	19	-18	-16	-9	4	22	44	65	81	89	86	73	51	24	-2	-25	-41	-47	-45	-36	-23	-11	-2	0	-3
	20	-11	-19	-24	-21	-7	14	42	71	94	105	101	82	52	17	-17	-44	-59	-61	-50	-31	-9	7	16	14
	21	3	-14	-30	-39	-36	-18	12	49	86	112	122	112	84	43	0	-39	-65	-74	-65	-42	-13	14	32	36
	22	24	1	-29	-48	-58	-50	-23	17	64	105	131	134	113	73	23	-26	-64	-82	-79	-56	-21	15	44	57
	23	51	27	-7	-43	-68	-74	-57	-20	31	83	124	144	136	102	51	-5	-54	-85	-91	-72	-35	9	50	75
	24	79	59	21	-23	-63	-86	-85	-57	-9	48	102	137	145	124	78	20	-37	-80	-97	-86	-52	-2	48	86
	25	103	93	59	10	-40	-80	-98	-87	-50	4	64	112	138	133	99	44	-15	-67	-96	-97	-69	-20	36	86
	26	117	122	98	53	-2	-55	-91	-101	-81	-37	18	73	112	124	106	63	6	-48	-87	-100	-84	-41	15	73
	27	118	139	131	96	43	-14	-63	-92	-94	-69	-25	26	71	97	96	69	23	-28	-72	-96	-92	-61	-10	49
	28	103	139	148	130	89	35	-19	-62	-84	-81	-56	-16	25	57	71	61	31	-11	-53	-83	-91	-74	-34	18
	29	74	119	145	146	123	82	32	-15	-51	-68	-65	-44	-14	14	34	38	25	-2	-35	-64	-80	-77	-52	-11
	30	37	85	121	139	137	114	78	36	-4	-34	-50	-51	-39	-21	-3	7	7	-3	-22	-44	-62	-67	-58	-33
	31	2	43	81	111	126	125	108	80	47	13	-15	-34	-43	-42	-34	-24	-17	-14	-19	-28	-39	-48	-50	-41

*** END TIDYTIDE. ***

APPENDIX D

PLAN SHOWING LEVELLING LOOP MISCLOSURES

PLAN SHOWING LEVELLING LOOP MISCLOSURES



LOOP MISCLOSURES

LOOP 1	-	+4.3cm
LOOP 2	-	-1.5cm
LOOP 3	-	+0.6cm
LOOP 4	-	+4.1cm
LOOP 5	-	+3.0cm
LOOP 6	-	+7.6cm
LOOP 7	-	+1.4cm
LOOP 8	-	+8.9cm
LOOP 9	-	+0.1cm

APPENDIX E

'BOPEECHEE' LEVEL DATA

JOB # 85-1398

BOPEECHEE, S.A

Date 12/12/82 Levels taken for

From COLLIMATION CHECK To

BACK SIGHT	INTER-MEDIATE	FORE SIGHT	RISE	FALL	REDUCED LEVEL	DISTANCE	CROSS SECTION LEFT	CROSS SECTION RIGHT	REMARKS
1·105			Δ = .625						
	1·730								
1·465									
	0·840		Δ = .625						

Date 12/12/82 Levels taken for BASELINE (15000E)

From ~~BE~~ 24000N To 21500N

BACK SIGHT	INTER-MEDIATE	FORE SIGHT	RISE	FALL	REDUCED LEVEL	DISTANCE	CROSS SECTION LEFT	CROSS SECTION RIGHT	REMARKS
2.390									15000E, 24000N
		1.745							
1.435									
		1.950							
1.930									
		1.500							
1.325									
	1.452								23500N
		0.590							
3.415									
		1.270							~~23000N~~
	1.270								23000N
3.255									
		3.500							
3.260									
	3.060								22500
		2.460							
1.505									
	1.384								22000 (9.00)
		2.400							
3.110									
	2.010								21500

Date 12/12/82 Levels taken for BASELINE (15000E

From 21000 N To 19000 N

BACK SIGHT	INTER-MEDIATE	FORE SIGHT	~~RISE~~ FS-BS	FALL	REDUCED LEVEL	DISTANCE	CROSS SECTION LEFT	CROSS SECTION RIGHT	REMARKS
		2.185							
3.330									
	1.150								21000
		0.510							
4.835									
		3.885							
3.270									
	3.820								20500
		0.430							
1.830					~~110.377~~				
	3.315				108.892	5.560			20000 (9.55)
		2.385							
~~1.030~~ 0.975			1.410	1.410					
		3.490							
0.270			3.220 ~~4.630~~	4.630					
	1.742				105.835	2.503			19500
		1.235							
2.430			-1.195	3.435					
	0.680				108.092	4.760			19000
~~0.24~~ 0.800		0.440							

Date 12/2/82 Levels taken for BASELINE

From 18500N To 17500N

BACK SIGHT	INTER-MEDIATE	FORE SIGHT	~~RISE~~ FS-BS	FALL	REDUCED LEVEL	DISTANCE	CROSS SECTION LEFT	CROSS SECTION RIGHT	REMARKS
		3.610							
0.755			2.555	5.990					
	1.035				105.182	1.850			18500
		0.050							
4.440									
		0.275							
4.665									
		0.353							
2.598									
		4.585							
0.050									
		4.712							
0.638			-2.416	3.574					
		2950							
	2.950				105.683	2.351			18000
3.435									
		0.565							
2.170									
		0.072							
3.860			-5.878	-2.304					
	1.722				112.789	9.457			17500
		4.815							

Date 12/2/82 Levels taken for BASELINE

From 17000 N To 16000 N

BACK SIGHT	INTER-MEDIATE	FORE SIGHT	RISE	FALL	REDUCED LEVEL	DISTANCE	CROSS SECTION LEFT	CROSS SECTION RIGHT	REMARKS
0.557									
		4.895							
0.285									
		2.135							
3.680			7.323	5.019					
	3.690				103.498	0.116			17000
		2.735							
2.060			0.675	5.694					
		0.020							
	0.020				106.493	3.161			16500
4.890									
		0.500							
1.960			-6.330	-0.636					
	1.369				111.474	8.142			16000
		1.369							

Date 13/12/82 Levels taken for BASELINE.

From 16000N To 14500N

BACK SIGHT	INTER-MEDIATE	FORE SIGHT	RISE	FALL	REDUCED LEVEL	DISTANCE	CROSS SECTION LEFT	CROSS SECTION RIGHT	REMARKS
2.370					111.474	8.142			15000E, 16000N
		0.350							
3.765									
		2.825							
1.305			-1.895	-1.895					
	1.620				114.119	10.787			15500 N
		1.355							
2.485									
		1.235							
2.605			-2.500	-4.395					
	1.420				116.819	13.487			15000 N.
		1.420							
3.350									
		1.060							
0.870									
		1.880							
1.896			-1.756	-6.151					
	2.280				117.715	14.383			14500 N
		0.155							
4.758									
		1.014							
4.895									

Date 13/12/82 Levels taken for BASELINE

From 14000N To 12000N

BACK SIGHT	INTER-MEDIATE	FORE SIGHT	RISE	FALL	REDUCED LEVEL	DISTANCE	CROSS SECTION LEFT	CROSS SECTION RIGHT	REMARKS
		0.625							
1.500			-9.359	-15.510					
	1.220				120.134	24.802			14000N
		1.955							
3.855			-1.900	-17.410					
	1.500				129.754	26.422			13500N
		0.845							
3.260									
		0.245							
2.155			-4.325	-21.735					
	1.250				134.329	30.997			13000N
		2.610							
4.952			-2.342	-24.077					
	2.295				135.626	32.294			12500N
		0.158							
1.382									
		4.230							
0.575			2.431	-21.646					
		4.525			130.965	27.633			12000N

Date 13/2/82 Levels taken for L 12000N

From 15000E To 13400 E

BACK SIGHT	INTER-MEDIATE	FORE SIGHT	RISE	FALL	REDUCED LEVEL	DISTANCE	CROSS SECTION LEFT	CROSS SECTION RIGHT	REMARKS
3.590					130.965	27.633			12000N, 15000E
	1.406				133.149	29.817			14800E
		0.370							
3.610			-3.240	-3.240					
	3.610				134.185	30.853			14600
	0.590				137.205	33.873			14400
		0.097							
4.975									
		0.520							
2.690			-7.048	-10.288					
	2.380				142.463	39.131			14200
	1.900				142.943	39.611			14000
		0.680							
1.190			-0.510	-10.798					
	2.985				142.368	39.036			13800
		4.580							
0.198									
		4.570							
1.345			7.607	-3.191					
	2.290				135.456	32.124			13600
	1.840				135.906	32.574			13400
		1.840							

Date 13/12/82 Levels taken for L12000N

From 13200E To 12200E

BACK SIGHT	INTER-MEDIATE	FORE SIGHT	RISE	FALL	REDUCED LEVEL	DISTANCE	CROSS SECTION LEFT	CROSS SECTION RIGHT	REMARKS
3.100			-1.260	-4.451					
	2.265				136.741	33.409			13200E
		0.840							
4.855			-4.015	-8.466					
	2.286				140.735	37.403			13000E
		2.410							
1.053			1.357	-7.109					
	4.330				137.334	34.002			12800
		4.330							(RAIN!!)
									2 HOURS
0.560									
		4.215							
0.530			7.455	0.346					
	1.975				132.234	28.902			12600
		0.470							
4.795			-4.325	-3.979					
	3.580				134.954	31.622			12400
		0.190							
4.820			-4.630	-8.609					
	1.783				141.381	38.049			12200
		0.790							
4.895			-4.105	-17.714					

Date 13/2/82 Levels taken for L12000N

From 12000E To 11000E

BACK SIGHT	INTER-MEDIATE	FORE SIGHT	RISE	FALL	REDUCED LEVEL	DISTANCE	CROSS SECTION LEFT	CROSS SECTION RIGHT	REMARKS
	0.980				146.289	42.957			12000E
		0.590							
3.190			-2.600	-15.314					
	1.360				148.509	45.177			11800
	1.345				148.524	45.192			11600
		1.345							
2.255			-0.910	-16.224					℄
	1.276				149.503	46.171			11400
		0.350							
3.480			-3.130	-19.354					
	1.390				152.519	49.187			11200
		1.510							
1.365			0.145	-19.209					~~11200~~
	3.037				150.727	47.395			11000
		1.300							CUTTING ACROSS TO L14000N
0.372									
		4.350							
3.825									
		0.696							
3.580									
		1.006							
3.310									

Date 13/2/82 Levels taken for L 14000N

From 11000E To 11200E

BACK SIGHT	INTER-MEDIATE	FORE SIGHT	RISE	FALL	REDUCED LEVEL	DISTANCE	CROSS SECTION LEFT	CROSS SECTION RIGHT	REMARKS
		0.310							
3.930									
		0.760							
2.940									
		0.730							
3.595									
		1.990							
2.600									
		1.280							
2.250									
		3.995							
0.690									
		4.370							~~14000N, 11000E~~
3.560			-9.865	-29.074					
	4.444				159.185	55.853			14000N, 11000E
		0.705							
3.517									
		0.732							
1.810			-3.890	-32.964					
	2.110				165.409	62.077			11200E
		4.075							
0.195									

Date 13/2/82 Levels taken for L 14000W

From 11400E To 11400E

BACK SIGHT	INTER-MEDIATE	FORE SIGHT	RISE	FALL	REDUCED LEVEL	DISTANCE	CROSS SECTION LEFT	CROSS SECTION RIGHT	REMARKS
		3.990							
0.099									
		3.525							
0.891									
			10.405	22.559					
	2.668				154.446	51.114			11400 E
		2.668							
									CONTINUED 14/2

OK

Date 14/2/82 Levels taken for L14000N

From 11400E To 12000E

BACK SIGHT	INTERMEDIATE	FORE SIGHT	~~RISE~~ FS-BS	FALL	REDUCED LEVEL	DISTANCE	CROSS SECTION LEFT	CROSS SECTION RIGHT	REMARKS
4.818					154.446	51.114			14000N, 11400E
		0.631							
4.665									
		0.634							
3.534									
		0.578							
3.764			-10.120	-10.120					
	1.430				167.954	64.622			11600E
		1.430							
0.100									
		3.790							
0.065									
		3.360							
0.393			8.022	-2.098					
	2.985				158.377	55.045			11800
		4.540							
0.081									
		4.560							
0.124			8.895	6.797					
	4.058				148.409	45.077			12000
		4.058							
0.015									

Date 14/2/82 Levels taken for L 14000 N

From 12200E To 13600E

BACK SIGHT	INTER-MEDIATE	FORE SIGHT	RISE	FALL	REDUCED LEVEL	DISTANCE	CROSS SECTION LEFT	CROSS SECTION RIGHT	REMARKS
		4.820							
0.010			8.853	15.650					T
	0.605				143.009	39.677			12200E
	2.218				141.396	38.064			12400E
		3.640							(VERY WINDY)
0.880			2.760	18.410					
	3.445				137.409	34.077			12600E
		3.510							
0.384			3.126	21.536					
	3.510				134.218	30.886			12800
		4.100							
0.660			3.440	24.976					
	3.250				131.038	27.886			13000
		4.850							
0.243			4.607	29.583					
	2.178				127.503	24.171			13200
		3.315							
0.550			2.825	32.408					
	0.999				125.857	22.525			13400
	2.055				124.801	21.469			13600
		2.680							
1.125			1.555	33.963					

Date 14/2/82 Levels taken for L 14000N

From 13800E To 15000E

BACK SIGHT	INTER-MEDIATE	FORE SIGHT	RISE	FALL	REDUCED LEVEL	DISTANCE	CROSS SECTION LEFT	CROSS SECTION RIGHT	REMARKS
	1.611				123.690	20.358			14000N, 13800E
	2.940				122.361	19.029			14000E
		2.940							
0.610			2.330	36.293					
	2.658				120.313	16.981			14200E
		1.775							
1.125			0.650	36.943					
	1.722				120.599	17.267			14400
	0.980				121.341	18.009			14600
		0.435							
2.340									
		0.500							
2.840			-4.245	32.698					
	2.520				124.046	20.714			14800
		0.312							
3.320			-3.008	29.690					
	1.440								15000
		1.440			128.134	24.802			

LOOP CLOSURE = 0.1 cm

(02)

Date 14/2/82 Levels taken for L 14000N

From 15000E To 16400E

BACK SIGHT	INTER-MEDIATE	FORE SIGHT	RISE	FALL	REDUCED LEVEL	DISTANCE	CROSS SECTION LEFT	CROSS SECTION RIGHT	REMARKS
1.440					128.134	24.802			14000N, 15000E
		3.150							
0.650			2.500	2.500					
	1.877				125.197	21.865			15200E
		3.555							
0.522			3.033	5.533					
	2.690				121.351	18.019			15400
		2.030							
1.640			0.390	5.923					
	1.820				121.831	18.499			15600
	0.500				123.151	19.819			15800
		0.500							
1.400			-0.900	5.023					
	2.092				122.459	19.127			16000
		2.795							
0.733			2.062	7.085					
	2.405				119.884	16.552			16200
		3.765							
0.600			3.165	10.25					
	1.459				117.865	14.533			16400
		1915							
1.160			0.755	11.005					

VERY WINDY!

Date 14/2/82 Levels taken for L14000N

From 16600E To 17600E

BACK SIGHT	INTER-MEDIATE	FORE SIGHT	RISE	FALL	REDUCED LEVEL	DISTANCE	CROSS SECTION LEFT	CROSS SECTION RIGHT	REMARKS
	1.387				117.182	13.850			14000N, 16600E
		1.450							
1.460			-0.010	10.995					
	1.484				117.095	13.763			16800
		1.470							
2.420			-0.950	10.045					
	1.556				117.974	14.642			17000
		0.390							
2.750			-2.360	7.685					
	2.140				119.749	16.417			17200
		2.400							
1.480									
		4.017			111..				
0.565			4.372	12.057					
	3.070				114.439	11.107.			17400
		4.457							
0.440									
		4.805							
0.135			8.687	20.744					
	1.574				107.256	3.924			17600
		1.525							
2.060			-0.535	20.209					

Date 14/2/82 Levels taken for L14000N

From 17800E To 19000E

BACK SIGHT	INTER-MEDIATE	FORE SIGHT	RISE	FALL	REDUCED LEVEL	DISTANCE	CROSS SECTION LEFT	CROSS SECTION RIGHT	REMARKS
	1.576				107.789	4.457			14000N, 17800E
	2.465				106.900	3.568			18,000 E
		2.465							
3.625									
		0.705							
1.600			-2055	18.154					
	2.120				109.300	5.968			18200
	2.435				108.985	5.653			18400
		2.435							
1.845			0.590	18.744					
	2.052				108.778	5.447			18600
		2.500							
1.350			1.150	19.894					
	3.695				105.985	2.653			18800
		2.140							
1.033			1.107	21.001					
	2.350				106.223	2.891			19000
		2.330							CROSSING
2.515									TO L 12000 N
		0.520							
2.165									
		0.134							

VERY WINDY!!

Date 14/2/82 Levels taken for CROSSOVER

From To

BACK SIGHT	INTER-MEDIATE	FORE SIGHT	RISE	FALL	REDUCED LEVEL	DISTANCE	CROSS SECTION LEFT	CROSS SECTION RIGHT	REMARKS
2.230									
		0.490							
2.405									
		1.465							
1.860									
		2.520							
1.210									
		1.250							
2.450									
		1.120							
2.225									
		1.110							
1.458			-6.971	14.030					
		1.312			114.232	10.900			L 12000N, 19000E
					OK				

Date 15/2/82 Levels taken for L12000N

From 19000E To 17400E

BACK SIGHT	INTERMEDIATE	FORE SIGHT	RISE	FALL	REDUCED LEVEL	DISTANCE	CROSS SECTION LEFT	CROSS SECTION RIGHT	REMARKS
1.240					114.232	10.900			12000N, 19000E
	2.140				113.332	10.000			18800
		2.970							
1.870			1.100	1.100					
	2.015				112.357	9.025			18600
	1.510				112.862	9.530			18400
		1.605							
1.402									
		4.525							
1.450			3.278	4.378					
	1.250				109.844	6.512			18200
		1.250							
2.255			-1.005	3.373					
	1.052				111.047	7.715			18000
		0.710							
2.937			-2.227	1.146					
	1.337				112.989	9.657			17800
	0.975				113.351	10.019			17600
		0.975							
1.975			-1.000	0.146					
	1.593				113.733	10.401			17400
		0.390							

Date 15/2/82 Levels taken for L 12000N

From 17200E To 16000E

BACK SIGHT	INTER-MEDIATE	FORE SIGHT	RISE	FALL	REDUCED LEVEL	DISTANCE	CROSS SECTION LEFT	CROSS SECTION RIGHT	REMARKS
0.674			-0.284	-0.138					
	1.430				114.180	10.848			12000N, 17200E
		3.160							
2.950			0.210	0.072					
	3.530				111.870	8.538			17000
		0.646							
3.820			-3.174	-3.102					
	1.264				117.310	13.978			16800
	0.200				118.374	15.042			16600
		0.200							
4.759									
		0.670							
3.847			-7.736	-10.838					
	0.685				125.625	22.293			16400
		0.685							
2.080			-1.395	-12.233					
	1.685				126.020	22.688			16200
		1.090							
1.850			-0.760	-12.993					
	1.227				127.238	23.906			16000
		2.622							
2.900			-0.278	-13.271					

Date 15/2/82 Levels taken for L12000 N

From 15800E To 15000E

BACK SIGHT	INTERMEDIATE	FORE SIGHT	RISE	FALL	REDUCED LEVEL	DISTANCE	CROSS SECTION LEFT	CROSS SECTION RIGHT	REMARKS
	4.530				124.213	20.881			B 12000N, 15800E
		0.210							
1.790			-1.580	-14.851					
	1.580				128.743	25.411			15600
	2.077				128.246	24.914			15400
		1.790							(2.797)
2.660			-0.870	-15.721					
	2.560				128.633	25.301			15200
		0.842							
1.157			-0.315	-16.036					
		0.454			131.054	27.722			15000

OK

LOOP CLOSURE = 8.9 cm.

Date 16/2/82 Levels taken for BASELINE (15000E)

From 14000 N To 16000 N

BACK SIGHT	INTER-MEDIATE	FORE SIGHT	RISE	FALL	REDUCED LEVEL	DISTANCE	CROSS SECTION LEFT	CROSS SECTION RIGHT	REMARKS
1 594					128096	24·764			15000E 14000N
		4·388							
0·418									
		4980							
0·218									
		2900							
2·500									
		1·470							
0·380									
		2·293							
1·717									
		3·180							
1·275									
		1957							
1·280									
		0·845							
0·995									
		1480							
2·334									MISCLOSURE = 3·8cm.
		3·705				8·142	15 000E ,		16000N
0·842						BS 0·770			
		2·370			111·474	FS 1377			15000E, 16000N

2.370
1.377
.993

Date 16/2/82 3.558 3.504 Levels taken for L16000N

From 15000E To 16200E

BACK SIGHT	INTER-MEDIATE	FORE SIGHT	~~RISE~~ CS-BS	FALL	REDUCED LEVEL	DISTANCE	CROSS SECTION LEFT	CROSS SECTION RIGHT	REMARKS
1.377			~~.993~~	2.097	111.474 (109.397)	8.142			16000N, 15000E
		3.454							
1.675			1.779	1.779 (.097)					
	1.772				~~112.844~~ (109.300)	5.968			15200
		0.860							
2.415			-1.555	0.224					
	1.514				111.113	7.781			15400
		1.570							
1.465			0.105	0.329					
	2.590				109.932	6.600			15600
		2.590							
4.270			-1.680	-1.351					
	4.385				109.817	6.485			15800
		4.385							
2.275									
		1.140							
1.515			1.735	0.384					
	1.650				110.817	7.485			16000
	1.604				110.863	7.531			14200 DAM BM 40-23
	1.610				110.857	7.525			16200
		0.640							
1.930			-1.290	-0.906					

Date 16/2/82 Levels taken for L16000N

From 16400E To 17400E

BACK SIGHT	INTER-MEDIATE	FORE SIGHT	~~RISE~~ FS–BS	FALL	REDUCED LEVEL	DISTANCE	CROSS SECTION LEFT	CROSS SECTION RIGHT	REMARKS
	1.410				112.347	9.015			16400
		1.410							
2.317									
		0.223							
4.832			−5.516	−6.422					
	0.927				118.346	15.014			16600
		0.220							
1.570									
		0.325							
4.713			−5.738	−12.160					
	3.932				121.079	17.747			16800
		1.235							
0.405			0.830	−11.330					
	2.512				121.669	18.337			17000
		4.045							
0.180									
		1.750							
4.340			1.275	−10.055					
	3.100				119.806	16.474			17200
		0.717							
2.235			−1.518	−11.575					
	0.783				123.641	20.309			17400

Date 16/2/82 Levels taken for L16000N

From 17600E To 18000E

BACK SIGHT	INTER-MEDIATE	FORE SIGHT	~~RISE~~ FS-BS	FALL	REDUCED LEVEL	DISTANCE	CROSS SECTION LEFT	CROSS SECTION RIGHT	REMARKS
		0.475							
3.970			-3.495	-15.068					
	3.417				124.502	21.170			17600E
		0.374							
4.690									
		0.496							
4.760									
		0.045							
4.900									
		0.580							
4.280									
		0.586							
4.950			-21.499	-36.567					
	2.630				146.788	43.456			17800
		0.593							
4.529									
		0.280							
4.604									
		3.378							
3.265			-8.147	-44.714					
	4.213				153.352	50.020			18000
		1.715							

Date 16/12/82 Levels taken for L/16000N

From 18200E To ~~18400~~ 18200

BACK SIGHT	INTER-MEDIATE	FORE SIGHT	RISE FS-BS	FALL	REDUCED LEVEL	DISTANCE	CROSS SECTION LEFT	CROSS SECTION RIGHT	REMARKS
3.672									
		0.885							
2.944									
		0.374							
4.838									
		0.446							
2.870									
		0.490							
4.878									
		0.469							
4.877			-19.700	-64.414					
	2.122	Σ			175.143	71.811			18200
		0.556							
4.574									
		3.420							
0.527									
		4.215							
0.122									
		4.512							
0.042									
		4.181							
3.236			13.389	-56.025					

Date 16/2/82 Levels taken for L16000N

From 18400 E To 18800

BACK SIGHT	INTER-MEDIATE	FORE SIGHT	RISE FS-BS	FALL	REDUCED LEVEL	DISTANCE	CROSS SECTION LEFT	CROSS SECTION RIGHT	REMARKS
	4.272				164.604	61.272			18400
		1.165							
4.885									
		0.350							
2.030									
		4.860							
0.525									
		4.790							
0.300									
		4.925							
0.254									
		4.300							
0.700			11.696	-44.309					
	3.765				153.415	50.083			18800
		3.765							

CONTINUED 17/2

Date 17/2/82 Levels taken for L 16000 N

From 18600 E To 19200 E

BACK SIGHT	INTER-MEDIATE	FORE SIGHT	~~RISE~~ FS-BS	FALL	REDUCED LEVEL	DISTANCE	CROSS SECTION LEFT	CROSS SECTION RIGHT	REMARKS
3.119					153.415	50.083			16000N, 18800E
		0.979							
4.130									
		0.534							
1.910			-4.527	-4.527					
	2.268				158.793	55.461			18600
		1.395							
1.410			-0.015	-4.542					
	3.760				157.316	53.984			19000
		3.760							
0.191									
		4.246							
0.142									
		4.480							
0.200									
		4.440							
0.184									
		4.680							
0.008			20.881	16.339					
	3.340				136.855	33.523			19200
		3.340							
0.046									

Date 17/2/82 Levels taken for L16000N

From 19400E To 20000E

BACK SIGHT	INTER-MEDIATE	FORE SIGHT	RISE	FALL	REDUCED LEVEL	DISTANCE	CROSS SECTION LEFT	CROSS SECTION RIGHT	REMARKS
		4.545							
0.273									
		3.820							
0.693									
		3.880							
0.185									
		4.380							
0.103			18.665	35.004					
	2.582				118.948	15.616			19400
		2.890							
0.922			1.968	36.972					
	2.155				117.407	14.075			19600
		4.460							
0.705			3.755	40.727					
	2.695				113.112	9.78			19800
		2.695							
0.752									
		3.905							
0.308									
		4.190							
1.313			8.417	49.144					
	3.370				104.020	0.688			20000

Left 3/2/[illegible]

Date 17/12/82 Levels taken for CROSSOVER

From To L16000 TO L14000

BACK SIGHT	INTERMEDIATE	FORE SIGHT	RISE	FALL	REDUCED LEVEL	DISTANCE	CROSS SECTION LEFT	CROSS SECTION RIGHT	REMARKS
		3.370							
1.520									
		0.810							
1.890									
		1.110							
1.300									
		0.895							
2.940									
		0.475							
2.300									
		2.675							
1.185									
		2.655							
0.940									
		0.650							
0.975									
		1.915							
3.195									
		1.050							
1.872			-2.512	46.632					
		3.665			106.237 (OK)	2.905			14000N, 19800E

Date 18/2/82 Levels taken for L 18000 N

From 15000E To 13600E

BACK SIGHT	INTER-MEDIATE	FORE SIGHT	RISE	FALL	REDUCED LEVEL	DISTANCE	REMARKS
3.575					105.642	2.310	18000N, 15000E
		0.397					
1.914			-1.517	-1.517			
	1.730				108.954	5.622	14800
		0.316					
3.895			-3.579	-5.096			
	3.018				111.295	7.963	14600
		0.213					
0.820							
		4.545					
1.597			2.341	-2.755			
	1.578				110.394	7.062	14400
		4.735					
0.168			4.567	1.812			
	0.653				106.752	3.420	14200
	2.670				104.735	1.403	14000
		2.670					
2.475			0.195	2.007			
	1.270				105.940	2.608	13800
		1.400					
2.210			-0.730	1.277			
	2.250				105.690	2.358	13600

Date 18/12/82 Levels taken for L 18000 N 194

2090

From 13400E To 12200 E

BACK SIGHT	INTER-MEDIATE	FORE SIGHT	~~RISE~~ FS-BS	FALL	REDUCED LEVEL	DISTANCE	CROSS SECTION LEFT	CROSS SECTION RIGHT	REMARKS
	2.040				105.900	2.568			18000N, 13400E
		2.040							
4.780			-2.740	-1.463					
	1935				108.745	5.413			13200
		0.200							
3.965			-3.765	-5.228					
	1.665				112.780	9.448			13000
		0.540							
2.890			-2.350	-7.578					
	2.525				114.270	10.938			12800
		1.070							
3.300			-2.230	-9.808					
	1.152				117.873	14.541			12600
		0.540							
3.625									
		0.680							
2.255			-4.66	-14.468					
	1.610				122.075	18.743			12400
		0.422							
1.860			-1.438	-15.906					
	3.500				121.623	18.291			12200
		3.500							

Date 18/2/82 Levels taken for L18000N

From 12000 E To 11000E

BACK SIGHT	INTER-MEDIATE	FORE SIGHT	~~RISE~~ FS–BS	FALL	REDUCED LEVEL	DISTANCE	CROSS SECTION LEFT	CROSS SECTION RIGHT	REMARKS
2.090			1.410	-14.496					
	1.990				121.723	18.391			18000N, 12000E
		1.990							
1.170									
		3.670							
2.010			2.480	-12.016					
	2.100				119.133	15.801			11800E
		0.120							
2.815			-2.155	-14.171					
	1.543				121.845	18.513			11600
		0.915							
1.890			-0.915	-15.086					
	2.555				121.748	18.416			11400
		3.495							
0.413			3.082	-12.004					
	2.490				118.731	15.399			11200
		4.110							
1.000			3.110	-8.894					
	1.080				117.031	13.699			11000
		1.080							
1.705									
		1.755							

Date 18/2/82 Levels taken for L20000.N

From 11000E To 11600E

BACK SIGHT	INTER-MEDIATE	FORE SIGHT	RISE	FALL	REDUCED LEVEL	DISTANCE	CROSS SECTION LEFT	CROSS SECTION RIGHT	REMARKS
0.810									
		2.930							
1.115									
		2.840							
0.810									
		1.470							
2.300									
		1.600							
1.700									
		3.235							
1.390									
		3.070							
1.525			6.565	-2.329					
	1.770				109.776	6.444			20000N, 11000E
	1.700				109.846	6.514			11200
		0.115							
3.690									
		0.637							
3.470			-6.408	-8.737					
	2.997				114.957	11.625			11400
	0.838				117.116	13.784			11600
		1.640							

Date 18/2/82 Levels taken for L20000

From 11800E To 13400E

BACK SIGHT	INTER-MEDIATE	FORE SIGHT	RISE	FALL	REDUCED LEVEL	DISTANCE	CROSS SECTION LEFT	CROSS SECTION RIGHT	REMARKS
2.750			-1.110	-9.847					
	1.418				117.646	14.314			11800E
	3.760				115.304	11.972			12000
		3.760							
4.895			-1.135	-10.982					
	0.720				119.279	15.947			12200
		0.610							
1.190			-0.580	-11.562					
	1.280				119.499	16.167			12400
	1.440				119.339	16.007			12600
		1.440							
1.440			0.000	-11.562					
	1.300				119.479	16.147			12800
		1.555							
1.180			0.375	-11.187					
	1.345				119.059	15.727			13000
	2.320				118.084	14.752			13200
		2.320							
0.860			1.460	-9.727					
	1.840				117.104	13.772			13400
		1.840							
1.280			0.560	-9.167					

Date 18/2/82 Levels taken for L20000N

From 13600E To 15000E

BACK SIGHT	INTERMEDIATE	FORE SIGHT	RISE	FALL	REDUCED LEVEL	DISTANCE	CROSS SECTION LEFT	CROSS SECTION RIGHT	REMARKS
	4.310				114.074	10.742			20000N, 13600E
		4.310							
0.035			4.275	-4.892					
	1.690				112.419	9.087			13800
		1.690							
0.930			0.760	-4.132					
	1.637				111.712	8.380			14000
		1.637							
1.275			0.362	-3.770					
	1.365				111.622	8.290			14200
		1.365							
1.575			-0.210	-3.980					
	1.720				111.477	8.145			14400
		1.720							
1.440			0.280	-3.700					
	1.780				111.137	7.805			14600
		1.780							
1.380			0.400	-3.300					
	2.650				109.867	6.535			14800
		2.650							
1.220			1.430	-1.870					
		2.195			108.892	5.560			15000

LOOP CLOSURE = 4.1 cm

Date 19/2/82 Levels taken for L16000N

From 15000E To 14200E

BACK SIGHT	INTERMEDIATE	FORE SIGHT	RISE	FALL	REDUCED LEVEL	DISTANCE	CROSS SECTION LEFT	CROSS SECTION RIGHT	REMARKS
2.113					111.474	8.142			16000N, 15000E
		0.625							
2.465			-1.840	-1.840					
	1.663				113.764	10.432			14800
		1.800							
1.543			0.257	-1.583					
	1.300				113.870	10.538			14600
		0.760							
1.940									
		0.773							
1.483			-1.690	-3.273					
	1.308				115.552	12.220			14400
		1.308							
1.733									
		1.183							
1.276									
		0.750							
2.496			-2.264	-5.537					
	2.024				117.100	13.768			14200
		0.327							
2.156									
		3.940							

Date 19/2/82 Levels taken for L16000

From 14000E To 12800E

BACK SIGHT	INTER-MEDIATE	FORE SIGHT	RISE	FALL	REDUCED LEVEL	DISTANCE	CROSS SECTION LEFT	CROSS SECTION RIGHT	REMARKS
0.327			1.784	-3.753					
	2.650				114.690	11.358			16000N, 14000E
		3.230							
1.525									
		0.570							
1.830			0.445	-3.308					
	1.980				114.915	11.553			13800
	0.100				116.795	13.463			13600
		0.100							
2.810			-2.710	-6.018					
	1.291				118.308	14.976			13400
		0.505							
3.100			-2.595	-8.613					
	1.675				120.525	17.193			13200
		0.798							
3.275			-2.437	-11.050					
	1.620				123.017	20.193			13000
		0.155							
4.230									
		0.566							
4.840			-8.349	-19.399					
	3.810				129.176	25.844			12800

Date 19/2/82 Levels taken for L16000 N

From 12600 E To 11600E

BACK SIGHT	INTER-MEDIATE	FORE SIGHT	RISE	FALL	REDUCED LEVEL	DISTANCE	CROSS SECTION LEFT	CROSS SECTION RIGHT	REMARKS
		0.212							
4.790			-4.578	-23.977					
	2.331				135.233	31.901			12600
		0.630							
2.176									
		4.120							
1.000			1.574	-22.403					
	2.130				133.860	30.528			12400
		0.415							
4.050			-3.635	-26.038					
	2.785				136.840	33.508			12200
		0.895							
1.757			-0.862	-26.900					
	1.744				138.743	35.411			12000
		0.390							
1.900			-1.510	-28.410					
	2.730				139.267	35.935			11800
		2.614							
0959			1.655	-26.755	138.992				
	1.420				~~138.702~~	35.660			11600
		2.240							
2.176									

Date 19/2/82 Levels taken for L16000N

From 11400E To 10400E

BACK SIGHT	INTER-MEDIATE	FORE SIGHT	RISE	FALL	REDUCED LEVEL	DISTANCE	CROSS SECTION LEFT	CROSS SECTION RIGHT	REMARKS
		0.680							
0.504			0.240	-26.515					
	3.212				136.890	33.558			16000N, 11400E
		4.055							
0.220									
		2.845							
1.220			5.460	-21.055					
	1.229				133.413	30.081			11200E
		3.590							
0.300			3.290	-17.765					
	1.847				129.505	26.173			11000
		2.140							
1.245									
		1.260							
1.240			0.915	-16.850					
	1.550				128.887	25.555			10800
	2.780				127.657	24.325			10600
		2.780							
1.346									
		1.695							
0.480			2.649	-14.201					
	1.295				126.493	23.161			10400

Date 19/2/82 Levels taken for L16000N

From 10200E To 10000E

BACK SIGHT	INTER-MEDIATE	FORE SIGHT	RISE	FALL	REDUCED LEVEL	DISTANCE	CROSS SECTION LEFT	CROSS SECTION RIGHT	REMARKS
	2.100				125.688	22.356			16000N, 10200E
		2.100							
0.490			1610 -	12.591					
	1.505				124.673	21.341			10000E
		1975							
1.230									
		1930							
0.730									
		2.170							
0.450									
		2.055							
1.445									CROSSOVER TO L18000N
		1.820							
0.550									
		1.860							
1.010									
		1.520							
1.610									
		2.260							
0.615						→ 13.816			
		1.020							
2.135			6.835 −	5.756	117.148	FS 2.195			13000N, 11,000E

Date 19/2/82 Levels taken for GRAVITY BASE

From 20000N, 14400E To BOPEECHEE

BACK SIGHT	INTER-MEDIATE	FORE SIGHT	RISE	FALL	REDUCED LEVEL	DISTANCE A.L.W.r.t. [illegible]	CROSS SECTION LEFT	CROSS SECTION RIGHT	REMARKS
1.520					111.477	8.145			20000N, 14400E
		1.310							
1.680									
		1.300							
1.635			-0.705	-0.705					
	0.970				112.732	9.400			BOPEECHEE
		1.615							
1.315									
		1.675							
1.290			0.685	-0.02					
		1.545			111.472	8.140			20000N, 14400E

LOOP CLOSURE = 0.5cm

Date 19/2/82 Levels taken for L 20000 N

From 15000 E To 16000 E

BACK SIGHT	INTER-MEDIATE	FORE SIGHT	~~RISE~~ FS-BS	FALL	REDUCED LEVEL	DISTANCE	CROSS SECTION LEFT	CROSS SECTION RIGHT	REMARKS
2·665					108 892	5·560			20000 N, 15000 E
	0·755				110·802	7·470			15200 E
		0·755							
0·780			-0·025	-0·025					
	2·090				109·492	6·160			15400 E
		2·090							
0·800									
		3·920							
0·271			4·939	4·914					
	1·508				105·135	1·803			15600
		4·915							
0·654			4·261	9·175					
	2·580				99·802	-3·53			15800
		1·590							
0·342			1·248	10·423					
	1·935				99·199	-4·133			16000
		1·935							

CONTINUED 20/2

Date 20/2/92 Levels taken for L20000N

From 16000E To 17600E

BACK SIGHT	INTERMEDIATE	FORE SIGHT	~~RISE~~ FS-BS	FALL	REDUCED LEVEL	DISTANCE	CROSS SECTION LEFT	CROSS SECTION RIGHT	REMARKS
0.830					99.199	-4.133			20000N, 16000E:
		1.045							
4.035			-1.885	8.538					
	2.800				100.219	-3.113			16200
		1.820							
4.120			-2.300	6.238					
	4.220				101.099	-2.233			16400
	0.605				104.714	1.382			16600
		0.605							
1.685			-1.080	5.158					
	1.150				105.249	1.917			16800
		0.610							
2.190			-1.520	3.638					
	1.456				106.463	3.131			17000
	0.610				107.309	3.977			17200
		0.610							
1.355			-0.745	2.893					
	1.480				107.184	3.852			17400
		2.000							
2.330			-0.330	2.563					
	1.892				107.102	3.770			17600
		0.178							

Date 20/2/82 Levels taken for L20000

From 17800 E To 18800

BACK SIGHT	INTER-MEDIATE	FORE SIGHT	~~RISE~~ FS-BS	FALL	REDUCED LEVEL	DISTANCE	CROSS SECTION LEFT	CROSS SECTION RIGHT	REMARKS
3.820			-3.642	-1.079					
	1.166				111.470	8.138			17800
		0.650							
3.525									
		0.340							
2.870			-5.405	-6.484					
	2.090				115.951	12.619			18000
		0.310							
1.185			-0.875	-7.359					
	1.677				117.239	13.907			18200
		1.890							
1.713									
		4.457							
10.618			4.016	-3.343					
	1.858				113.042	9.710			18400
	3.350				111.550	8.218			18600
		3.350							
2.395			0.955	-2.388					
	2.080				111.865	8.533			18800
		2.080							
4.220									
		0.662							

Date 20/2/82 Levels taken for L 20000

From To 19000 E

BACK SIGHT	INTER-MEDIATE	FORE SIGHT	RISE	FALL	REDUCED LEVEL	DISTANCE	CROSS SECTION LEFT	CROSS SECTION RIGHT	REMARKS
4.216									
		0.300							
3.708			-9.102	-11.490					
	1.521				121.526	18.194			19000
		4.210							
0.316									
		4.910							
2.238									
		1.860							
0.820									
		1.580							
0.990									
		1.200							

CONTINUED 21/2

CROSSING TO L 18000

Date 21/2/82 Levels taken for CROSSOVER

From To 20000N TO 18000N

BACK SIGHT	INTER-MEDIATE	FORE SIGHT	RISE	FALL	REDUCED LEVEL	DISTANCE	CROSS SECTION		REMARKS
							LEFT	RIGHT	
3.910									
		0.244							
3.215									
		0.137							
1.075									
		3.632							
0.653									
		4.240							
0.390									
		2.525							
0.637									
		4.430							
0.584									
		3.260							
0.170									
		4.140							
1.075									
		0.365							
1.280									
		2.125							
2.310									
		0.200							

Date 21/2/82 Levels taken for L18000N

From 16800E To 17400E

BACK SIGHT	INTER-MEDIATE	FORE SIGHT	FS-BS	FALL	REDUCED LEVEL	DISTANCE	CROSS SECTION LEFT	CROSS SECTION RIGHT	REMARKS
4.854									
		0.556							
3.981			11.710	0.220					
	2.700				108.637	(108.631)	5.305		18000N, 16800E
		0.445							
4.655			-4.210	-3.990					
	2.695				112.852	(112.846)	9.520		17000E
		0.490							
4.930			-4.440	-8.430					
	3.725				116.262	(116.256)	12.930		17200
		0.574							
4.510									
		0.403							
4.237									
		0.628							
4.395									
		1.602							
1.880			-11.813	-20.243					
	1.290				130.510	(130.504)	27.178		17400
		4.729							
0.365									
		4.560							

Date 21/2/82 Levels taken for L/18000N

From 17600E To 18200E

BACK SIGHT	INTER-MEDIATE	FORE SIGHT	~~RISE~~ FS-BS	FALL	REDUCED LEVEL	DISTANCE	CROSS SECTION LEFT	CROSS SECTION RIGHT	REMARKS
0.779									
		4.158							
1.436									
		3.455							
2.100			12.222	-8.021					
	1.282				118.296	(-118.290)	14.964		17600
		0.317							
2.875			-2.558	-10.579					
	1.172				120.964	(120.958)	17.632		17800
		1.120							
2.890									
		0.470							
3.125			-4.425	-15.004					
	2.205				124.356	(124.350)	21.024		18000
		1.415							
0.691									
		4.808							
0.209			5.323	-9.681					
	4.375				116.863	(116.857)	13.531		18200
		4.375							
3.600									
		0.378							

Date 21/2/82 Levels taken for L18000N

From 18400E To 19000E

BACK SIGHT	INTER-MEDIATE	FORE SIGHT	~~RISE~~ FS-BS	FALL	REDUCED LEVEL	DISTANCE	CROSS SECTION LEFT	CROSS SECTION RIGHT	REMARKS
1.157			-0.004	-9.685					
	1967				119.275	(119.269)	15.943		18000N, 18400E
		4.428							
0.236									
		4.780							
0.262									
		3.550							
1.016			11.244	1.559					
	3.716				106.282	(106.276)	2.950		18600
		0.630							
2.250			-1.620	-0.061					
	2015				109.603	(109.597)	6.271		18800
		3.785							
1.145			2.640	2.579					
	3.005				105.973	(105.967)	2.641		19000
		0.170							
4.035									
		0.790							
1.257									
		1.300							
3.880									
		0.173							

Date 21/2/82 Levels taken for CROSSOVER

From L18000N To L16000N

BACK SIGHT	INTER-MEDIATE	FORE SIGHT	RISE	FALL	REDUCED LEVEL	DISTANCE	CROSS SECTION LEFT	CROSS SECTION RIGHT	REMARKS
4.080									
		1.910							
3.580									
		0.198							
4.380									
		0.430							
3.325									
		0.465							
4.480									
		0.334							
4.218									
		0.130							
1.185									
		4.540							
0.730									
		3.315							
1.700									
		4.440							
0.284			-18.939	-16.360					
		4.240			123.677	(123.671)		20.345	16000N, 17400E
0.504									
		4.305							17200E

Date 21/2/82 Levels taken for L18000N

From 15000E To 16800E

BACK SIGHT	INTER-MEDIATE	FORE SIGHT	~~RISE~~ FS-BS	FALL	REDUCED LEVEL	DISTANCE	CROSS SECTION LEFT	CROSS SECTION RIGHT	REMARKS
0.753					105.683	2.351			18000N, 15000E
	2.520				103.916	0.584			15200E
		2.520							
1.160			1.360	1.360					
	2.860				102.216	-0.416			15400
		4.930							
2.050			2.880	4.240					
	1.660				100.536	-2.796			15600
	1.405	~~1.405~~			100.791	-2.541			15800
		1.405							
1.571			-0.166	4.074					
	2.575				99.787	-3.645			16000
		1.500							
3.420			-1.920	2.154					
	2.757				101.525	-1.807			16200
	3.375				100.907	-2.425			16400
		3.375							
1.270			2.105	4.259					
	1.795				100.382	-2.950			16600
		0.060				5.299			
5.000						BS 1.843		BS 1.556	
		0.438	-7.546	-3.287	103.631	FS 0.355		FS 1.092	16800E

Date 22/2/82 Levels taken for L 24000N

From 15000E To 13400E

BACK SIGHT	INTER-MEDIATE	FORE SIGHT	~~RISE~~ FS-BS	FALL	REDUCED LEVEL	DISTANCE	CROSS SECTION LEFT	CROSS SECTION RIGHT	REMARKS
2·077					100·000	-3·332			24000N, 15000E
		1·834							
2·335			-0·501	-0·501					
	2·373				100·205	-3·127			14800
		1·887							
1·875			0·012	-0·489					
	1·745				100·821	-2·511			14600
		1·620							
1·250			0·370	-0·119					
	1·320				100·876	-2·456			14410
		0·605							
1·630			-1·025	-1·144					
	1·405				101·816	-1·516			14200
	1·030				102·191	-1·141			14000
		1·030							
1·480			-0·450	-1·594					
	1·615				102·056	-1·276			13800
		1·615							
1·645			-0·030	-1·624					
	1·474				102·227	-1·105			13600
	1·600				102·101	-1·231			13400
		1·600							

Date 22/2/82 Levels taken for L24000N

From 13200E To 11600E

BACK SIGHT	INTER-MEDIATE	FORE SIGHT	~~RISE~~ FS-BS	FALL	REDUCED LEVEL	DISTANCE	CROSS SECTION LEFT	CROSS SECTION RIGHT	REMARKS
1.970			-0.370	-1.994					
	2.165				101.906	-1.426			24000N, 13200E
		2.040							
1.475			0.565	-1.429					
	1.655				101.851	-1.481			13000
		1.040							
1.777			-0.737	-2.166					
	1.413				102.780	-0.552			12800
	1.670				102.573	-0.759			12600
		1.670							
2.155			-0.485	-2.651					
	1.402				103.326	-0.006			12400
	0.990				103.738	0.406			12200
		0.990							
1.955			-0.965	-3.616					
	1.633				104.060	0.728			12000
		0.085							
1.455			-1.370	-4.986					
	1.360				105.703	2.371			11800
	1.060				106.003	2.671			11600
		0.505							
2.250			-1.745	-6.731					

Date 22/2/82 Levels taken for L24000N

From 11400E To 11000E

BACK SIGHT	INTER-MEDIATE	FORE SIGHT	~~RISE~~ FS-BS	FALL	REDUCED LEVEL	DISTANCE	CROSS SECTION LEFT	CROSS SECTION RIGHT	REMARKS
	1.645				107.163	3.831			24000N, 11400E
	1.400	1.			107.408	4.076			11200
		1.400							
1.330			0.070	-6.661					
	1.080				107.658	4.326			11000
		1.395							
1.945									
		3.815							
3.075									
		3.060							
1.490									
		1.440							
2.020									
		0.925							
1.710									
		1.580							
2.255									
		0.730							
1.760									
		1.745							
1.292									(1.492?)
		3.220							

CROSSING TO L20000

Date 22/2/82 Levels taken for CROSSOVER

From L 24000 N To L 20000 N

BACK SIGHT	INTER-MEDIATE	FORE SIGHT	RISE	FALL	REDUCED LEVEL	DISTANCE	CROSS SECTION LEFT	CROSS SECTION RIGHT	REMARKS
1.440									
		1.610							
1.980									
		0.890							
1.500									
		1.340							
0.885									
		1.385							
2.680									
		1.435							
2.500									
		1.300							
1.643									
			−2.305	−8.966					
		1.282			109.761	6.429			20000N, 11000E
					OK				

Date 22/12/82 Levels taken for L24000N

From 15000E To 16800E

BACK SIGHT	INTER-MEDIATE	FORE SIGHT	~~RISE~~ FS-BS	~~FALL~~	REDUCED LEVEL	DISTANCE	CROSS SECTION LEFT	CROSS SECTION RIGHT	REMARKS
3.300					100.000	-3.332			24000N, 15000E
	2.875				100.425	-2.907			15200E
		2.875							
1.435			1.440	1.440					
	1.605				100.255	-3.077			15400
		1.640							
1.670			-0.030	1.410					
	1.139				100.751	-2.581			15600
	1.585				100.305	-3.027			15800
		1.585							
3.755			-2.170	-0.760					
	1.300				102.760	-0.572			16000
		1.155							
1.390			-0.235	-0.995					
	1.270				103.025	-0.307			16200
	1.490				102.805	-0.527			16400
		1.545							
1.240			0.305	-0.690					
	1.237				102.753	-0.579			16600
	1.515				102.475	-0.857			16800
		1.720							
1.785			-0.065	-0.755					LEVEL LOOSE

Date 22/12/82 Levels taken for L24000N

From 17000E To 18600E

BACK SIGHT	INTER-MEDIATE	FORE SIGHT	~~RISE~~ FS-BS	FALL	REDUCED LEVEL	DISTANCE	CROSS SECTION LEFT	CROSS SECTION RIGHT	REMARKS
	1.287				102.768	-0.564			24000N 17000E
	3.490				100.565	-2.767			17200E
		3.490							
1.220			2.270	1.515					
	1.372				100.413	-2.919			17400
	1.475				100.310	-3.022			17600
		1.475							
1.670			-0.195	1.320					
	1.383				100.597	-2.736			17800
	2.030				99.950	-3.382			18000
		2.030							
0.080			1.950	3.270					
	1.381				98.649	-4.683			18200
	1.740				98.290	-5.042			18400
		1.740							
0.960			0.780	4.050					
	1.740				97.510	-5.822			18600
		1.740							
2.260			-0.520	3.530					
	2.322				97.448	-5.884			~~18800~~ INT
	~~2.495~~	2.495							
2.327			0.168	3.698					

Date 22/2/82 Levels taken for

From To

BACK SIGHT	INTER-MEDIATE	FORE SIGHT	RISE	FALL	REDUCED LEVEL	DISTANCE	CROSS SECTION LEFT	CROSS SECTION RIGHT	REMARKS
	4.232				95.370	-7.962			24000N, 19000E
		4.232			OK				

CONTINUED 23/2

Date 23/2/82 Levels taken for C 24000N

From To

BACK SIGHT	INTER-MEDIATE	FORE SIGHT	RISE	FALL	REDUCED LEVEL	DISTANCE	CROSS SECTION LEFT	CROSS SECTION RIGHT	REMARKS
4.365			-0.133	3.565					24000N, 19000E
		2.508							
2.560			-0.055	3.510					
	2.855				96.935	-6.397			18800
		2.210							
2.470									
		0.830							
2.545									
		1.060							
1.060									
		1.330							VERY WINDY
1.410									
		0.960							
3.280									
		1.610							
1.370									
		1.200							
1.470									
		1.210							
1.470									
		3.115							
2.715									

Date 23/2/82. Levels taken for L24000.

From To

BACK SIGHT	INTER-MEDIATE	FORE SIGHT	RISE	FALL	REDUCED LEVEL	DISTANCE	CROSS SECTION LEFT	CROSS SECTION RIGHT	REMARKS
		0.680							
1.680									
		1.645							
1.735									
		2.530							
0.954			-3.899	-0.389					
		3.646			100.043	-3.289			24000 N, 15000 E
					OK				

Date 23/2/82 Levels taken for BASELINE (15000E)

From ~~[illegible]~~ 20000N To 22500N

BACK SIGHT	INTERMEDIATE	FORE SIGHT	RISE	FALL	REDUCED LEVEL	DISTANCE	CROSS SECTION LEFT	CROSS SECTION RIGHT	REMARKS
3.470					108.892	5.560			15000E, 20000N
		2.220	~~1.250~~	(1.250)		2.22			
0.160			2.060	(2.060)					
	3.322	3.162		3.162	106.980	3.648			20500N
		0.970	0.072						
1.890			−0.920	(1.140)					
		4.580							
0.110			4.470	(5.610)	106.642				
	0.770				−105.982	2.650			21000
		2.790							
2.645			0.145	(5.755)					
	2.705				103.902	0.570			21500
		3.760							
1.315			1.945	7.700					
	0.775				103.887	0.555			22000
		0.775							
1.260									
		0.350							
1.275			−1.410	6.290					
	2.197				103.375	0.043			22500
		2.860							
3.455			−0.595	5.695					

Fall .85 | 102.892 | 1.732

Date 23/2/82 Levels 2.663 taken for BASELINE

From 23000 N To 24000N

BACK SIGHT	INTER-MEDIATE	FORE SIGHT	RISE	FALL	REDUCED LEVEL	DISTANCE	CROSS SECTION LEFT	CROSS SECTION RIGHT	REMARKS
	3.240				103.427	0.095			15000E, 23000N
		3.240	1.960						
1.300			1.8[illegible]						
		3.380							
0.590			4.73	10.425					
	1.508				100.429	-2.903			23500
		1.085							
1.330									
		1.440							
3.715			-2.528	7.897					
		4.465			100.000	-3.332			24000
					OK				

APPENDIX F

BASE STATION SPECIFICATIONS

BASE STATION SPECIFICATIONS

BASE STATION	LATITUDE	LONGITUDE	ELEVATION	OBSERVED GRAVITY	BOUGUER VALUE $d = 1.9gcm^{-3}$
77E4.1305	29.59485	137.3804E	9.40m	979282.42	-21.70

APPENDIX G

CALIBRATION TABLE FOR LACOSTE & ROMBERG, INC. MODEL G GRAVITY METER

#G 586

TABLE 1

MILLIGAL VALUES FOR LACOSTE & ROMBERG, INC. MODEL G GRAVITY METER #G-586

COUNTER READING*	VALUE IN MILLIGALS	FACTOR FOR INTERVAL	COUNTER READING*	VALUE IN MILLIGALS	FACTOR FOR INTERVAL
000	000.00	1.02727	3600	3697.90	1.02806
100	102.73	1.02711	3700	3800.70	1.02810
200	205.44	1.02696	3800	3903.51	1.02813
300	308.13	1.02686	3900	4006.32	1.02815
400	410.82	1.02679	4000	4109.14	1.02818
500	513.50	1.02676	4100	4211.96	1.02819
600	616.18	1.02672	4200	4314.78	1.02821
700	718.85	1.02671	4300	4417.60	1.02822
800	821.52	1.02671	4400	4520.42	1.02823
900	924.19	1.02673	4500	4623.24	1.02823
1000	1026.86	1.02675	4600	4726.07	1.02820
1100	1129.54	1.02677	4700	4828.89	1.02817
1200	1232.21	1.02680	4800	4931.70	1.02812
1300	1334.89	1.02682	4900	5034.51	1.02807
1400	1437.58	1.02686	5000	5137.32	1.02802
1500	1540.26	1.02690	5100	5240.12	1.02796
1600	1642.95	1.02694	5200	5342.92	1.02790
1700	1745.65	1.02699	5300	5445.71	1.02783
1800	1848.35	1.02703	5400	5548.49	1.02774
1900	1951.05	1.02708	5500	5651.27	1.02763
2000	2053.76	1.02713	5600	5754,03	1.02751
2100	2156,47	1.02720	5700	5856.78	1.02738
2200	2259.19	1.02724	5800	5959.52	1.02722
2300	2361.91	1.02731	5900	6062.24	1.02704
2400	2464.64	1.02736	6000	6164.94	1.02684
2500	2567.38	1.02741	6100	6267.63	1.02661
2600	2670.12	1.02748	6200	6370.29	1.02637
2700	2772.87	1.02755	6300	6472.93	1.02612
2800	2875.62	1.02763	6400	6575.54	1.02585
2900	2978.39	1.02770	6500	6678.12	1.02557
3000	3081.16	1.02775	6600	6780.68	1.02529
3100	3183,93	1.02781	6700	6883.21	1.02501
3200	3286.71	1.02788	6800	6985.71	1.02471
3300	3389.50	1.02793	6900	7088.18	1.02442
3400	3492.29	1.02798	7000	7190.62	
3500	3595.09	1.02803			

* Note: Right hand wheel on counter indicates approximately 0.1 milligal

THE SHELL COMPANY OF AUSTRALIA LIMITED

METALS DIVISION

FINNISS SPRINGS E.L. 1019

PROGRESS REPORT

FOR PERIOD ENDING 27TH OCTOBER 1982

AUTHORS: M.L. HIGGINS
D.P. BAILEY

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LIST OF APPENDICES

SUMMARY

This report details work done and results gained on exploration with E.L.1019 during the period 27th May, 1982 through to 27th October, 1982.

Geological mapping and photo-interpretation were completed, as was modelling of the Bopeechee Gravity data. Though not directly explaining the gravity anomaly, the geological assessment did highlight that an Olympic Dam style deposit is unlikely to occur in this geological setting.

A probable explanation for the gravity anomaly is an uplifted crystalline block which may have been juxtaposed by either fault block upthrust, tight anticlinal folding, or both mechanisms.

1.0 INTRODUCTION

Exploration Licence 1019 was granted for a period of one year from 29th July, 1982, in joint name to Central Coast Exploration N.L. and The Shell Company of Australia Limited. Details of the licence were gazetted on the 24th June, 1982.

The abovementioned exploration licence is a replacement for E.L.634 which expired on the 26th May, 1982. It is the subject of a joint venture between The Shell Company of Australia Limited and Central Coast Exploration N.L. with Shell acting as manager.

Previous Shell reports numbered 08.1120, 08.1123 and 08.1200 include details of exploration and results to date. Since there is a gap between the expiry date of E.L.634 (26th May, 1982) and the granting date of E.L.1019 (28th July, 1982), this report period is actually five months. Although serving as a report for the period ending 27th October 1982, the report was actually compiled at end of August since there is an obvious break point in the exploration programme at this time.

The location is shown in Figure 1.

2.0 CONCEPTS

As indicated in previous technical reports, the area is regarded as having potential for two styles of mineralisation.

The primary model is the Olympic Dam type copper-uranium-gold hematitic breccia deposit. The main attraction in this respect was the small vein filled Clare St. Dora copper mine and a very large regional gravity anomaly situated to the northwest of this.

Another secondary model was stratiform copper within the Callana Beds. This is considered low priority since no sizeable copper deposits are known within rocks of this (or any other) type within the Adelaide Geosyncline.

3.0 EXPLORATION PROGRESS

3.1 GEOLOGICAL MAPPING AND INTERPRETATION

3.1.1 Introduction

Both ground traverse mapping and aerial photograph interpretation have been used to compile the geological map of the licence area presented in Figures 2 to 5. A summary regional geological map is presented as Figure 6.

The aims of the regional mapping programme were as follows:-

- establish lithologies present within licence area .
- place the Adelaidean lithologies into stratigraphic units.
- collect rock chip samples for petrological and analytical evaluation.
- determine the structural/stratigraphic controls of mineralisation at the Clare St. Dora Mine.
- assess the overall geological setting in the vicinity of the Bopeechee gravity anomaly, especially any affinities with that observed at Olympic Dam.

Whilst photo-interpretation was completed over most of the area, ground traverses were restricted to that area between "Finniss Springs" and Alberrie Creek Siding and areas to the north. It was decided that evaluation of these areas would be sufficient to allow interpretation of the non-outcrop areas over the Bopeechee gravity anomaly.

3.1.2 Stratigraphy

The principal Adelaidean units are the Burra Group, Callana Beds and diapiric material (within the Callana Beds).

The Burra Group is represented by quartzose psammites and psammopelites with thin carbonate interbeds. Skillogalee Dolomite equivalents (as mapped by SADME) are well represented by calcareous varieties of the above siliciclastics, and tend to contain more (and thicker) carbonate interbeds. A thick quartzite unit observed along the western edge of the outcrop south of Bopeechee, may be Copley Quartzite.

The Callana Beds are dominated by dolomitic varieties including dolomite, dolomitic breccia and dolomitic pelites and psammopelites. Evidence of evaporitic textures (common within the Callana Beds) is proposed in thin section descriptions. (These are contained in Appendix I and field locations of samples shown on Figures 1 and 2.

The so-called diapric material mapped by SADME (and shown on Figure 6) may be mis-named. Field observation suggests that most of this is not breccia (as the name seems to imply) but is merely complexly folded and faulted Callana Beds. Some brecciation is present and is more common in the highly folded or faulted areas, especially axial plane zones and adjacent cross-fault zones.

....../4

3.1.3 Structure

The regional geological setting is shown in Figure 6. It is dominated structurally by prominent northwest trending faults, the most obvious being the major NORTHWEST FAULT which parallels the TORRENS HINGE ZONE. Other prominent faults having the same trend include the one 8 km to the northeast of the NORTHWEST FAULT and the smaller one between these two near Bopeechee. This latter one is seen in outcrop south of Bopeechee.

The northwest trending faults are strike slip faults with both sinistral and dextral movement and most probably significant vertical displacements. Apart from disruption of bedding by drag adjacent to these faults, the major deformation apparent within the Adelaidean sequence is variably open to tight, assymetric folding (with associated brecciation), mainly within the lower Callana Beds.

This folding within the Callana Beds is of uncertain origin but may be due to either one of the following mechanisms:-

(i) Diapiric activity, especially evident in the outcropping Callana Beds at the Clare St. Dora Mine (Dunn's Mine Limestone) as noted on the Curdimurka 1:250 000 Geology sheet. Idea proposed by SADME geologists.

(ii) Pervasive folding of Callana Beds during Willouran time, proposed by Burton Murrell in his thesis "Stratigraphy and Tectonics Across the Torrens Hinge Zone". He suggests that there are major unconformities between crystalline basement and Callana Beds, and Callana Beds and Burra Group. His mechanism for this folding is not all that clear but seems to revolve around syndepositional faulting and attendant folding within a rapidly subsiding basin.

(iii) Combination of large scale décollement (or intraformational) slump folding and brecciation during Willouran, and later brittle deformation associated with fault block upthrust. Idea proposed (and favoured) by Shell staff.

3.2 MINERALISATION

The only significant mineralisation observed is that at the Clare St.Dora Mine. Here copper carbonates occur as fracture and vug fill in brecciated Callana Bed dolomites. The mineralisation seems to be related to a very deformed zone. No obvious quartz veining is present, though there is some quartz addition to the mineralised breccia (sample 6624, Appendix I). Minor sulphides are observed in thin section but are not obvious on the surface.

This mineralisation is very small scale and structurally localized. It's genesis is, at earliest, diagenetic replacement, but is more probably due to later epigenetic processes, as there is no evidence of syngenetic style mineralisation anywhere else in the area.

......./5

3.3 ROCK CHIP GEOCHEMISTRY

A total of twelve composite rock chip samples were collected during mapping. Results are shown in Appendix II. These are additional to those previously collected and reported by C.C.E. For completeness, these sample results are also included in Appendix II and locations are shown on Figures 2 to 5.

As indicated in the results sheet, no significant base metal values emerged from these samples, even though preference was given to collection of ferruginous material. A somewhat elevated molybdenum value of 40 ppm in sample 6614 is not considered statistically significant.

3.4 GEOPHYSICS

The position of the regional gravity anomaly is shown in relation to the geology in Figure 6. A similar scale bouguer gravity map is presented in Figure 7. From this it is clear that the very steep gradient trending southeast from the western edge of the Bopeechee Anomaly is related to the major NORTHWEST FAULT. Regional aeromagnetics at the same scale is presented in Figure 8 and from this it is clear that the Bopeechee gravity anomaly is located on a featureless regional magnetic gradient.

An optically levelled gravity survey was completed over the grid shown on Figure 2. Station spacing was at 200 m intervals along lines 2 km apart. Data is included in Appendix III.

Modelling has been carried out on the Finniss Springs gravity data using the iterative programme GRAMOD.

Lines were modelled individually and a combination of all lines was modelled using three dimensional prisms.

Goods fits were obtained for all profiles (standard deviation <0.07). The modelling indicates a source 300 - 500 m thick with a density contrast of approximately 1.0.

The top of the source is shallowest (about 300 m) between 14 000N and 18 000N but appears to deepen (+ 500 m) to the north and south. (See Figure 9).

The source is over 12 km long and approximately 4 km wide. The north-east and southwest extension of the gravity anomaly has not been defined by the gravity survey, as shown on Figure 10.

The gravity data and modelling indicates a source which is consistent with an Olympic Dam type body in terms of:

orientation (northwest)
max gravity anomaly (10 milligal)
density contrast (1.0)
thickness (300 - 500 m)
width (4 km)
depth to top (300 m min.)

....../6

It should be stated however that the principal target in this area is an Olympic Dam type deposit so modelling of data was done accordingly, using a three dimensional prism programme.

Alternative modelling could be done, for example, using a vertically continuous falut block model with much lower denisty contrast.

An over-riding consideration in assessing the relevance of such gravity modelling is to first evaluate the geological setting of the gravity anomaly. As has already been shown, the geology within the area is totally dissimilar to that at Olympic Dam.

4.0 DISCUSSION OF RESULTS

The programme has been oriented towards evaluation of a pronounced regional gravity anomaly called the BOPEECHEE ANOMALY, and its likely affinities with an Olympic Dam-type mineralised source.

The geological criteria established by mapping and photo-interpretation indicate the following:-

- principal Adelaidean rock units present are the Willouran Callana Beds and the Torrensian Burra Group.

- these are juxtaposed by intense strike-slip faulting into structural contact, but no stratigraphic (or unconformable) relationships are clearly evident.

- the major NORTHWEST FAULT passes through the area, just to the west of the Bopeechee Gravity Anomaly.

- attendant parallel (and possibly splay-) strike slip faults occur to the northeast of this major fault. One prominent fault probably trends along the northern edge of the Bopeechee Gravity Anomaly (See Figure 6).

- though only reaching lower greenschist facies metamorphism, the style of deformation implied by folding and brecciation, especially within the Callana Beds, indicates considerable tectonic activity in a rapidly subsiding basin, both during and well after deposition.

- major block faulting is one result of this deformation.

- copper mineralisation observed at the Clare St. Dora Mine is very local and structurally controlled.

In an attempt to explain the Bopeechee Gravity Anomaly using the above information, a hypothetical cross-section is presented as Figure 11. Since there is no pre-Mesozoic exposure in the area of the Bopeechee anomaly, it is not clear whether or not Callana Beds reach the surface here or not. However, since they crop out along strike to the south, this is a reasonable intepretation.

The gravity anomaly is interpreted to be sourced by uplifted, dense crystalline basement (pre-Adelaidean). The mechanism for this uplift may be due to either
(i) block faulting, or
(ii) anticlinal folding and uplift, or both.

Since Burra Group rocks occur either side of the Bopeechee anomaly and dip steep east in both cases, if Callana Beds do occur central to the anomaly, there maybe an overturned anticlinal axis trending directly through this area. In this case underlying crystalline basement may have been structurally elevated to a near surface position.

The alternative situation would arise by complicated block faulting at the active margin of a rapidly subsiding sedimentary basin. A localised fault wedge of crystalline basement may have been upthrust into a higher structural position thereby causing a contrast in densitites with surrounding siliciclastics.

The established geological setting and interpretation of the gravity anomaly do not fit well with the possible development in the area of an Olympic Dam type mineralised deposit.

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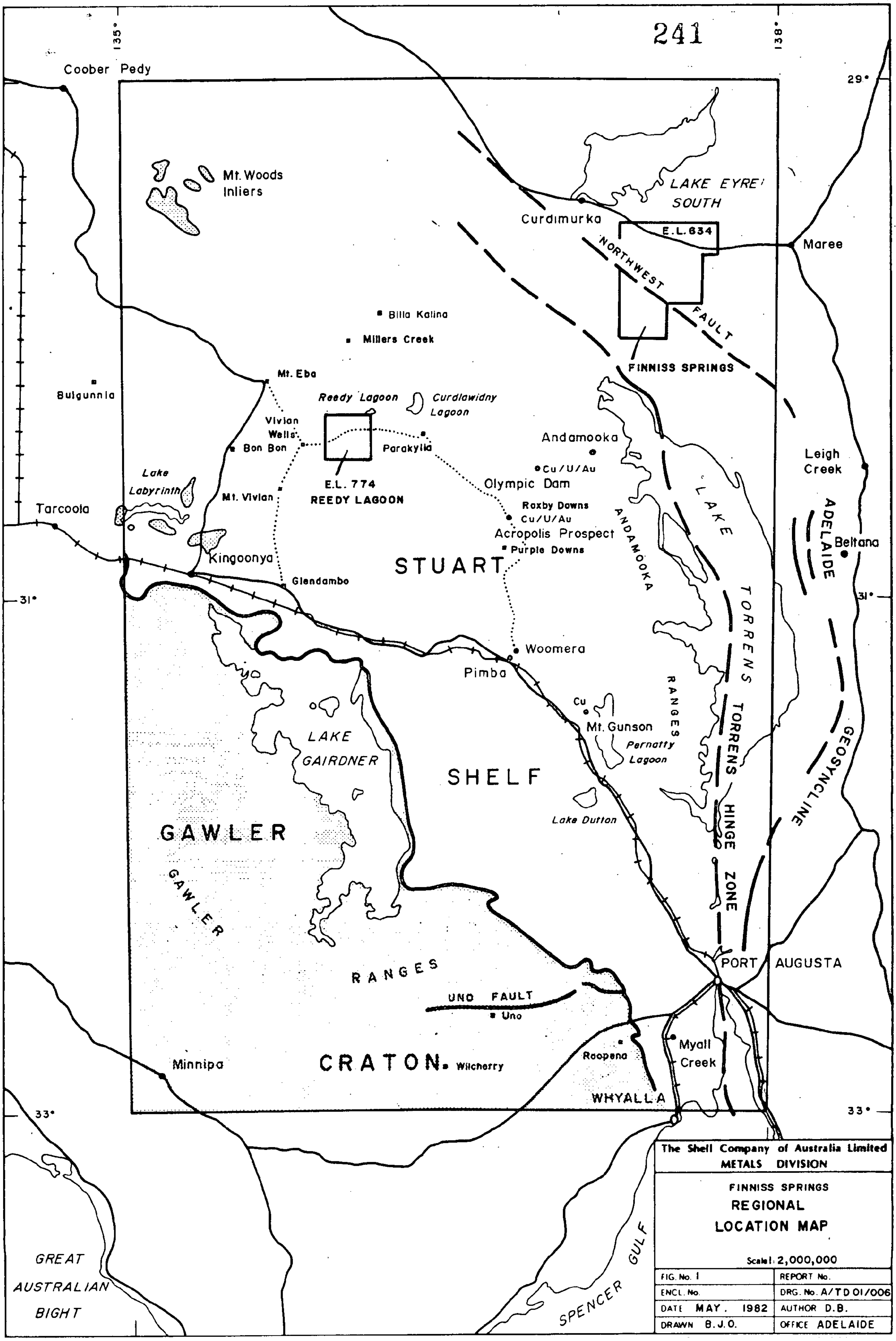
5.0 KEYWORDS

Central Coast Exploration, Olympic Dam, Callana Beds, Northwest Fault, Clare St. Dora Mine, Burra Group, Gramod, Bopeechee.

6.0 EXPENDITURE

~~Estimated~~ Expenditure for the period 1 June 1982 - 31 ~~August~~ 1982 is detailed below. 20.9.82

Personnel/Personnel Burden	10 867	7,566
Concession Payments	2 543	1,271
Aerial Photography	1 262	
Analysis/Assays	596	-244
Overheads	1 529	860
	$ 16 797	$11,933

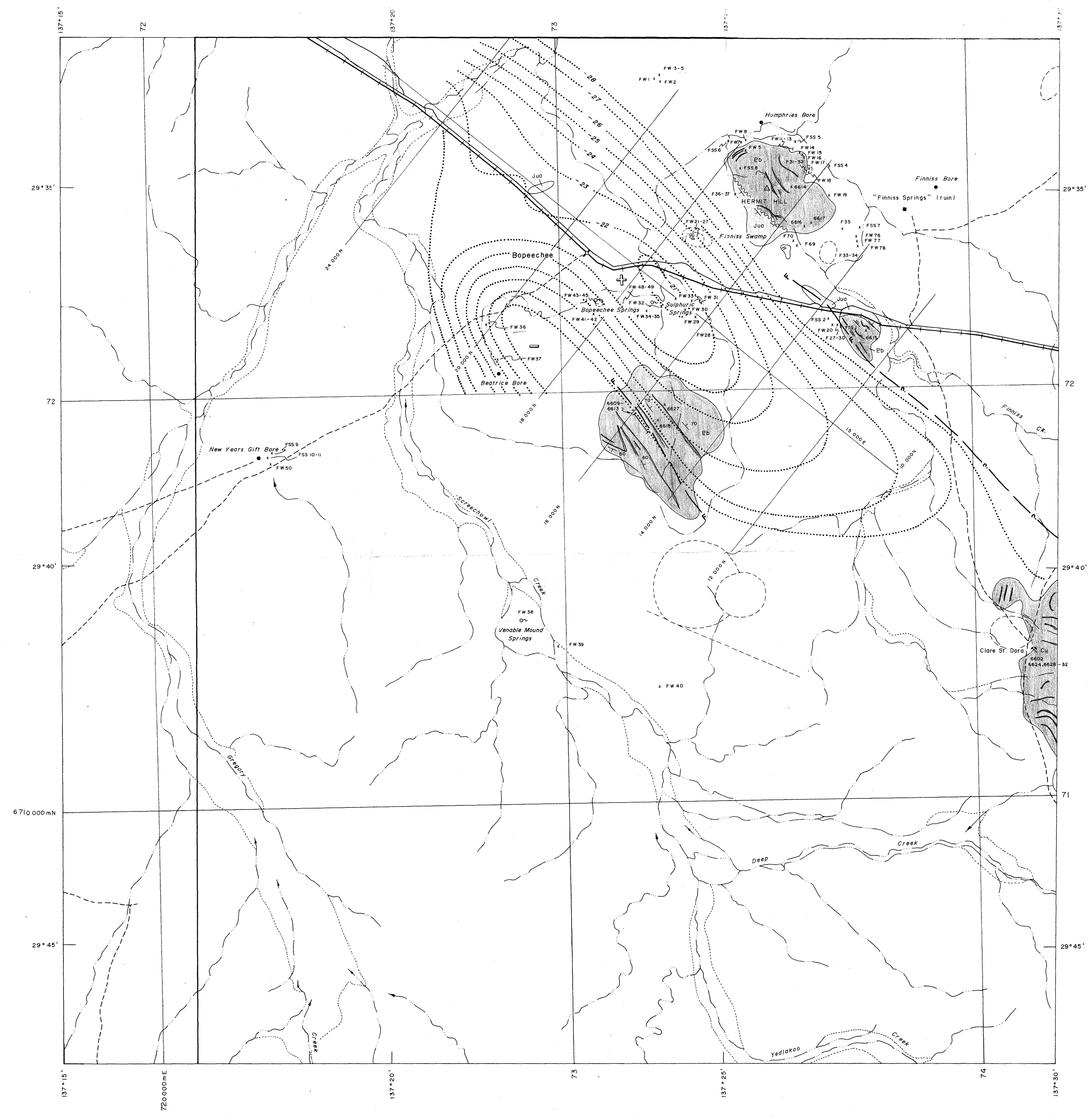


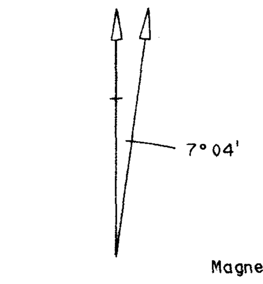
The Shell Company of Australia Limited
METALS DIVISION

FINNISS SPRINGS
REGIONAL
LOCATION MAP

Scale 1: 2,000,000

FIG. No. 1	REPORT No.
ENCL. No.	DRG. No. A/TD 01/006
DATE MAY. 1982	AUTHOR D.B.
DRAWN B.J.O.	OFFICE ADELAIDE





Magnetic value was taken from Curdimurka 1:250 000 sheet and is correct for 1982. Annual change is 02' easterly.

LEGEND

JURASSIC		Jua	Algebuckina sandstone
ADELAIDEAN WARRINA SUPERGROUP	TORRENSIAN	Eb	Burra Group
	WILLOURAN	Ec	Callana Group

Gravity contours

Photo features

Fault

Anticlines

Synclines

Outcrop boundary

Bedding trends

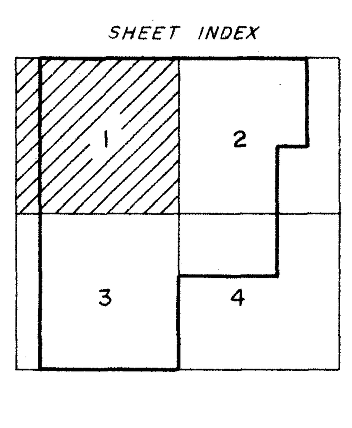
Dips: steep (photo), moderate, shallow

x FW 41 — Water sample (C.C.E.)

x F 27 — Rock chip sample (C.C.E.)

x FSS 7 — Stream Sediment sample (C.C.E.)

x 6602 — Rock chip sample (Shell)



0 1 2 3 KM

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SOUTH AUSTRALIA

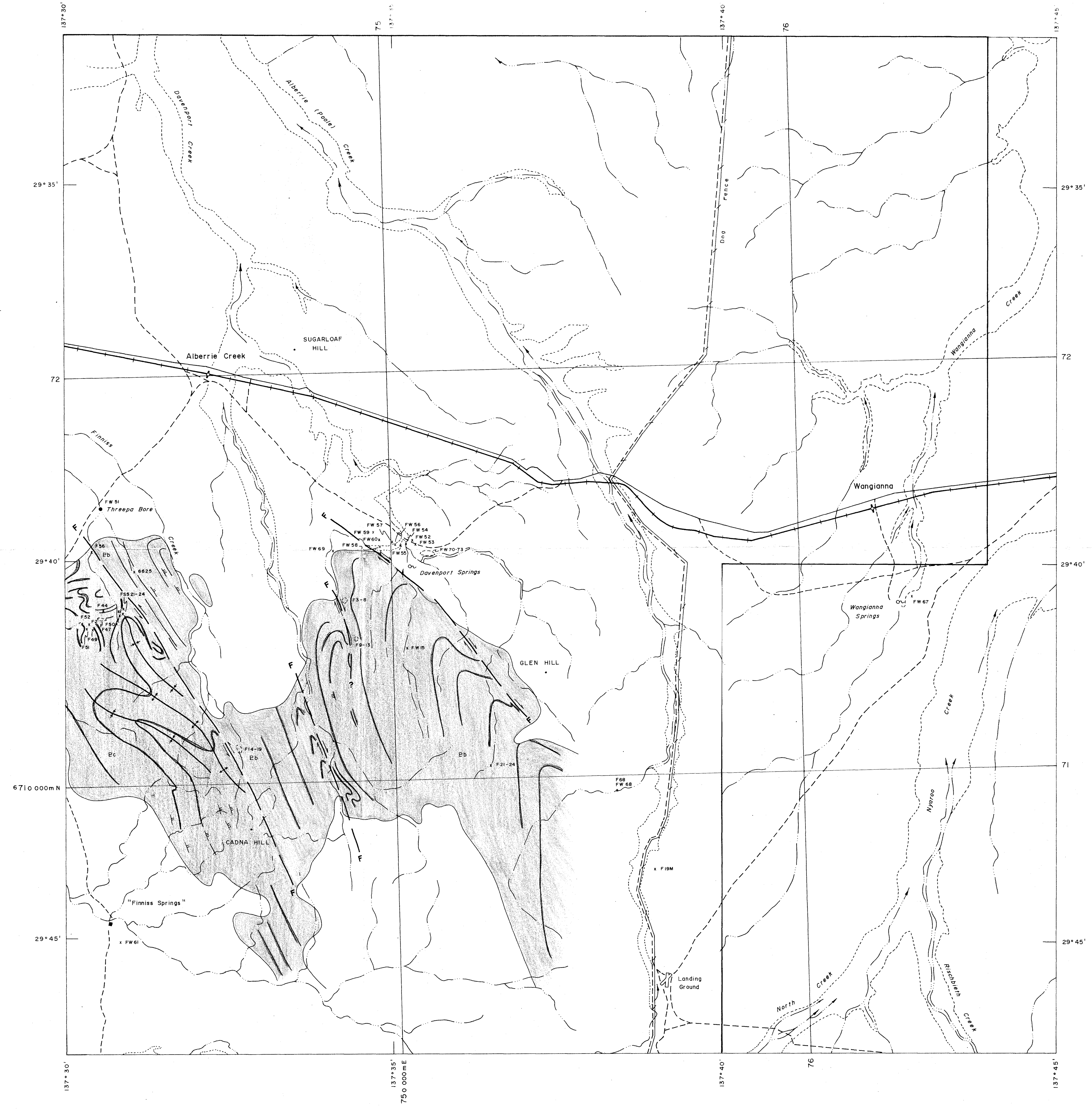
FINNISS SPRINGS

Regional Geology (Sheet 1)

Scale 1:50 000

REVISED:	REPORT No.
FIG. No. 2	DRG. No. A/TD 01/015
DATE AUG. 1982	AUTHOR D.P.B.
DRAWN B. OTTE	OFFICE ADELAIDE.

3914-3



TN MN

7°04'

Magnetic value was taken from Curdimurka 1:250 000 sheet and is correct for 1982. Annual change is 02' easterly.

LEGEND

JURASSIC — Jua — Algebuckina sandstone

ADELAIDEAN WARRINA SUPERGROUP — TORRENSIAN — Ɽb — Burra Group

ADELAIDEAN WARRINA SUPERGROUP — WILLOURAN — Ɽc — Callana Group

Photo features

Fault

Anticlines

Synclines

Outcrop boundary

Bedding trends

Dips — steep (photo), moderate, shallow

x FW15 — Water sample (C.C.E.)

x F9 — Rock chip sample (C.C.E.)

x FSS21 — Stream Sediment sample (C.C.E.)

x 6625 — Rock chip sample (Shell)

SHEET INDEX

1 2 3 4

0 1 2 3 KM

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METALS DIVISION

SOUTH AUSTRALIA

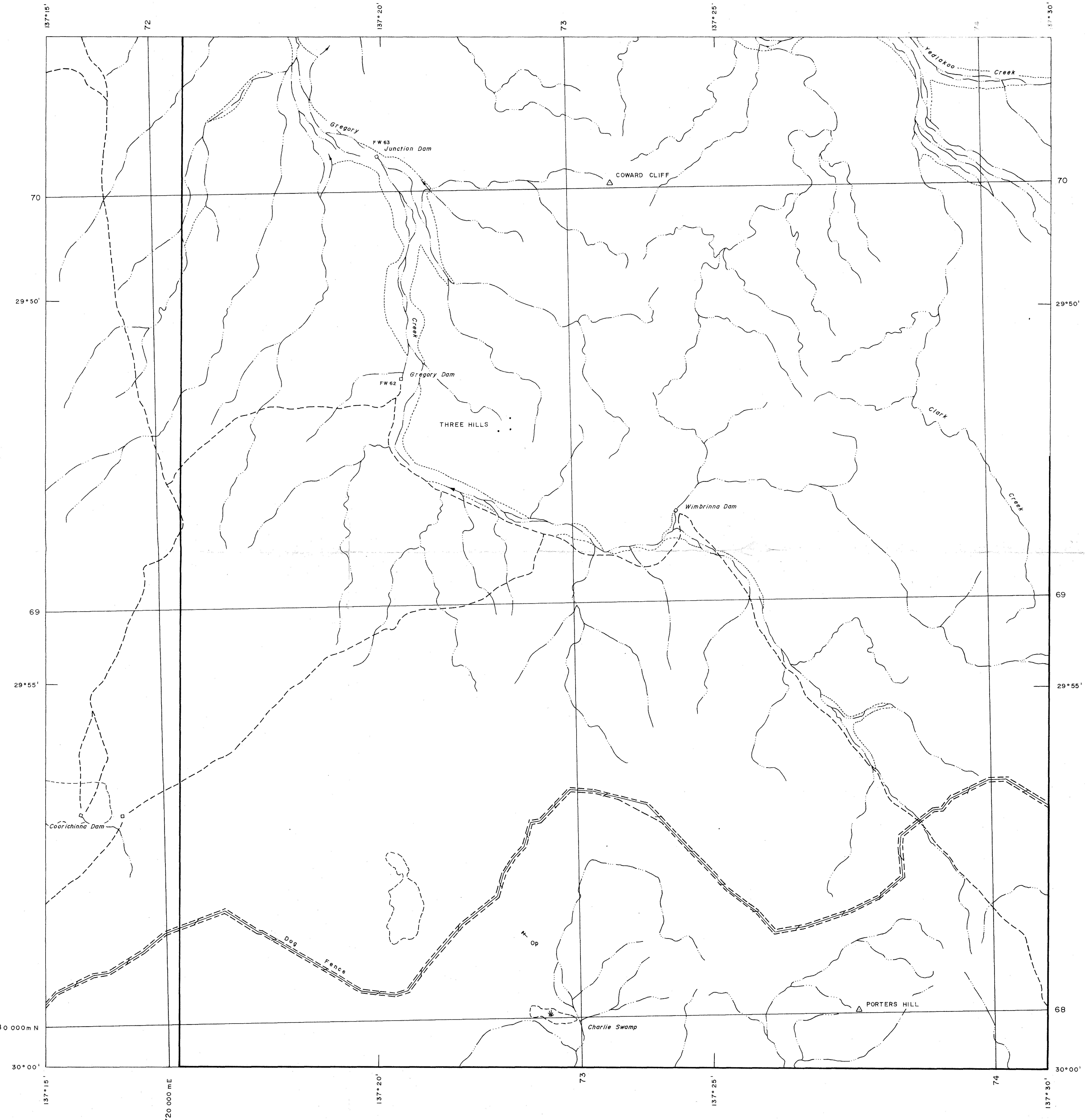
FINNISS SPRINGS

Regional Geology
(Sheet 2)

Scale 1 : 50 000

REVISED	REPORT No.
FIG. No. 3	DRG. No. A/TD 01/016
DATE AUG. 1982	AUTHOR D.P.B.
DRAWN B.OTTE	OFFICE ADELAIDE

3914-4



TN MN
7°04'

Magnetic value was taken from Curdimurka 1:250 000 sheet and is correct for 1982.
Annual change is 02' easterly.

x FW 63 Water sample (C.C.E.)

SHEET INDEX

1	2
3	4

0 1 2 3 KM

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METALS DIVISION

SOUTH AUSTRALIA

FINNISS SPRINGS

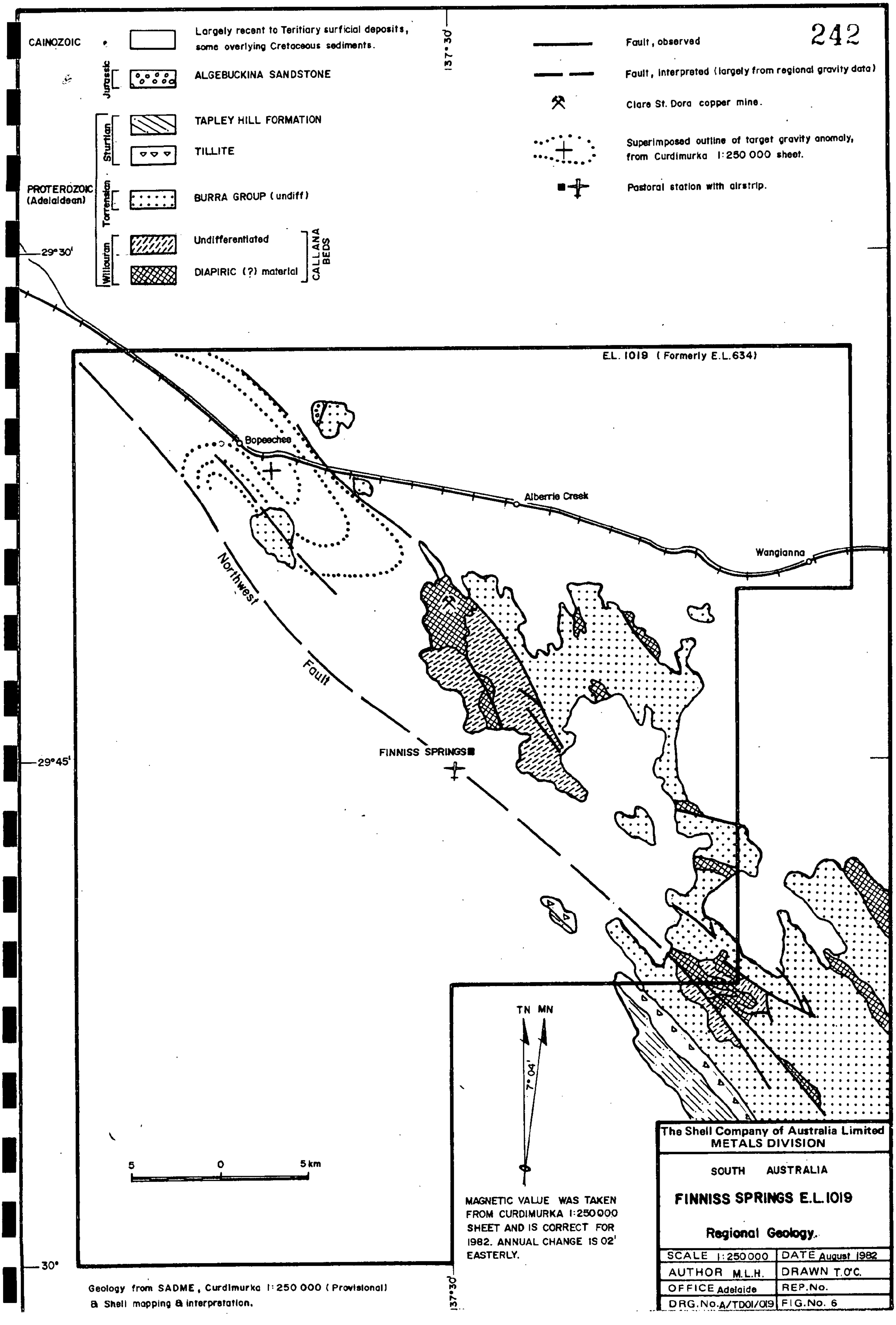
Regional Geology (Sheet 3)

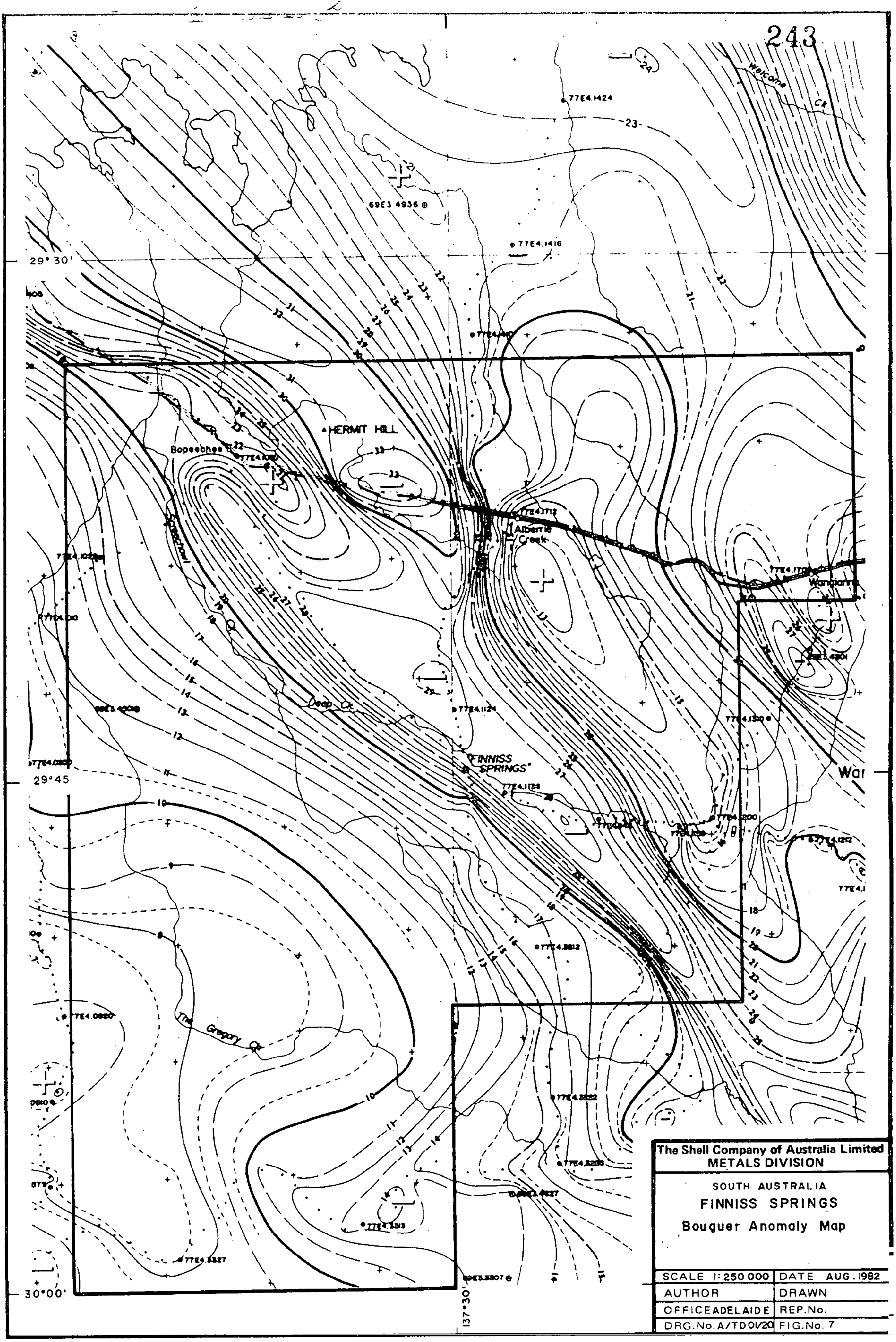
Scale 1:50 000

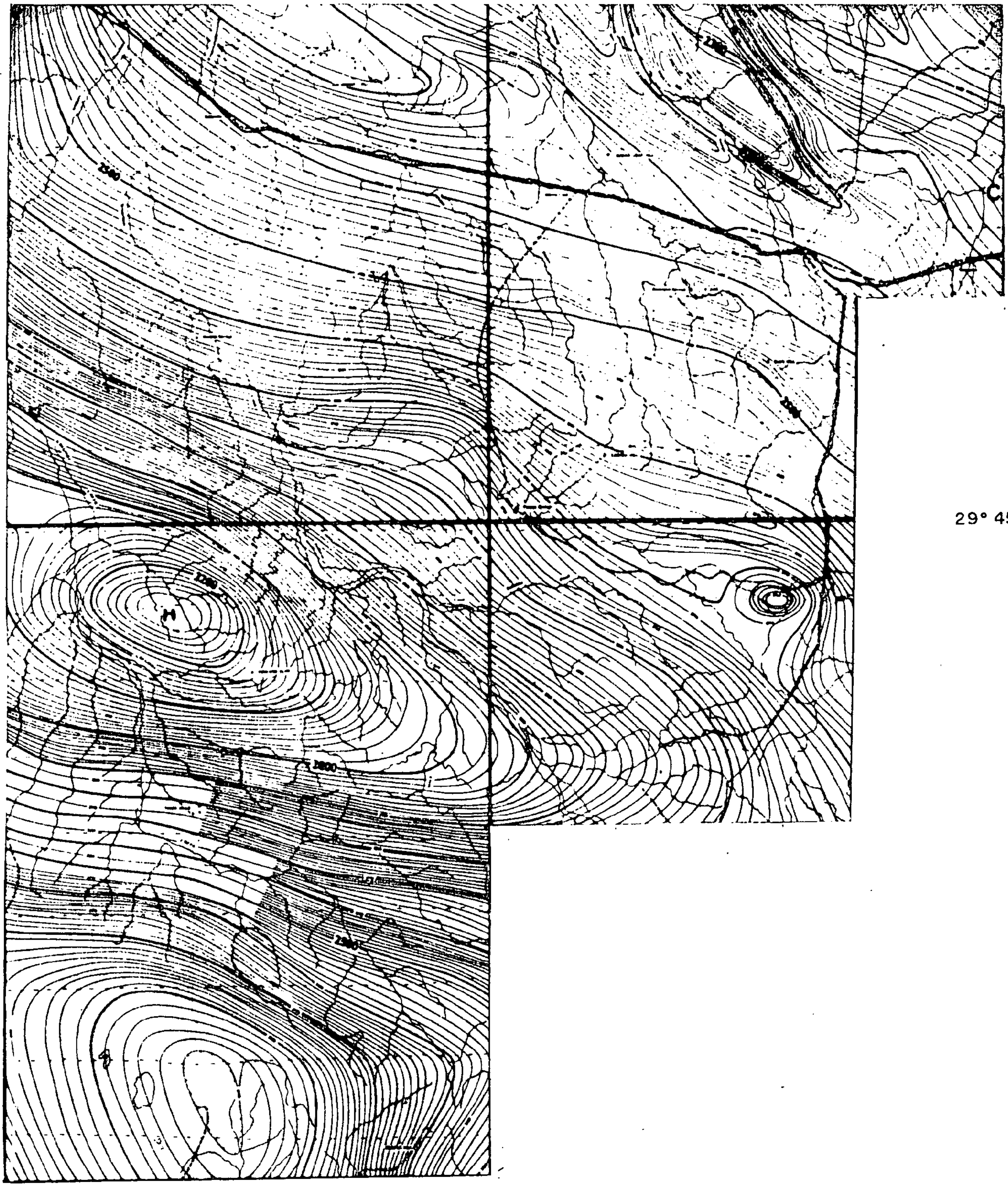
REVISED:	REPORT No.
FIG. No. 4	DRG. No. A/TD 01/017
DATE AUG. 1982	AUTHOR D.P.B.
DRAWN B. OTTE	OFFICE ADELAIDE

3914-5

137°30'
137°35'
75
137°40'
76
137°45'
70
69
68
29°50'
29°55'
30°00'
6680 000mN
750 000mE
x F25
x F26
Cockatoo Bore
F61-63
North Creek
Rischbieth Ck
Rischbieth Well
Au
Dog Fence
BLACK KNOB
Roses
HIGH HILL
ROCKY POINT
Netting Bore
Apollo No. 1
Vermin Proof Fence
West Mount Creek
MT. NORWEST
Top Mount Well
TN MN
7°04'
Magnetic value was taken from Curdimurka 1:250 000 sheet and is correct for 1982. Annual change is 02' easterly.
x F25 Rock chip sample (C.C.E.)
SHEET INDEX
1
2
3
4
0 1 2 3 KM
The Shell Company of Australia Limited
METALS DIVISION
SOUTH AUSTRALIA
FINNISS SPRINGS
Regional Geology
(Sheet 4)
Scale 1 : 50000
REVISED:
REPORT No.
FIG. No. 5
DRG. No. A/TD 01/018
DATE AUG 1982
AUTHOR D.P.B.
DRAWN B. OTTE
OFFICE ADELAIDE
3914-6


CAINOZOIC
Largely recent to Teritiary surficial deposits, some overlying Cretaceous sediments.
Jurassic
ALGEBUCKINA SANDSTONE
PROTEROZOIC (Adelaidean)
Sturtian
TAPLEY HILL FORMATION
TILLITE
Torrensian
BURRA GROUP (undiff)
Willouran
Undifferentiated
DIAPIRIC (?) material
CALLANA BEDS
Fault, observed
Fault, interpreted (largely from regional gravity data)
Clare St. Dora copper mine.
Superimposed outline of target gravity anomaly, from Curdimurka 1:250 000 sheet.
Pastoral station with airstrip.
137°30'
29°30'
29°45'
30°
E.L. 1019 (Formerly E.L.634)
Bopeechee
Alberrie Creek
Wangianna
Northwest Fault
FINNISS SPRINGS
TN MN
7°04'
5 0 5 km
MAGNETIC VALUE WAS TAKEN FROM CURDIMURKA 1:250000 SHEET AND IS CORRECT FOR 1982. ANNUAL CHANGE IS 02' EASTERLY.
Geology from SADME, Curdimurka 1:250 000 (Provisional) & Shell mapping & interpretation.
The Shell Company of Australia Limited
METALS DIVISION
SOUTH AUSTRALIA
FINNISS SPRINGS E.L.1019
Regional Geology.
SCALE 1:250 000
DATE August 1982
AUTHOR M.L.H.
DRAWN T.O'C.
OFFICE Adelaide
REP.No.
DRG.No.A/TD01/019
FIG.No. 6


Welcome Ck
HERMIT HILL
Bopeechee
Alberrie Creek
Wangianna
Deep Ck
FINNISS SPRINGS
The Gregory Ck
29° 30'
29° 45
30°00'
137°30'
The Shell Company of Australia Limited
METALS DIVISION
SOUTH AUSTRALIA
FINNISS SPRINGS
Bouguer Anomaly Map
SCALE 1:250 000
DATE AUG. 1982
AUTHOR
DRAWN
OFFICE ADELAIDE
REP. No.
DRG. No. A/TD01/20
FIG. No. 7



29° 45'

137° 30'

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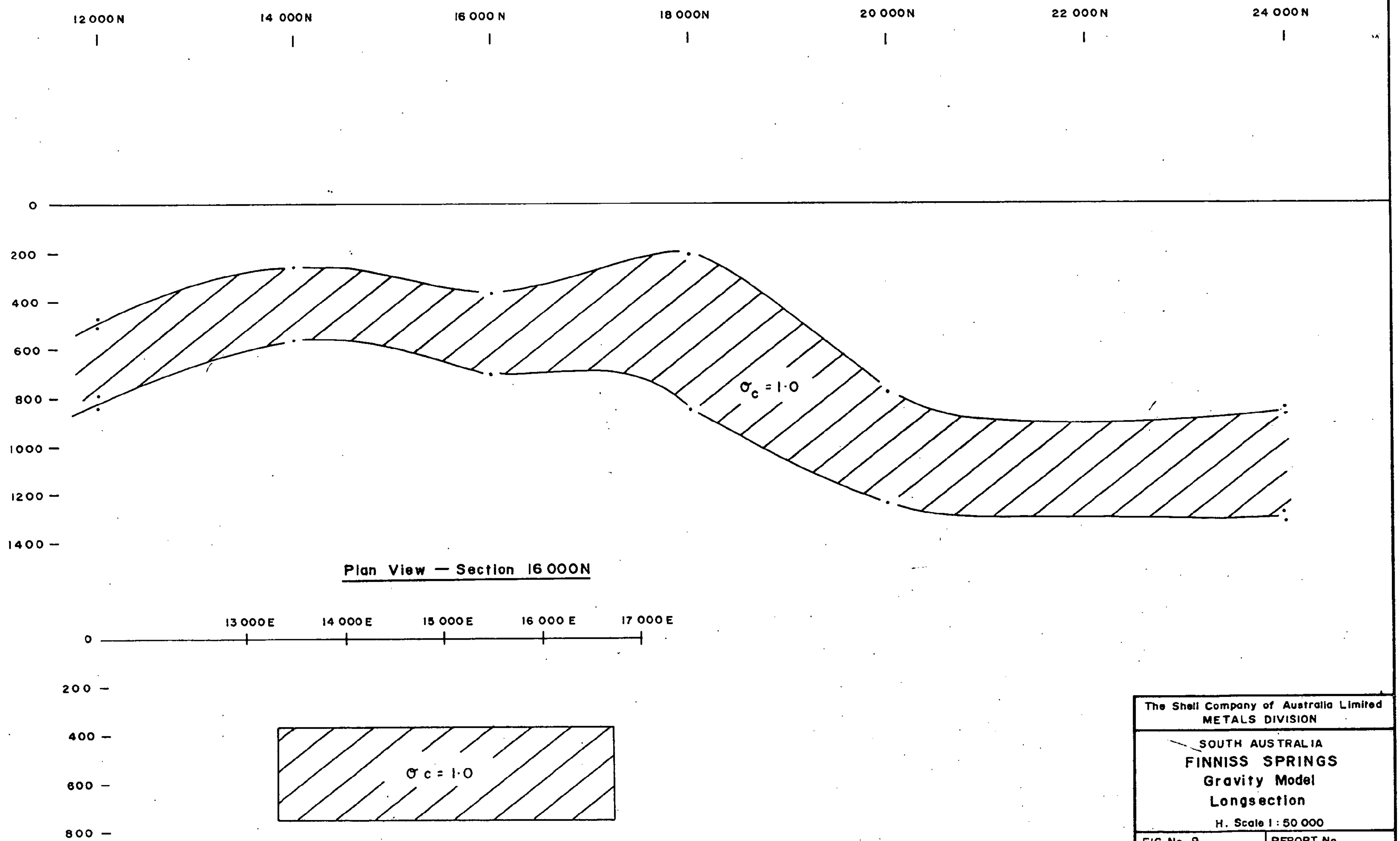
METALS DIVISION	
E.L. 634	
FINNISS SPRINGS	
AEROMAGNETICS	
Scale 1 250 000	
FIG. No 8	REPORT No.
ENCL. No.	DRG. No. A/TD 01/005
DATE FEB. 1982	AUTHOR SADME
DRAWN SADME	OFFICE ADELAIDE



The Shell Company of Australia Limited METALS DIVISION	
SOUTH AUSTRALIA FINNISS SPRINGS Gravity Model Longsection H. Scale 1 : 50 000	
FIG. No. 9	REPORT No.
ENCL. No.	DRG. No A/TD 01/013
DATE JULY 1982	AUTHOR A.H.B.
DRAWN B.J.O.	OFFICE ADELAIDE

APPENDIX I

INFO	ACT
MLH	NUD
AAB	✓
RECD	26/7/82
FILE	

Central Mineralogical Services

CMS
39 Beulah Road
Norwood, S.A. 5067
Telephone 42 5659

FILE		
RECD		
INFO	ACT	

Mr. D. Bailey
Geologist
The Shell Co. of Aust. Ltd.
Metals Division
P.O. Box 1319
ADELAIDE / S.A. 5001

23rd July, 1982

REPORT CMS 82/6/17

YOUR REFERENCE: Sample Despatch No. 3963/TD01/DPB/PET-1

DATE RECEIVED: 18th June, 1982

SAMPLE NOS.: 6620 - 6632

SUBMITTED BY: D. Bailey

WORK REQUESTED: Petrology

H.W. Fander, M. Sc.

REPORT CMS 82/6/17

Fifteen rock samples were received for petrological examination and were accompanied by notes outlining geological relationships and specific queries. Representative thin-sections were prepared and examined together with the hand specimens and offcuts under stereobinocular and petrological microscopes. STain-tests for K-feldspar and carbonate were carried out as warranted. Generally, semi-detailed descriptions were prepared, with some of the specimens described partly by analogy. Descriptions include comments on specific queries relating to individual samples or sample groups.

Summary

The bulk of this suite consists of dolomites and comments will be restricted to this group since the subordinate lithologies require no special comment.

The dolomites are massive to laminated, with minor intercalated quartzose psammopelites. The majority are reasonably correlated with the Willouran (Callana Beds) dolomites, specifically as recently described by Rowlands et. al. (1980). Several of these rocks exhibit evaporitic features, particularly pseudomorphed "mud crystals", some of which are essentially identical to those described by Rowlands et. al. Whilst specific identification of the pseudomorphed phases is tenuous and open to question, the major conclusion relating to saline depositional environments is confirmed.

The dolomites, in general, exhibit low-grade metamorphic features consistent with deep burial-induced recrystallization and "grading" into sub- to low-greenschist facies regional effects. There is a possible complication in interpretation of evaporite casts in such sediments, particularly relatively pelitic types, by confusion with metamorphic blasts, for example magnetite or pyrite. Instances of misinterpretation of oxidised pyrite as representing halite casts are common. Similarly, the writer is aware of areas of interpreted "evaporitic spotting" related to weathered cordierite porphyroblasts.

A further interpretation of sedimentary environments will be dependant on appraisal of meso- to macroscale structures and relationships, along the lines of the Rowlands et. al. interpretation.

D. Cowan, B.Sc.

Petrological Descriptions

6620 (T.S. 42519)
This sandstone can be classified as a weakly gypseous subarkose. Texturally, it comprises a weakly fine sand-parted, moderately sorted, fine to medium sandstone. The framework (70-75 %) consists of subangular to rounded quartz with subordinate (10-15 %) alkali feldspar grains (mainly microcline), accessory leucoxenic semi-opaques, lithic clasts (argillaceous arkosic siltstone and shale), and rare detrtial zircon and schorl. The matrix/cement comprises overgrowth and intergranular quartz.

Fine-grained gypsum with subordinate anhydrite and associated traces of ultrafine-grained carbonate are disseminated throughout. The bulk occurs as cavity-fillings and as partial cavity-linings, but these grade into discontinuous films. The cavities represent leached framework particles (i.e. clasts), specifically feldspar grains and pelite fragments. That is, the gypsum-anhydrite assemblage is secondary. The rock, as a whole, lacks primary "evaporitic" characteristics.

6621 A,B,C (T.S. 42507A, B, C)
These three rocks are similar to the extent that individual descriptions are unwarranted. The lithology can be classified as a riebeckite hornfels of low-grade contact-metasedimentary origin. Riebeckite is of contact-metasomatic character.

The rock consists essentially of microcrystalline albite and quartz with ubiquitous, partly degraded (secondary) sideritic carbonate as a replacement of indeterminate micas (phlogopite-biotite). Fine tuft-like clusters of riebeckite are pervasive and decrease in abundance of A, though B to C. Oxidised pyrite cubes (max. 250 μ, typically < 100 μ) are disseminated throughout and are relatively concentrated in C.

Fabrics arehornfelsic. Relict sub- to fine millimetric bedding laminations are pervasive along with vague relict silty clastic features. Recrystallization is slightly more marked in A than in B and particularly C, thus parallelling the proportions of riebeckite.

The assemblage approximates to low albite-epidote hornfels facies. Co-existence of albite and riebeckite implies a relatively sodic composition, unusual for Tapley Hill Formation sediments, and thus tends to confirm Na-metasomatism.

6622 (T.S. 42508)
This is a well-lithified, but unmetamorphosed slightly fine sandy siltstone, verging on a silty shale. The rock is faintly bedded, with lenticular, relatively silty, or locally fine sandy, partings. Main constituents are silt-sized detrital white mica flakes (illite, degraded muscovite) relatively minor detrital quartz, accessory

detrital alkali feldspar (orthoclase, albite), leucoxenic semi-opaques, rare authigenic schorl, and the shaly fraction of optically ill-defined kaolin-illite. Incipient Fe-staining in part reflects oxidation of ultrafine Fe-carbonate stainings, and there are extremely rare oxidised pyrite cubes (< 50 μ).

This sediment is of simple composition and, in common with the bulk of pelitic sediments, is poorly diagnostic in terms of stratigraphic correlation.

6623 (T.S. 42509)
This rock is best termed a silicified breccia and consists essentially of randomly sized (250 μ - 2 cm+), angular to rounded clasts of fine-grained dolomite, variably silicified and cemented by fine-grained quartz. The clast "framework" is weakly banded, with a faint dimensional preferred orientation. Silicified fragments of pelitic sediment represent an accessory clast component, but are ill-defined optically. A few clasts include sparse oxidised, fine-grained pyrite disseminations of relict "syngenetic" character.

The replacive quartz is cherty microcrystalline to fine-grained (subhedral, more typically granular) and is variably stained with corroded inclusions of dolomite. Matrix quartz is relatively optically clear, but similarly-textured and tends to be optically continuous with replacive quartz, such that the margins of the more thoroughly silicified clasts may be defined only by the distribution of inclusions. Late veinlets and small vugs of quartz and subordinate semi-lustre-mottled dolomitic carbonate occur sporadically. There is no detectable Cu-mineralisation.

6624 (T.S. 42510)
An impure dolomite with secondary Cu-mineralisation, fracture-controlled with malachite and Cu-stained clays developing partly as open space fillings, and elsewhere by impregnation and replacement of granulated, fracture-bounded dolomite aggregates. Malachite is locally microcrystalline and pseudomorphs a vaguely tabular phase, conceivably atacamite, although this is rather speculative in the absence of relics.

The host rock is a massive to banded, granular to sparry dolomite, fine- to medium-grained, with thinly disseminated talc and chlorite flakes reflecting incipient metamorphism. Sparse, semi-regular bands and minor irregular zones of quartz with subordinate sparry dolomite are interpreted as "diagenetic" replacements and cavity-fillings and have been recrystallized along with the host rock. Relatively massive dolomite aggregates include thinly disseminated sub- to euhedral quartz grains of authigenic character. There are no evaporitic casts in the area sectioned. Isolated oxidised pyrite euhedra (to 400 μ, cubo-pyritohedral) are variously pseudomorphed by limonite, secondary calcite, or locally malachite.

6625 (T.S. 42511)
This is a quartz-carbonate-chlorite rock, interpreted as a "silicified dolomite" (or, more strictly, a magnesite).

The rock consists largely of fine granular/weakly interlocking to distinctly carbonate rhomb-pseudomorphous quartz (mean 50 μ) with subordinate intergrown, optically complex chlorite (colour-zoned/variable, green to colourless with interleaved ?talc). Cloudy micro-crystalline dolomite-ankerite is pervasive and is concentrated marginal to sporadic veinlets of quartz and dolomite. Ovoid to lenticular and irregular clots of magnesite are pervasive. These are marginally corroded by the dolomite-ankerite and thus appear to represent relics of the primary carbonate phase.

Accessories include disseminated random, relatively coarse flakes of colourless Mg-chlorite and thinly disseminated apparently authigenic colourless tourmaline crystals distributed throughout the host rock and rarely the quartz-dolomite veins. The host rock, as a whole, is mildly recrystallized and approximates to a fine-grained, highly impure marble.

6626 (T.S. 42512)
This is an impure dolomitic marble with affinities to 6625.

The rock consists largely of granular/weakly interlocking dolomite (mean 100 μ) with a weak dimensional preferred orientation parallelling a sub- to millimetric scale banding. This is defined partly by variations in grainsizing, and enhanced by the distribution of accessory bright green Fe-Mg chlorite, subordinate talc, and disseminated single to clustered, an- to subhedral, weakly poikilitic quartz grains. The micas define crude continuous to lenticular partings and isolated conformable stylolites. Quartz is similarly distributed in crude lenses and is of partly recrystallized/marginally corroded authigenic character. Dolomite appears to represent the primary carbonate, in contrast to 6625, although finer details are obscured by the low-grade metamorphic recrystallization.

6627 (T.S. 42513)
A kaolinitic orthoquartzite, verging on a subarkose. This sandstone is weakly bedded, moderately to well sorted in the medium sand range, and has been mildly stressed. It has a framework of subangular to rounded quartz and minor (5 %) alkali feldspar (partly degraded, indeterminate, but largely poorly twinned albite). The matrix/cement consists of overgrowth and minor intergranular quartzwith disseminated intergranular aggregates of illite.

Illite aggregates also develop by weathering/replacement of clastic feldspar grains. Clay aggregates are partly leached and, in marginal areas (i.e. of the hand specimen), tend to be replaced by kaolin. The kaolin forms ill-defined clots, apparently secondary cavity-fillings in part, with interspersed discontinuous microfilms of a bright green, optically amorphous, indeterminate staining. This is conceivably a Cu-stained clay. Problematically, it is present in such minute traces that identification, even by XRD, would be tenuous.

6628 (T.S.42514)
A slightly impure dolomite or, strictly, a low-grade dolomitic marble, this rock bears some affinities with 6626. It consists essentially of granular to sparry, weakly interlocking dolomite (mean 100 μ), incipiently stained with virtually submicroscopic carbonaceous (?graphite) inclusions. Colourless, single to clustered Mg-chlorite flakes are thinly disseminated throughout and there are minor traces of quartz.

The sectioned area includes the sparry dolomite vein exhibiting a tendency to reticulate and discoidal habit in hand specimen. Thin-section examination confirms the characteristic subradial extinction of growth-deformed carbonate, which defines this a primarily a carbonate vein rather than as dolomitic-pseudomorphous in origin. Partial dissolution/redeposition of dolomite is evident along with the development of secondary colloform Mn-oxide and the traces of malachite.

6629 (T.S. 42515)
This is a relatively metamorphosed impure dolomite, exhibiting a weak but penetrative phyllitic fabric, with the preferred orientation parallelling bedding. The metamorphic assemblage is dolomite-quartz-phlogopite-chlorite approximating to low-greenschist facies, although strictly regional metamorphism is not necessarily inferred. The rock comprises a semi-massive dolomite with sporadic dolomitic shaly and quartzitic interbeds.

The matchstick-like features, conspicuous on some weathered surfaces, consist of thoroughly sericite-stained aggregates of alkali feldspar (albite, K-feldspar) with accessory phlogopite and quartz and minor dolomite stainings. Microtextural features confirm the sericitic pseudomorphism as pretectonic or early syntectonic. These features are essentially square-sectioned prisms, slightly tapered, with simple planar or irregular terminations. The habit is atypical of authigenic feldspars, and thus the extensively sericitised feldspar apparently represents post-depositional, but pre-metamorphic pseudomorphs.

Analogous features have been interpreted as pseudomorphed shortite by Rowlands et. al. (1980), Journ. Geol. Soc. Aust. Vol. 27, No. 1, pp 55-67. The present example confirms this as a possible interpretation. It is pointed out, however, that there are other, equally possible interpretations (e.g. barite, anhydrite), and further that, based on illustrations in the literature, this habit is not particularly common in shortite (specifically in the Green River Formation). The major conclusion that these features are ultimately of evaporitic affinities is the more important.

6630 (T.S. 42516)
This is a highly impure dolomite, grading into a dolomitic quartzite, and largely detrital in origin, although finer details are obscured by recrystallization. Major components are granular to sparry dolomite and granular quartz in variable, but overall near-equant proportions.

Fe-Mg chlorite is a more or less pervasive accessory, along with sporadic muscovite flakes. The rock is medium-grained, with vague but diagnostic relict medium sandy clastic fabrics and a zone of silty to fine sandy, relatively chloritic recrystallized dolomite.

This specimen is devoid of tangible pseudomorphed "evaporitic" features. It is essentially representative of, and closely analogous to, the quartzose sandy interbeds in 6629, but reflects a slightly lower-grade metamorphic assemblage. Patchy, late secondary development of fine to semi-porcellanous calcite ("calcrete") is evident.

6631 (T.S. 42517)
This is a fine- to medium-grained sparry dolomite, relatively banded and relatively pure. The dark grey colouration reflects virtually submicroscopic carbonaceous stainings with a bedded distribution. Thinly disseminated Mg-chlorite flakes are anlogous to those in 6628 and similarly reflect the incipiently metamorphic nature of the rock.

The crudely lenticular to ovoid, fine millimetric-scale pale mottlings are aggregates of quartz with included dolomite and, on the basis of habit, represent recrystallized chalcedonic nodules, or solution vug-fillings. The sectioned area includes sparsely disseminated limonitic clay casts (mean 100 μ) of halite and ?gypsum, rare dolomite-infilled cavities after halite and extremely rare oxidised pyrite subhedra. Late limonitic fractures occur sporadically.

6632 (T.S. 42518)
A relatively fine-grained (mean 50 μ) impure dolomite, this rock is studded throughout with euhedral flakes of colourless Mg-chlorite analogous to those in 6628 and 6631, but relatively coarse, conspicuous and locally exposed on weathered surfaces. Accompanying the chlorite are complex disseminated intergrowths of K-feldspar (adularia), ranging up to 1.5 x 3.5 mm, with featureless to complex "saw-tooth" semi-pseudomorphous shapes suggestive of complexly twinned gypsum crystals.

Dolomite is weakly but pervasively stained with extremely fine hematite inclusions. Irregular zones of mildly recrystallized quartz appear to represent diagenetic cavity-fillings. These include minor traces of apatite, fine-grained to semi-sericitic white mica, and minor traces of hematite. Recrystallization in this rock is partly stress-induced.

D. Cowan, B. Sc.

APPENDIX II

[redacted]TA[redacted] DI[redacted]ON [redacted]A.)

GEOLOGICAL SAMPLE SHEET

255

PROJECT: FINNISS SPRINGS - TD01

SAMPLE TYPE: ROCK CHIP

SAMPLED BY: DPB

HOLE N°: ....

SHEET 1 OF 2

S.D.O. N° DPB/RC/1/3959.

LABORATORY: COMLABS /B20298

SAMPLE N°	INTERVAL/ LOCATION		Cu AAS	Pb XRF	Zn AAS		Ag AAS	Au AAS		Sn XRF	W XRF	Mo XRF	As XRF	U XRF	COMMENTS
6603			4.50%	2	10		5	0.65		<4	<10	10	960	4	Aggregate chip samples
															from Clara St. Dora Mine
															S.D.O. N° 3962/TD01/DPB/RC-2
															COMLABS 821119
6609			46	5	4		<1	<0.05		6	<10	22		<4	500m section of fault
6610			20	2	6		<1	<0.05		4	<10	14		<4	zone in Pbk in southwest
6611			12	3	8		<1	<0.05		<4	<10	24		<4	of Bopeechee Grid
6612			10	2	4		<1	<0.05		<4	<10	2		<4	Quartz ironstone.
6613			10	5	4		<1	<0.05		4	<10	20		<4	
6614			22	9	10		<1	<0.05		4	<10	40		4	Ironstone breccia - Hermit Hill
6615			38	9	6		<1	<0.05		<4	<10	14		<4	Siliceous ironstone - First Hill
6616			46	7	36		<1	<0.05		<4	10	8		<4	Dark ironstone - Hermit Hill
6617			20	5	90		<1	<0.05		4	<10	8		18	Ironstained sediment - Hermit Hill
6618			12	38	110		<1	<0.05		<4	<10	4		4	Heavy, dark ironstone - near 6609-13
6620			4	8	<2		<1	<0.05		4	<10	14		<4	Silicified ironstained siltstone -
															16000N 15100E.

ANALYSES (in ppm unless otherwise stated) AND TECHNIQUES

[redacted]TAL[redacted] DIV[redacted]N [redacted])

GEOLOGICAL SAMPLE SHEET

256

PROJECT: Finniss Springs - TD01

SHEET 2 OF 2

SAMPLE TYPE: Rock Chip

HOLE No.: ....

S.D.O. No. 3962/TD01/DPB/RC-2

SAMPLED BY: DPB

LABORATORY: Comlabs 821119

SAMPLE No.	INTERVAL/ LOCATION		Fe AAS	Mn AAS		Ni AAS		Sb XRF							COMMENTS
6609			0.50%	150		4		<4							
6610			0.60%	230		12		<4							
6611			1.75%	230		<4		<4							
6612			2.70%	290		<4		<4							
6613			2.40%	290		4		4							
6614			16.0%	95		12		<4							
6615			2.2%	100		<4		4							
6616			23.5%	1800		28		<4							
6617			35.0%	3.00%		16		4							
6618			27.0%	6.00%		4		4							
6620			0.80%	115		<4		4							

ANALYSES (in ppm unless otherwise stated) AND TECHNIQUES

[redacted]TA[redacted]DI[redacted]ON[redacted]A.)

GEOLOGICAL SAMPLE SHEET

PROJECT: FINNISS SPRINGS- TDOI

SAMPLE TYPE: ROCK CHIP

SAMPLED BY: C.C.E.

HOLE No: ....

SHEET 1 OF 9 257

S.D.O. No: ....

LABORATORY: AMDEL

SAMPLE No.	INTERVAL/ LOCATION		Cu C1	Pb C1	Zn C1	Ag C2	Mo C2	Au C3/1	U J3/2	COMMENTS
F1			450	30	30	1	1	0.02	5.5	Massive ?gossanous goethite; top part of a shallowly dipping pyrite lens in a ?calcareous sandstone
F2			12	10	4	<1	1	5.5	1.1	Sideritic, brecciated rock with minor quartz.
F3			18	10	44	<1	1	<0.05	7.9	?Gossanous sideritic calc-rock
F4			6	10	10	<1	1	<0.05	0.8	Quartz calcite vein
F5			10	10	8	<1	1	<0.05	1.6	Quartz calcite breccia
F6			22	5	50	<1	<1	<0.05	2.6	Limonitic sediment.
F7			6	5	12	<1	2	0.05	1.5	Quartz calcite rubble
F8			22	5	<2	<1	1	<0.05	0.4	Grey Quartzite (F22M)
F9			8	5	12	<1	1	<0.05	0.3	?Gossanous Quartzite
F10			12	10	240	<1	1	<0.05	1.9	Probably a false gossan derived from the weathering of siderite
F11			16	5	110	<1	1	<005	1.5	?Gossanous ?calcareous rock
F12			230	5	30	<1	11	0.05	3.7	?Gossanous quartz.
F13			6	<5	2	<1	3	<0.05	0.6	Quartzite (F2M) (F3M)
F14			36	15	450	<1	2	<0.05	4.5	Rock chip over 20m of ?gossanous quartz.
F15			12	170	170	<1	1	0.05	5.5	Grab sample in weathered shale
F16			32	30	220	<1	2	<0.05	4.3	same as F14.
F17			32	15	32	<1	2	<0.05	2.4	?Gossanous material
F18			12	15	190	<1	1	<0.05	0.4	?Gossanous material
F19			10	10	60	<1	1	<0.05	1.3	

ANALYSES (in ppm unless otherwise stated) AND TECHNIQUES

[redacted]TA[redacted]DIV[redacted]ON[redacted].)

GEOLOGICAL SAMPLE SHEET

PROJECT: Finniss Springs - TD01

SHEET 2 OF 9 — 258

SAMPLE TYPE: Rock Chip — HOLE No: .... — S.D.O. No: ....

SAMPLED BY: C.C.E. — LABORATORY: ....

SAMPLE No.	INTERVAL/ LOCATION		Cu C1	Pb C1	Zn C1	Ag C2	Mo C2	Au C3/1	U J3/2	Co C1	Ti SCAN	Zr SCAN	As SCAN	Tl SCAN	COMMENTS
F20			4	10	22	<1	1	<0.05	12.0						Limey shale (F20M)
F21															see F23
F22			36	35	75	<1	<1	<0.05	4.7						see F23.
F23			28	35	110	<1	<1	<0.05	4.5						Gossanous, limonitic, kaolinitic shale.
F24			28	<5	65	<1	1	<0.05							see F23
F25			22	5	110	<1	<1	<0.05							Ferruginous ?gossan
F26			16	<5	6	<1	<1	<0.05							Grey kaolinised shale.
F27			6	<5	2	<1	1	<0.05		5					Kaolinised ?rhyolite/tuff (F5M)
F28			<2	<5	4	<1	46	<0.05		5					Jarosite-haematite clay
F29			8	5	<2	<1	4	<0.05		5					Siliceous pyrite rock (F6M-F11M)
F30			2	<5	16	<1	12	0.05		15					(Pyritic) Limonitic Sandstone
F31			<2	5	2	<1	50	<0.05		5					Massive pyrite in sandstone. (F12M)
F32			6	5	<2	<1	32	<0.05		5					Near F31 (FS-1) (FSS-3)
F33			4	5	8	<1	3	<0.05		<5					Iron rubble
F34			2	5	4	<1	5	<0.05		<5					Jarosite stained rubble
F35			2	5	38	<1	1	<0.05		10					Ferruginous rubble (FSS-7)
F36			6	<5	6	<1	<1	0.05		10					Ferruginous Quantzite Sandstone (FSS-8)
F37			6	<5	2	<1	1	0.10		20					Kaolinised shaley sandstone (F13M)
F38			6	5	2	<1	2	0.05		10					Pyritic quartz (F17M)
F39			44	<5	32	<1	11	<0.05		25					Float: Gossanous Quartz.
F40			50	5	6	<1	1	0.05		5					
F29, F31, F32							20				1000	150	600	150	

M samples refer to petrographic samples.

F1–F24: Clara St. Dora Mine
F25–F26: Finniss Springs
F27–37: Hermit Hill
F38–F : Venables Springs

SURFACE ROCK SAMPLING

PROSPECT : Finnis Springs

LOCATION :

MAIN MINERALS OF INTEREST :

LESSER MINERALS OBSERVED :

TYPE OF SAMPLING — CHIP ☑ CHANNEL ☐ (✓ Where applicable)

SAMPLED BY : D.Heath

DATE : April, 1981

ASSAYS BY : AMDEL

SAM. NUMBER	LENGTH SAMPLED	DESCRIPTION	ANALYSES in ppm Cu	Pb	Zn	Ag	Mo		Au.	U		
F41		Near springs (FW 6 & 7) at Hermit Hill. High	4	5	18	<1	4		<0.02	4		
		broadband count of 80 cps. 60 - 75 cps over 200m^2.							<			
		Limonitic development on quartzite with slightly										
		decomposed pyrite as vein fillings (false gossan).										
		Limonite developed after pyrite.										
F 42		Same location 40m to N.E. Limonitic coated concretion	4	10	8	<1	1		<0.02	<4		
		in quartzite containing abundant pyrite. Broadband										
		count 82 cps.										
F 43		Outcrop over 30m^2, disseminated pyrite but abundant	8	10	14	<1	9		<0.02	<4		
		in metasomatised quartzite. Partly altered to										
		jarosite. No high background.										
F44		False gossan, very iron rich siliceous capping	70	30	20	<1	1		<0.02	12		
		developed on quartzite/sandstone sequence.										
		Unusually ferruginous (purple black). Background										
		count 20cps. Maybe weak gossan, though no sulphide										
		remmants.										

SURFACE ROCK SAMPLING

PROSPECT : Finnis Springs

LOCATION : South Australia.

MAIN MINERALS OF INTEREST :

LESSER MINERALS OBSERVED :

TYPE OF SAMPLING CHIP ☑ CHANNEL ☐ (✓ Where applicable)

SAMPLED BY : D.Heath

DATE : April, 1981

ASSAYS BY : AMDEL

SAMPLE NUMBER	LENGTH SAMPLED	DESCRIPTION	ANALYSES in ppm Cu	Pb	Zn	Ag	Mo		Au	U
F45		Across strike of outcrop of breccia. Sideritic	6	5	8	<1	1		<0.02	6
F46		consisting mainly of quartzite (hard) and sandstone	8	5	12	<1	1		<0.02	4
F47		pieces in quartzose (partly ?chloritic) matrix.	6	5	6	<1	1		<0.02	6
		Matrix is minor - 20%. Body still retains most of								
		strike of original metasediments.								
F48		Ferruginous (sideritic) breccia. 50 has larger	4	5	8	<1	2		<0.02	8
F49		amounts of quartzite enclosed in it. Generally, as	4	5	8	<1	1		<0.02	6
F50		for 45 - 47, no minerals evident apart from Fe	6	5	8	<1	<1		<0.02	<4
		metasomatism.								
F51		Breccia from hill over shallow gully to south.	4	5	8	<1	<1		<0.02	<4
		Sample over approx. 2m width. Sideritic with probable								
		sericitic alteration in areas. Breccia mainly in sandstone/quartzite. Bedding destroyed.								

SURFACE ROCK SAMPLING

PROSPECT : Finnis Springs
LOCATION: South Australia.

MAIN MINERALS OF INTEREST:
LESSER MINERALS OBSERVED:
TYPE OF SAMPLING CHIP ☑ CHANNEL ☐ (✓ Where applicable)

SAMPLED BY: D.Heath
DATE: April, 1981
ASSAYS BY: AMDEL

SAM NUMBER	LENGTH SAMPLED	DESCRIPTION	Cu	Pb	Zn	Ag	Mo		Au.	U		
			ANALYSES in ppm									
F52		Sideritic breccia - developed in predominantly sandstone. Little sericitization and sample over 1.5m along strike.	6	5	8	<1	1		<0.02	<4		
F53		Ferruginous brecciated sandstone, minor sericitization Alteration of quartz grains over approx. 3m width. (Min sample)	4	5	4	<1	<1		<0.02	<4		
F 54		Ferruginous breccia predominantly quartzite/ sandstone. Sample over 4.5m. (Min Sample)	8	10	12	<1	1		<0.02	<4		
F55		Ferruginous breccia. Minor sericitisaion with a few small carbonate vughs. Sample over 3.5m across altered strike. (Min Spec.)	6	10	12	<1	<1		<0.02	<4		
F56		Quartzite partially brecciated with some resolution of quartz. Minor alteration. Sample across altered strike over 4m. (Min Spec.)	26	20	10	<1	1		<0.02	<4		

SURFACE ROCK SAMPLING

PROSPECT: Finnis Springs.

LOCATION: South Australia.

MAIN MINERALS OF INTEREST:

LESSER MINERALS OBSERVED:

TYPE OF SAMPLING: CHIP [✓] CHANNEL [ ] (✓ Where applicable)

SAMPLED BY: D.Heath

DATE: April, 1981

ASSAYS BY: AMDEL

SAMPLE NUMBER	LENGTH SAMPLED	DESCRIPTION	ANALYSES in ppm Cu	Pb	Zn	Ag	Mo		Au	U		
F57		PORTER HILL. Hard, very siliceous sandstone and conglomerate. Slightly ferruginous. Has undergone remobilisation to form hardcap.	6	5	6	<1	1		<0.02	4		
F58 - F60.		1500m north of Porter Hill, area of purple white and red kaolinised clay with thinly bedded altered shales with beautifully irridescent limonite films. (Widespread common opal)										
F58		Selected sample of black-purple shales with irridescent limonite. (Broadband count 60 - 80cps)	22	55	26	<1	34		<0.02	36		
F59		Random grab sample across strike over 5m of shale. (Blue, black, red and cream)	24	40	26	<1	34		<0.02	30		
F60		Sample of shales showing irridescent limonitic and red and purple ochrous altered claystones. (Broadband 90cps)	24	85	24	<1	37		0.02	32		
F61		Sample of ferruginous sandstone (minor alteration) with faint gossan. Sample across strike of thin outcrop over approx. 3m.	4	20	14	<1	2		0.06	<4		

SURFACE ROCK SAMPLING

PROSPECT: Finnis Springs.
LOCATION: South Australia.

MAIN MINERALS OF INTEREST:
LESSER MINERALS OBSERVED:
TYPE OF SAMPLING: CHIP ☑ CHANNEL ☐ (✓ Where applicable)

SAMPLED BY D.Heath
DATE April, 1981
ASSAYS BY: AMDEL

SAMPLE NUMBER	LENGTH SAMPLED	DESCRIPTION	ANALYSES in ppm Cu	Pb	Zn	Ag	Mo		Au.	U		
F62		Selected sample altered ?quartzite adjacent sample F61. (Min Spec)	4	5	10	<1	1		0·05	<4		
F63		Very ferruginous sandstones with haematite traces. Sintered appearance. "False gassan". Grab sample on valley floor.	4	5	12	<1	2		0·04	<4		
F64		Partially brecciated sideritic quartzite occurring in a contorted folded sequence at small valley walls. Hard minor incipient sericitisation of more argillaceous beds. Contorted bedding. Sample over 7m across strike.	6	10	10	<1	1		0·03	<4		
F65		Chloritic partially silicified ?tuff with minor ferruginisation in veins and joint surfaces. Selected sample from floaters adjacent to large quantity of milky quartz floaters.	90	5	14	<1	<1		0·03	4		

SURFACE ROCK SAMPLING

PROSPECT : Finnis Springs

LOCATION : South Australia.

MAIN MINERALS OF INTEREST :

LESSER MINERALS OBSERVED :

TYPE OF SAMPLING: CHIP ☑ CHANNEL ☐ (✓ Where applicable)

SAMPLED BY D.Heath

DATE : April, 1981

ASSAYS BY : AMDEL

SAMPLE NUMBER	LENGTH SAMPLED	DESCRIPTION	ANALYSES in ppm Cu	Pb	Zn	Ag	Mo		Au	U		
F66		Channel outcrop sample of several rock types across strike of 8m. Mostly altered quartzite	12	15	16	<1	1		0.03	4		
F67		Very ferruginous sandstone partially gossanous. Selected sample over approx. 4m across strike.	8	10	190	<1	2		<0.02	<4		
F68		Selected grab sample of quartz mainly white but slightly ferruginous and containing minor pyrite.	4	5	22	<1	1		0.02	<4		
HERMIT HILL AREA.												
F69		Very ferruginous poorly sorted sandstone partly gossanous. Selected sample from small outcrop on hill slope. Occurrence mainly in predominantly quartzite sequence.	12	5	12	<1	9		0.02	<4		
F70		Ferruginous "breccia" probably recemented hardcap (quartzite). Trace of pyrite.	4	5	10	<1	1		0.02	<4		
F71		Weakly ?gossanous sandstone/quartzite sequence. Broadband count 40cps.	6	5	20	<1	5		0.02	6		

SURFACE ROCK SAMPLING

PROSPECT: Finnis Springs
LOCATION: South Australia

MAIN MINERALS OF INTEREST:
LESSER MINERALS OBSERVED:
TYPE OF SAMPLING: CHIP ☑ CHANNEL ☐ (✓ Where applicable)

SAMPLED BY: D.Heath
DATE: April, 1981
ASSAYS BY: AMDE:

SAMPLE NUMBER	LENGTH SAMPLED	DESCRIPTION	Cu	Pb	Zn	Ag	Mo		Au	U	
			ANALYSES in ppm								
AREA OF F2											
F72		Sandstone with partially brecciated areas, some quartz veining. No mineralisation except siderite limonite. Some quartz - soft, crumbling. From outcrop in creek to NNW of main (F46) breccia zone.	30	5	10	<1	1		<0.02	<4	
F73		Close to breccia zone along creek. Quartz vein in sandstone and quartzite. Approx. 1.5m x 0.2m Ferruginous some recementation. Trace of pyrite.	6	<5	6	<1	1		0.04	6	
F74		Sample of partially brecciated sandstone showing moderate amount of sericitisation. Some calcite veining, moderately ferruginous (?Siderite). Sample across strike over 2m. From small area at least 150m and separate from the main breccia zone (F46)	4	5	6	<1	1		0.03	4	

SURFACE ROCK SAMPLING

PROSPECT: EL 634

LOCATION: "Finniss Springs"

MAIN MINERALS OF INTEREST:

LESSER MINERALS OBSERVED:

TYPE OF SAMPLING: CHIP ☐ CHANNEL ☐ (✓ Where applicable)

Reconnaissance Water Sampling.

SAMPLED BY: S. Shelton, D. Heath.

DATE: 25th-28th March 1981

ASSAYS BY: Amdel.

SAMPLE NUMBER	LENGTH SAMPLED	DESCRIPTION	ANALYSES									
			PH.		PPB U		PPB Cu		PPB Zn		PPB. Mo	
FW 1			8·5		0·4		20		16		2	
2			7·5		1·5		6		6		2	
3			7·5		0·4		6		5		2	
4			7·5		0·4		3		4		2	
5			9		15		4		2		45	
6			9 +?		1·3		2		3		1	
7			7·5-8		0·2		6		11		1	
8			7·5		0·2		7		7		1	
9			7·5		0·2		2		2		1	
10			9+		0·8		22		3		1	
11			8		0·9		2		<2		5	
12			9		1·7		<2		<2		2	
13			7·5		11		3		<2		45	
14			9 +		1·0		14		7		3	
15			7·5		0·3		3		2		1	
16			8 +		0·1		7		8		2	
17			8·5		0·4		<2		2		2	

SURFACE ROCK SAMPLING

PROSPECT : EL 634
LOCATION :

MAIN MINERALS OF INTEREST :
LESSER MINERALS OBSERVED :
TYPE OF SAMPLING CHIP [ ] CHANNEL [ ] (✓ Where applicable)

SAMPLED BY :
DATE :
ASSAYS BY :

SAMPLE NUMBER	LENGTH SAMPLED	DESCRIPTION	ANALYSES PH		PPB U		PPB Cu		PPB Zn		PPB Mo	
FW 18			8		0·2		6		15		1	
19			9+		1·7		<2		<2		1	
20			5·5		1·2		110		20		10	
21			7		<0·1		8		13		2	
22			7-7·5		0·1		7		5		2	
23			7·5		0·2		5		5		2	
24			7		0·2		4		5		2	
25			7		0·2		<2		<2		<1	
26			6·8		0·1		2		3		1	
27			7-7·5		0·4		<2		2		<1	
28			6		1·6		4		2		3	
29			7		3·3		<2		<2		2	
30			7·5		0·1		<2		2		<1	
31			7·5		0·2		2		2		<1	
32			7·5		0·1		2		4		<1	
33			7·8		0·4		<2		2		<1	
34			7·5		0·2		2		4		1	

SURFACE ROCK SAMPLING

PROSPECT : EL 634
LOCATION :

MAIN MINERALS OF INTEREST :
LESSER MINERALS OBSERVED :
TYPE OF SAMPLING CHIP ☐ CHANNEL ☐ (✓ Where applicable)

SAMPLED BY :
DATE :
ASSAYS BY :

SAMPLE NUMBER	LENGTH SAMPLED	DESCRIPTION	ANALYSES PH		PPB U		PPB Cu		PPB Zn		PPB Mo	
FW 35			7.5		0.2		<2		5		<1	
36		Note: High salt concentration.	9+		70		<10		<10		80	
37			Not Recorded		0.1		<2		5		1	
38			7.5		0.3		<2		2		<1	
39			5.5		1.1		<2		4		<1	
40			6.5		1.1		13		8		2	
41			7.2		0.4		6		13		<1	
42			7.0		0.7		<2		4		<1	
43			9+		0.6		<2		<2		<1	
44			7.5		0.2		20		17		<1	
45			7.2		0.1		7		9		<1	
46			7.5		1.0		5		10		2	
47			7.5		<0.1		<2		3		<1	
48			9		1.0		<2		2		1	
49			8.5		0.6		<2		5		<1	
50			7.2		<0.1		<2		5		<1	
51			7.2		0.6		3		25		1	

SURFACE ROCK SAMPLING

PROSPECT :
LOCATION :

MAIN MINERALS OF INTEREST :
LESSER MINERALS OBSERVED :
TYPE OF SAMPLING CHIP ☐ CHANNEL ☐ (√ Where applicable)

SAMPLED BY :
DATE :
ASSAYS BY :

SAMPLE NUMBER	LENGTH SAMPLED	DESCRIPTION	ANALYSES PH		PPB U		PPB Cu		PPB Zn		PPB Mo	
FW 52			7.3		<0.1		<2		4		<1	
53			7		<0.1		5		3		<1	
54			7.5		2.3		8		<2		8	
55			7.5		<0.1		2		3		1	
56			7.5		0.3		14		9		2	
57			8		0.4		30		25		2	
58			7.5		0.5		<2		4		1	
59			7.5		0.7		7		5		2	
60			7.5		0.1		4		6		1	
61			5.5		1.3		<2		13		1	
62			6		1.4		12		13		2	
63			5.5-6		0.1		2		9		<1	
64			5.5-6		0.3		12		12		1	
65			5-5.5		1.4		<2		40		1	
66			8		2.6		2		2		20	
67		Note: High Salt Concentration.	5.5		11		<10		<10		15	
68		Note: High Salt Concentration.	5.5		7.8		<10		<10		15	

SURFACE ROCK SAMPLING

PROSPECT :

LOCATION :

MAIN MINERALS OF INTEREST :

LESSER MINERALS OBSERVED :

TYPE OF SAMPLING CHIP ☐ CHANNEL ☐ (✓ Where applicable)

SAMPLED BY :

DATE :

ASSAYS BY :

SAMPLE NUMBER	LENGTH SAMPLED	DESCRIPTION	PH		PPB U		PPB Cu		PPB Zn		PPB Mo	
FW 69		Note: High Salt Concentration.	6		42		<10		<10		20	
70			7.5		0.7		3		8		1	
71			7.5		0.3		3		9		1	
72			7.8		0.1		4		6		1	
73			9		4.0		3		5		4	
74	No	SAMPLE 74 TAKEN	-		-		-		-		-	
75		Note: High Salt Concentration.	5.5		3.3		<10		<10		15	
76			7.8		1.1		3		3		2	
77			7.5		0.2		5		6		2	
78			8		0.3		9		10		2	

[redacted]TA[redacted]DI[redacted]ON [redacted].)

GEOLOGICAL SAMPLE SHEET

PROJECT: Finniss Springs - TD01.

SAMPLE TYPE: Stream Sediment.

SAMPLED BY: C.C.E.

HOLE No.:

SHEET 1 OF 1

S.D.O. No. 271

LABORATORY:

ANALYSES (in ppm unless otherwise stated) AND TECHNIQUES

SAMPLE No.	INTERVAL/ LOCATION		Cu	Pb	Zn	Mo	U S3/2	COMMENTS
FSS-1			38	10	20	13	1.9	
-2			18	10	24	13	2.5	
-3			14	10	44	6	2.6	
-4			18	15	55	1	1.7	
-5			10	10	40	3	1.6	
-6			10	10	26	9	1.4	
-7			14	10	28	4	2.8	
-8								
-9			20	10	65	6	1.9	
-10			18	10	65	6	1.2	
-11			20	10	80	4	1.8	
-12								
-13								
-14								
-15								
-16								
-17								
-18								
-19								
-20								
-21			44	15	34	3		
-22			30	15	30	2		
-23			20	20	40	2		
-24			14	15	34	2		

APPENDIX III

FINNISS SPRINGS - 3RD QUARTER REPORT

GRAVITY MODELLING

The results of the gravity survey were reported in the 2nd Quarter Report. Subsequent computer modelling has been carried out using an in-house iterative gravity modelling programme, GRAMOD.

The gravity profiles have been modelled individually and in combination assuming a 3-D prismatic source (Figs.I-1 to I-7; Lines 12000, 14000, 16000, 18000, 20000, 24000 and combination) X position and X size refer to prism centre-top and ½ width across strike respectively, and Y position and Y size refers to the same along strike. Depth is depth to prism-top and thickness depth-extent. All units are in kilometres.

A summary of results is shown in Table I-1, indicating that the computer fits are generally good (standard deviation between observed and modelled profiles <0.1). The modelling indicates a source 300-500 metres thick with a density contrast of approximately 1 gm/cc. The top of the source is shallowest (about 300 metres) between 14000 and 18000N but appears to deepen to the north and south (>500 metres). Strike extent is in excess of 12 km and width is about 4 km. However the northeast and southwest extensions of the gravity anomaly have not been defined by the present gravity data.

H.N.F. HUNGERFORD.
Senior Geophysicist.
2nd July, 1982.

TABLE I-1

Summary of Gravity Modelling

FINNISS SPRINGS - GRAMOD

LINE	DEPTH m.	DENSITY g/c.c.	THICKNESS m.	FIT
12 000N	470	0.89	370	0.0535
14 000N	260	0.86	300	0.1034
16 000N	370	0.80	330	0.0733
18 000N	210	1.21	850	0.0371
20 000N	780	0.93	460	0.0131
24 400N	850	1.00	470	0.0321
	880	1.17	400	0.0321
(COMBINED	760	0.80	430	0.2211)

```
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OK, C 3
OK, C FINN.PLT2
OK, DO -TTY T$0000
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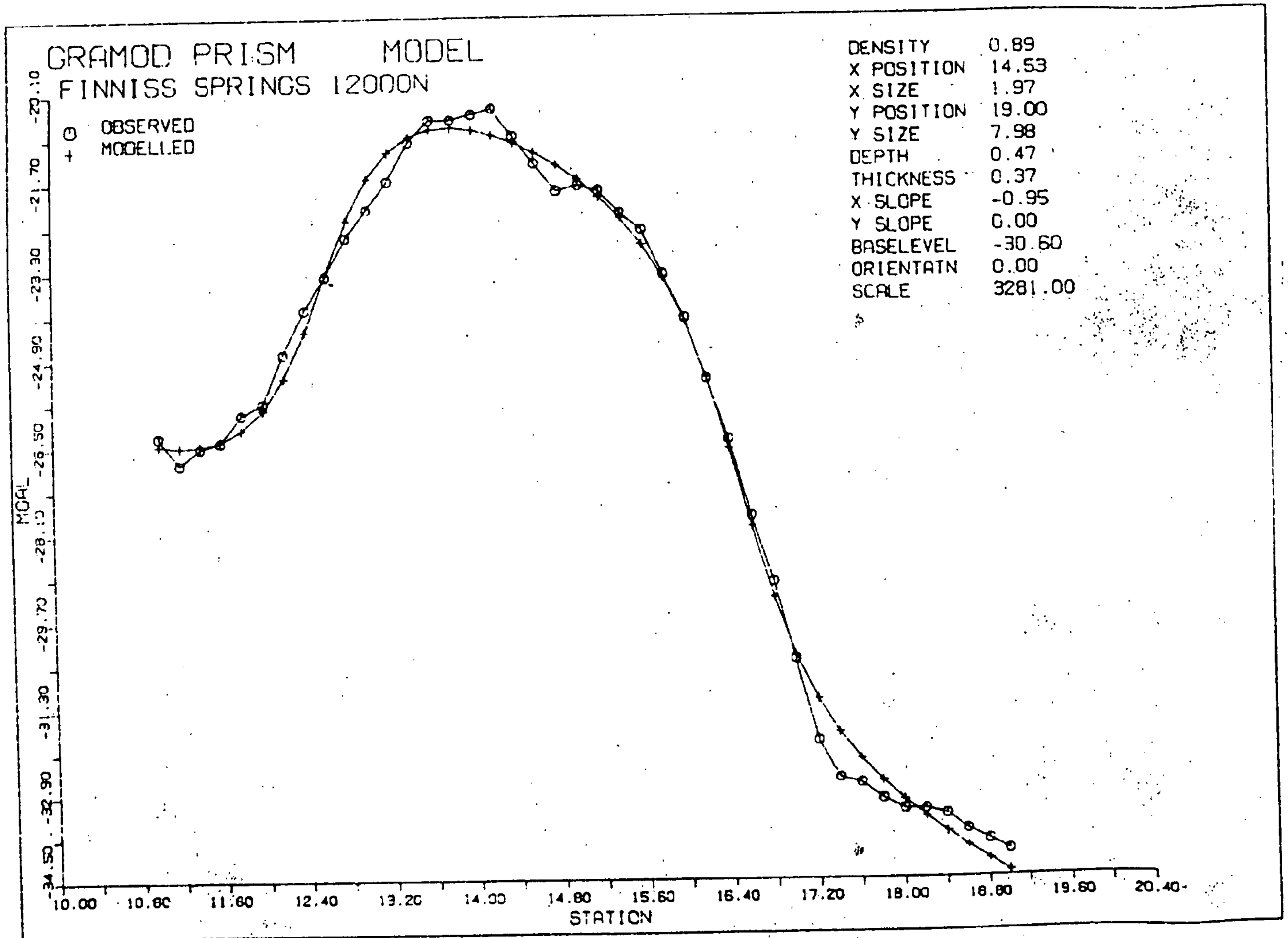
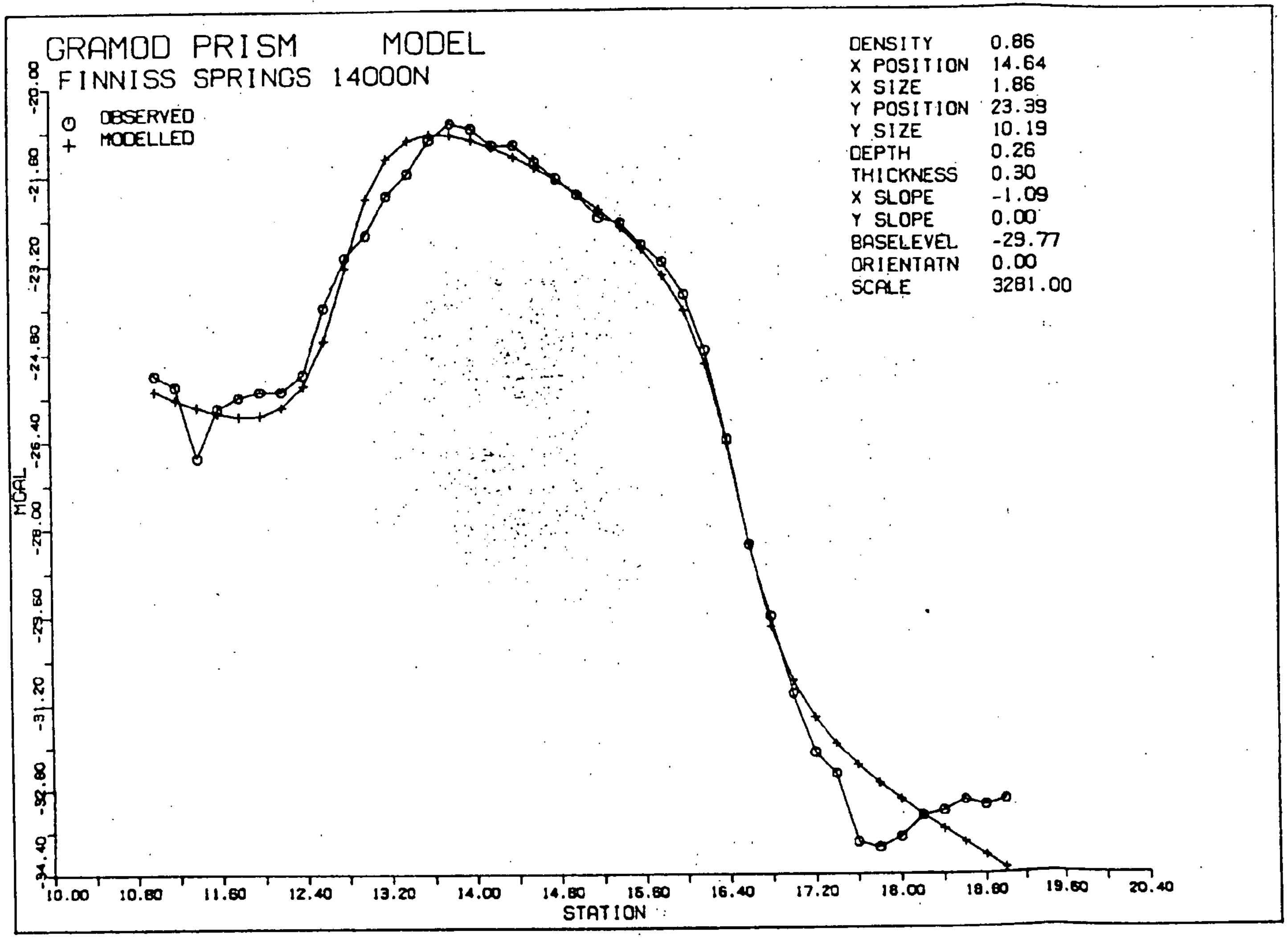


Fig I-1


GRAMOD PRISM MODEL
FINNISS SPRINGS 14000N
OBSERVED
MODELLED
DENSITY 0.86
X POSITION 14.64
X SIZE 1.86
Y POSITION 23.39
Y SIZE 10.19
DEPTH 0.26
THICKNESS 0.30
X SLOPE -1.09
Y SLOPE 0.00
BASELEVEL -29.77
ORIENTATN 0.00
SCALE 3281.00
MGAL
STATION
10.00
10.80
11.60
12.40
13.20
14.00
14.80
15.60
16.40
17.20
18.00
18.80
19.60
20.40
-20.00
-21.60
-23.20
-24.80
-26.40
-28.00
-29.60
-31.20
-32.80
-34.40

FigI-2

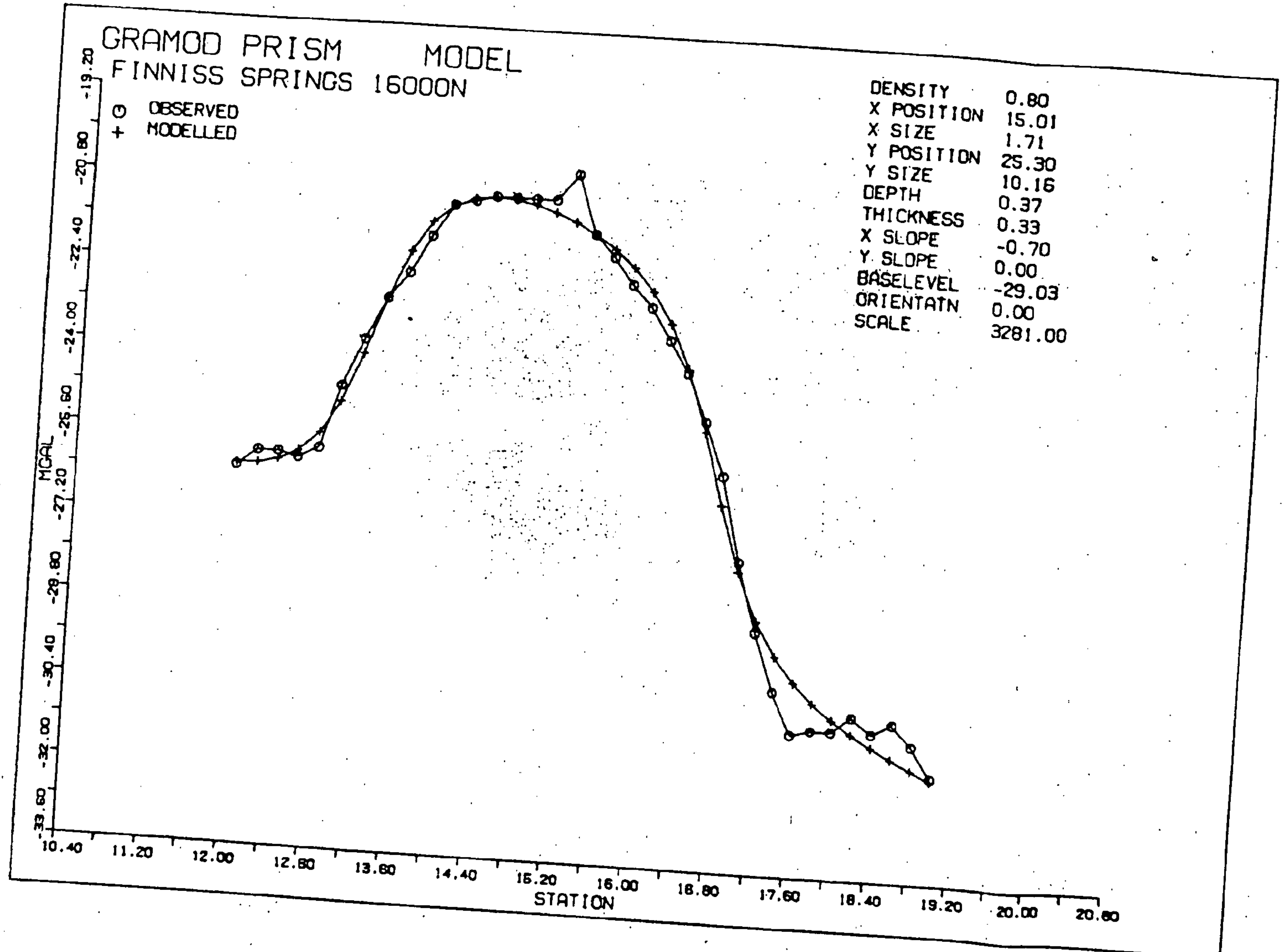

GRAMOD PRISM MODEL
FINNISS SPRINGS 16000N
OBSERVED
MODELLED
DENSITY 0.80
X POSITION 15.01
X SIZE 1.71
Y POSITION 25.30
Y SIZE 10.16
DEPTH 0.37
THICKNESS 0.33
X SLOPE -0.70
Y SLOPE 0.00
BASELEVEL -29.03
ORIENTATN 0.00
SCALE 3281.00
MGAL
-19.20
-20.80
-22.40
-24.00
-25.60
-27.20
-28.80
-30.40
-32.00
-33.60
10.40
11.20
12.00
12.80
13.60
14.40
15.20
16.00
16.80
17.60
18.40
19.20
20.00
20.80
STATION

Fig I-3

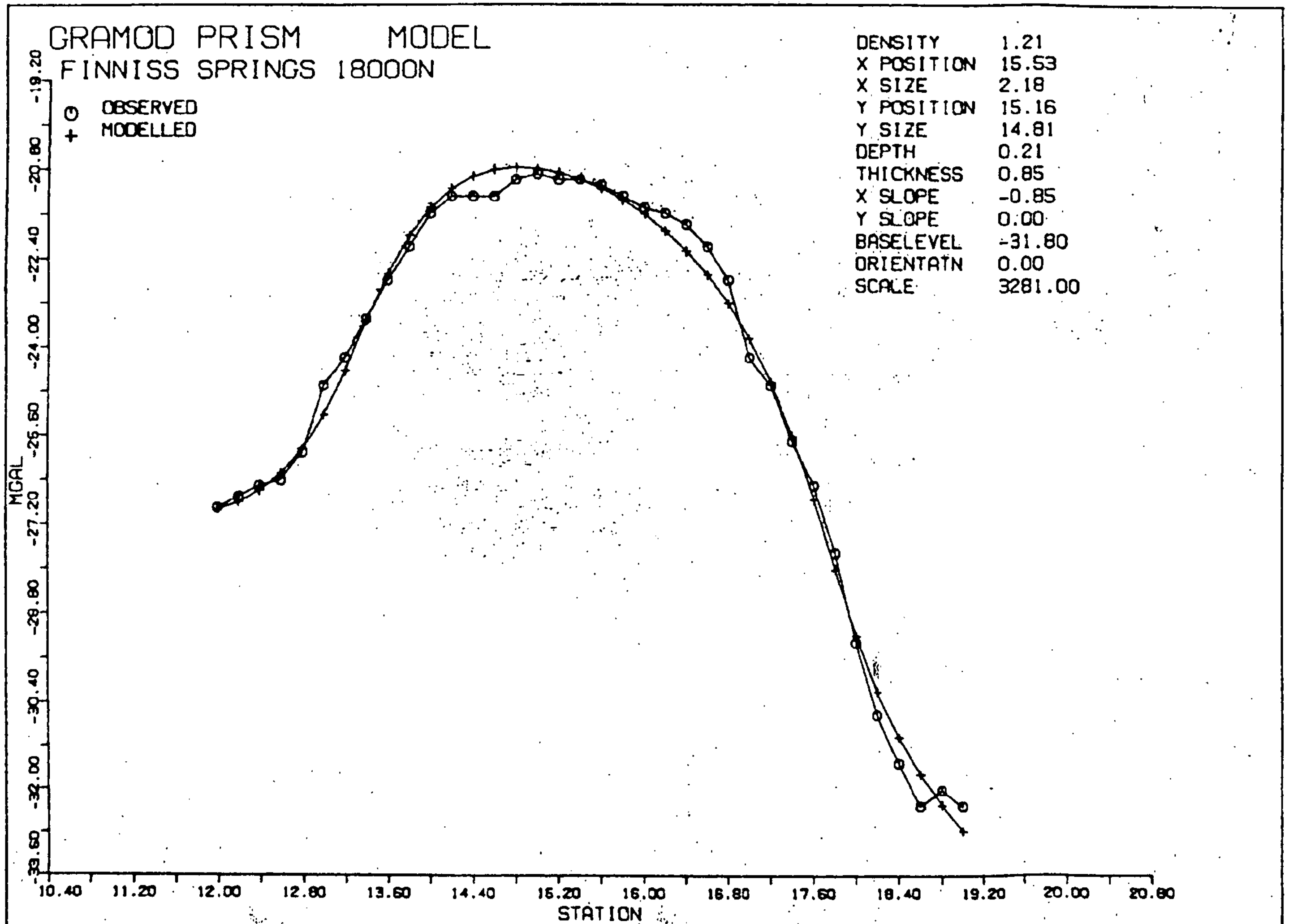

GRAMOD PRISM MODEL
FINNISS SPRINGS 18000N
OBSERVED
MODELLED
DENSITY 1.21
X POSITION 15.53
X SIZE 2.18
Y POSITION 15.16
Y SIZE 14.81
DEPTH 0.21
THICKNESS 0.85
X SLOPE -0.85
Y SLOPE 0.00
BASELEVEL -31.80
ORIENTATN 0.00
SCALE 3281.00
MGAL
-19.20
-20.80
-22.40
-24.00
-25.60
-27.20
-28.80
-30.40
-32.00
-33.60
10.40
11.20
12.00
12.80
13.60
14.40
15.20
16.00
16.80
17.60
18.40
19.20
20.00
20.80
STATION

Fig I-4

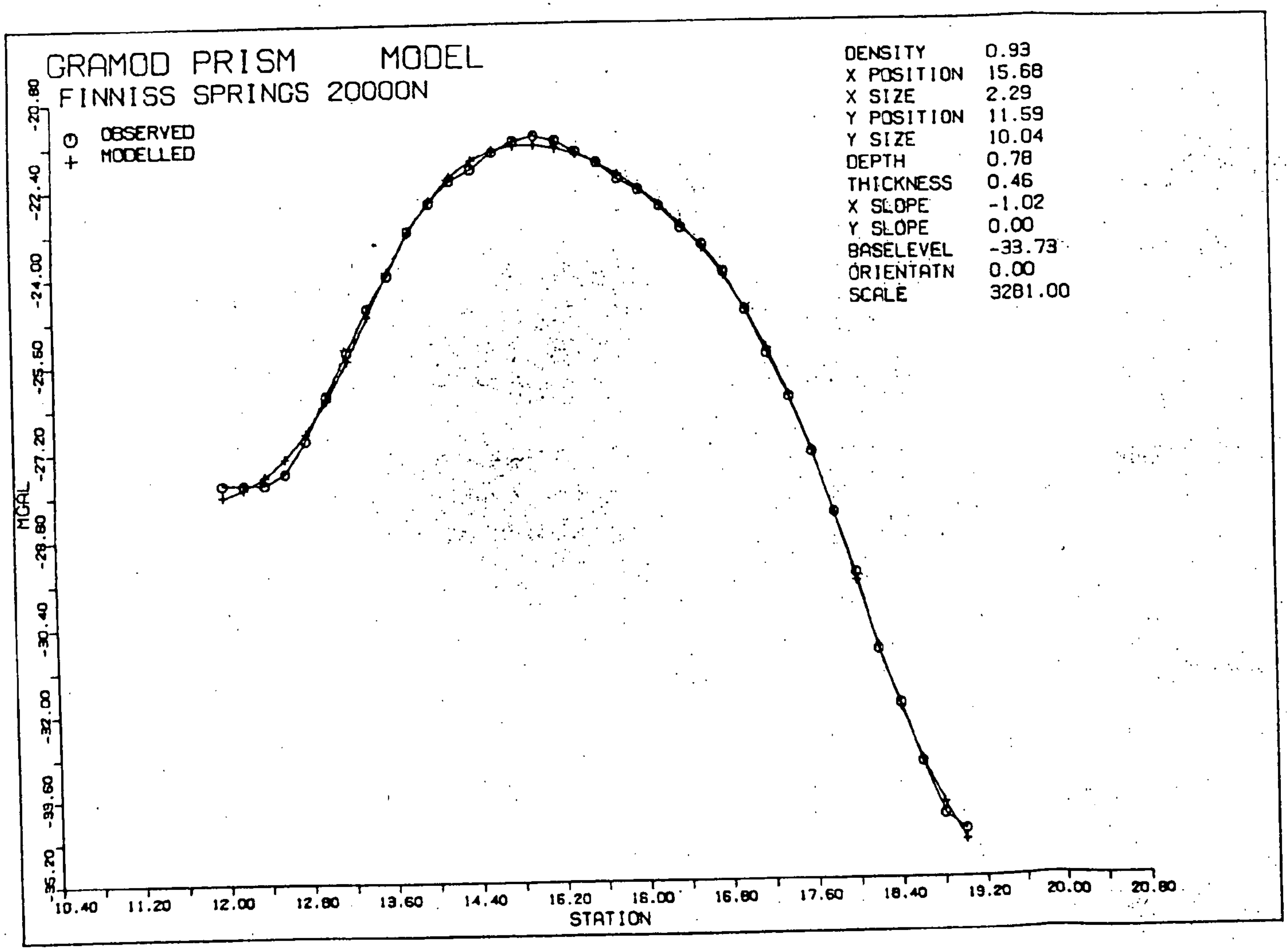

GRAMOD PRISM MODEL
FINNISS SPRINGS 20000N
OBSERVED
MODELLED
DENSITY 0.93
X POSITION 15.68
X SIZE 2.29
Y POSITION 11.59
Y SIZE 10.04
DEPTH 0.78
THICKNESS 0.46
X SLOPE -1.02
Y SLOPE 0.00
BASELEVEL -33.73
ORIENTATN 0.00
SCALE 3281.00
MGAL
-20.80
-22.40
-24.00
-25.60
-27.20
-28.80
-30.40
-32.00
-33.60
-35.20
10.40
11.20
12.00
12.80
13.60
14.40
15.20
16.00
16.80
17.60
18.40
19.20
20.00
20.80
STATION

Fig I-5

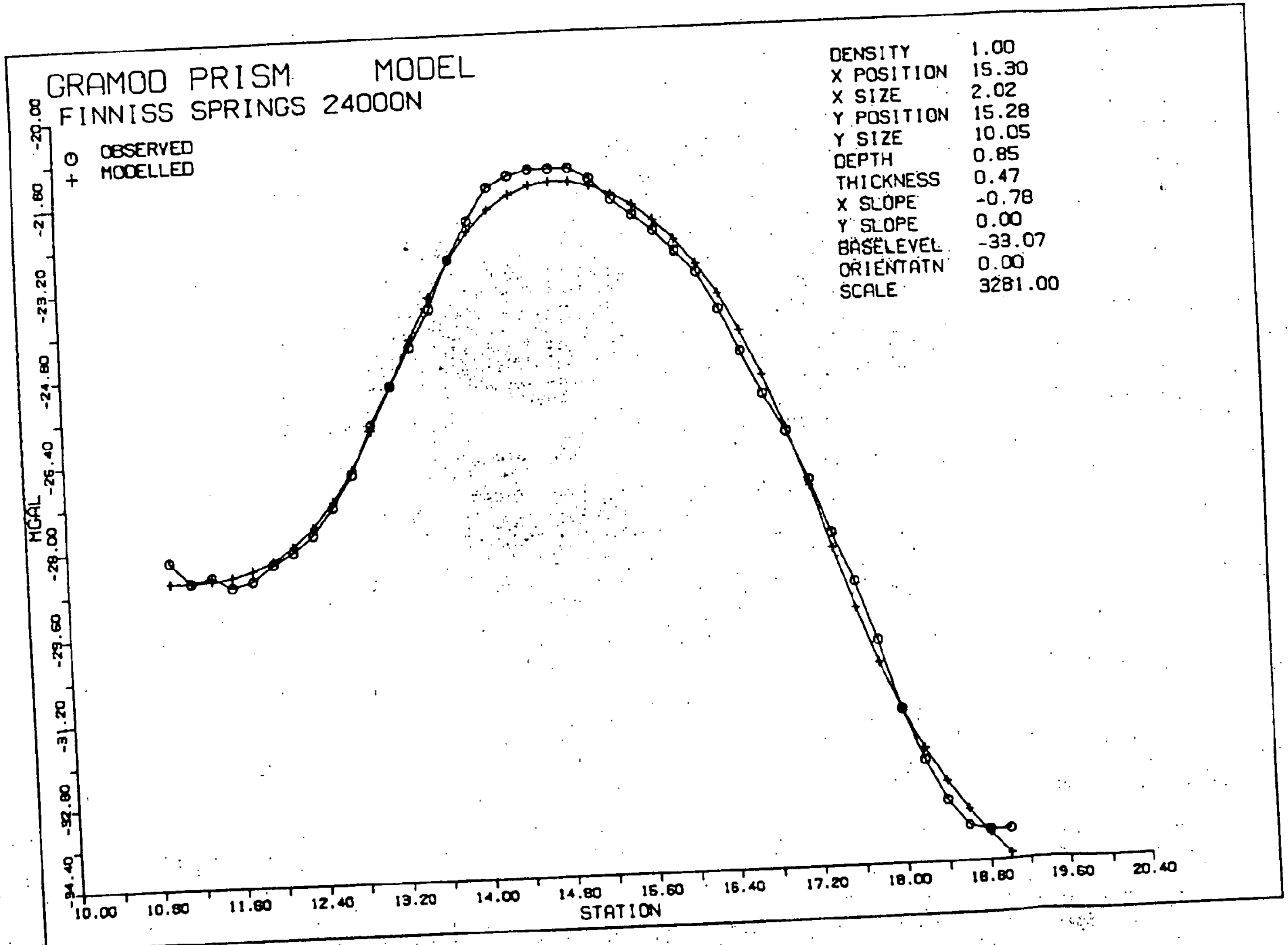

GRAMOD PRISM MODEL
FINNISS SPRINGS 24000N
OBSERVED
MODELLED
DENSITY 1.00
X POSITION 15.30
X SIZE 2.02
Y POSITION 15.28
Y SIZE 10.05
DEPTH 0.85
THICKNESS 0.47
X SLOPE -0.78
Y SLOPE 0.00
BASELEVEL -33.07
ORIENTATN 0.00
SCALE 3281.00
MGAL
-20.00
-21.60
-23.20
-24.80
-26.40
-28.00
-29.60
-31.20
-32.80
-34.40
10.00
10.80
11.60
12.40
13.20
14.00
14.80
15.60
16.40
17.20
18.00
18.80
19.60
20.40
STATION

Fig I-6

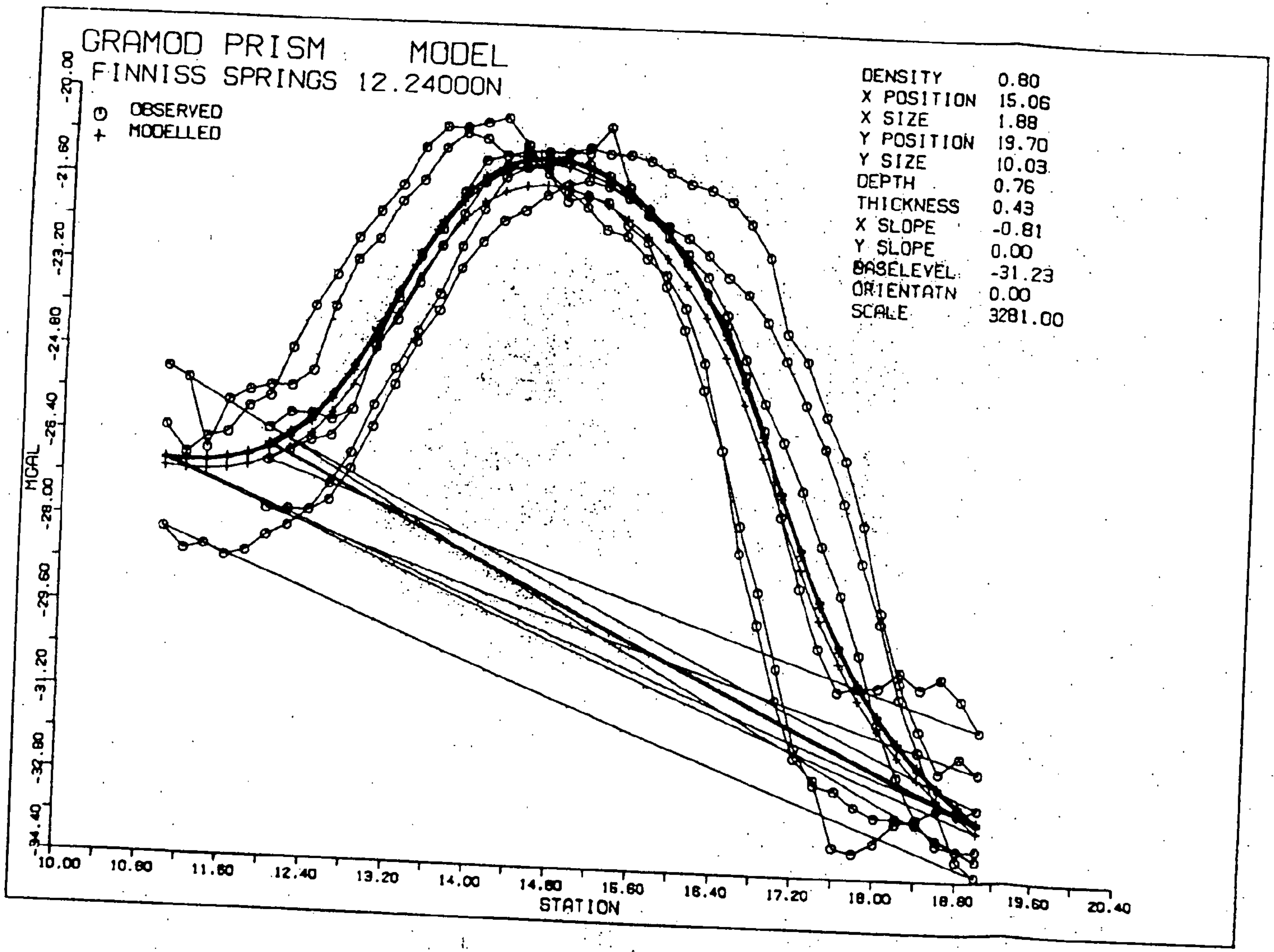
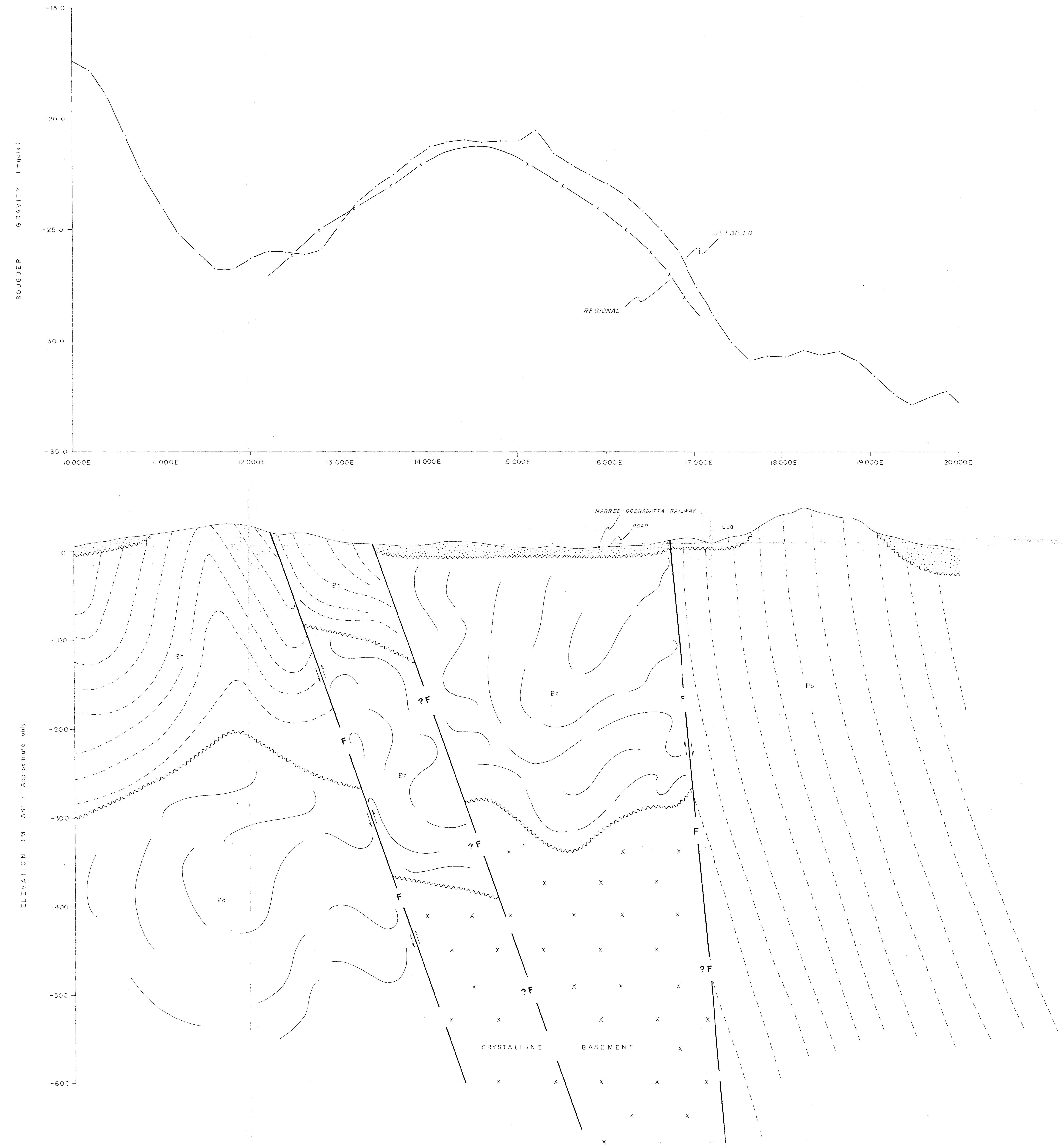

GRAMOD PRISM MODEL
FINNISS SPRINGS 12.24000N
OBSERVED
MODELLED
DENSITY 0.80
X POSITION 15.06
X SIZE 1.88
Y POSITION 19.70
Y SIZE 10.03
DEPTH 0.76
THICKNESS 0.43
X SLOPE -0.81
Y SLOPE 0.00
BASELEVEL -31.23
ORIENTATN 0.00
SCALE 3281.00
MGAL
-20.00
-21.60
-23.20
-24.80
-26.40
-28.00
-29.60
-31.20
-32.80
-34.40
STATION
10.00
10.80
11.60
12.40
13.20
14.00
14.80
15.60
16.40
17.20
18.00
18.80
19.60
20.40

Fig I-7



LEGEND

(stippled)	Cainozoic sediments
Jua	Algebuckina sandstone
Ᵽb	Burra Group
Ᵽc	Callana Group
x x	Crystalline Basement

500m 0 1 KM

The Shell Company of Australia Limited
METALS DIVISION

SOUTH AUSTRALIA

FINNISS SPRINGS

Interpretive
Cross-section on 16 000N

Scale 1 : 25 000

FIG. No. 11	REPORT No.
ENCL. No.	DRG. No. A/TD 01/014
DATE AUG 1982	AUTHOR D P B
DRAWN B J O	OFFICE ADELAIDE

3914-2

CENTRAL COAST EXPLORATION N.L.

PROGRESS REPORT FOR EL 1019

FOR THE QUARTER ENDING 27 JANUARY 1983

CONTENTS

1. SUMMARY

This report details work done and results obtained on exploration on EL 1019 during the period 1 November 1982 to 27 January 1983. Geological re-interpretation of the Bopeechee gravity data was carried out. Cuttings from water bores near the Bopeechee gravity anomaly were examined and the presence of base metal sulphides confirmed. It was decided that subject to availability of a suitable drilling rig, a single drill hole would be drilled to test the gravity anomaly at Bopeechee.

cont'd.../2

2. INTRODUCTION

EL 1019 was granted for a period of one year from 29 July 1982 to Central Coast Exploration N.L. and the Shell Company of Australia Ltd. Shell Company subsequently withdrew from the joint venture. EL 1019 replaces EL 634 which expired on 26 May 1982.

cont'd.../3

3. CONCEPTS

The area is regarded as having potential for strata-bound copper-zinc deposits and also for Olympic Dam type deposits at depth.

cont'd.../4

4. REGIONAL GEOLOGY

Much of the area is covered by sediments of the Adelaide Geosyncline. These sediments accumulated 500 to 1,000 million years ago on the eastern margin of the Gawler Block. The Gawler Block consists of Proterzoic and Archean Metasediments and foliated granitic and mafic igneous rocks.

During sedimentation in the Adelaide Geosyncline there were periodic transgressions onto an unstable basement margin, the Stuart Shelf. This led to an equivalent set of sediments to the Adelaide Geosyncline. The shelf is bounded in the east by the Torrens Hinge Zone, a definable margin of the geosyncline and in the west by the limit of the sedimentary deposition. In the north, the boundary is concealed under more recent sedimentary basins.

cont'd.../5

288A

5. BACKGROUND INFORMATION

The area covered by the licence is centred on Finniss Springs Homestead, located approximately 70 km south west of the town of Marree.

Access through the area is mainly by station tracks. The Port Augusta-Alice Springs railway track passes through the northern section of the area.

cont'd.../6

6. WORK CARRIED OUT TO 27 JANUARY 1983

Subsequent to the decision by Shell to withdraw from the joint venture on EL 1019, Central Coast was faced with the necessity of deciding whether to proceed with further exploration. To assist Central Coast in these deliberations a study was made of the cuttings from water drilling in the Bopeechee area by Australian Groundwater Consultants for Roxby Management Services, who were looking for water supplies for Roxby Downs. These drill holes were drilled about 10 km from Bopeechee to a depth of approximately 100 metres. Cuttings from the holes were examined geologically, and were checked for radiation using a Scintrex GIS3 Spectrometer. Radiation levels were extremely low and not anomalous.

Ultra violet scanning of the cuttings was also carried out to check for traces of fluorescent oxidised uranium minerals. It was hoped that if significant uranium mineralisation occurs at depth in this area that some leakage of uranium mineralisation might occur along fractures into the oxidised zone and that this could be detected by the ultra violet scanning of the cuttings.

In water bore GAB5, some cuttings showed yellow-green fluorescence. Fluorescence was weak but definite and was the typical apple green uranium fluorescence. Samples of the fluorescent cuttings were taken and submitted to Australian Mineral Development Laboratories in Adelaide for x-ray. Material collected from the fluorescent areas was extracted using a diamond dental drill and examined by x-ray diffractometry. This showed the material to be quartz. Observation showed that the quartz grains were cemented by chalcedonic silica. Australian Mineral Development Laboratories commented that chalcedony and opalline silica frequently fluoresce yellow-green and that this is usually ascribed to the presence of uranium.

cont'd.../7

Cuttings from hole GAB3 were also observed to fluoresce, in this case a yellow colour. Examination by Australian Mineral Development Laboratories showed a dull orange fluorescence under both short and long-wave lamps. X-ray diffractometry determined the fluorescent material was gypsum.

Trace Element Microscopic Work

Cuttings were selected from the water bores 1, 2, 3 and 5 and were submitted for analysis to Australian Mineral Development Laboratories in Adelaide. The aim of this work was to see if geochemically anomalous metal values exist in the cuttings.

Results:

Copper

In general copper values are low, in the 20-36 ppm range, however there are a number of anomalous results for copper and also a number of slightly elevated copper results of interest. The highest result came from hole GAB5 where sample number FB 5/5 contained 990 ppm copper. Also from this hole sample number 5/4 contained 90 ppm which is weakly anomalous. Sample number 5/5 was a highly kaolinised coarse grained sandstone and was submitted for microscopic examination in polished section. Both chalcopyrite and covellite were detected in the polished section. Chalcopyrite occured as grains ranging in size from 10 to 100 microns. Covellite grains comprising less than 5% of the total copper sulphides also occur and vary in size from 20 to 70 microns.

Another anomalous result occured in hole 3, sample number FB 3/2 which contained 170 ppm copper. A further anomalous result occured in hole number 1, in sample number FB 1/3 which contained 100 ppm copper.

cont'd.../8

In addition sample number FB 5/7 from hole 5 was observed to contain abundant pyrite. This pyrite appears to cement sandstone grains in a medium to coarse grained sandstone. Microscopic examination of the sulphides was carried out to determine if other sulphides of interest occur. One grain of chalcopyrite 15 microns in size was detected in polished section as well as two grains of sphalerite, 60 to 100 microns in size.

Lead

Lead results are not anomalous and range generally between 5 and 20 ppm.

Zinc

Zinc values generally range between 18 and 80 ppm however a few distinctly anomalous results occur in hole 2. Sample number FB 2/5 contains 330 ppm zinc and sample number 2/6 contains 310 ppm zinc. These values occur associated with very slightly elevated copper values of 55 ppm. Rock type was a montmorillonite rich clay shale.

Cuttings from sample number FB 2/5 were examined microscopically in an attempt to determine the nature of the zinc minerals. Sphalerite was not detected in the polished section, however several grains of chalcopyrite approximately 5 microns in size were detected. This reflects the slightly elevated copper values. Slightly elevated zinc values also occur in hole 5, sample number FB 5/2 which contains 120 ppm zinc in a grey clay shale containing coarse grained muscovite flakes.

cont'd.../9

Molybdenum

Molybdenum results are generally less than 1 up to 1 ppm. Five samples from hole 5 have slightly elevated values of 2 to 9 ppm. Sample number FB 5/7 contained 9 ppm and this sample contained abundant pyrite cementing sandstone grains. As previously reported traces of chalcopyrite and sphalerite were detected in polished section.

Uranium

Uranium results were very low, in general around the limit of detection of 4 ppm or below. Only one sample showed a slightly elevated result of 6 ppm. Interestingly this came from hole 5, sample number FB 5/5 which also contained highly anomalous copper values of 990 ppm. Polished section also confirmed in this sample the presence of chalcopyrite and covellite.

Gold

Two samples were submitted for gold analysis. Sample number FB 5/7 which contained feebly anomalous molybdenum values associated with abundant pyrite contained 0.06 ppm gold, just above the limit of detection. The other sample contained 0.02 ppm, around the limit of detection.

cont'd.../10

Spectrographic Scan

Cuttings from hole 5, sample number FB 5/7 were submitted for qualitative spectrographic analysis to determine if any unusual elemental associations occur. Drilling fragments here contain abundant pyrite cementing medium to coarse grained sandstone grains. Slightly elevated values of molybdenum were recorded by analysis and traces of chalcopyrite and sphalerite were recorded in polished section. The spectrographic analysis showed an unusual grouping of rare elements in the very faint trace to faint trace groupings of concentrations.

Very faint traces of ytterbium, scandium, cobalt, beryllium and gallium were recorded in the 0 to 10 ppm range. Germanium, rubidium and yttrium were recorded in the faint trace range:- 10 to 50 ppm, together with the more common elements - molybdenum, lithium, vanadium, copper, chromium, lead and nickel. Zirconium and arsenic were also recorded in the faint trace range but near the 100 ppm level. No other significant minerals occur in the more abundant concentration levels.

cont'd.../11

Water Sampling

Water samples were taken from three of the bores. The aim was to check copper, uranium and molybdenum values in the bores. Bores 1, 2 and 5 were sampled. Copper values were very low, between 0.5 and 1.5 ppb. Lead results range between 3 and 6 ppb slightly above the 0.5 ppb limit of detection. Zinc results range from 7 to 10 ppb which appears to be a general background level. Uranium values were generally around the limit of detection of 1 ppm or just under and are of no significance. Molybdenum values vary between 3 and 3.5 ppb slightly above the limit of detection of 2 ppb and appear to be background levels. Copper was below the limit of detection.

cont'd.../12

7. DISCUSSION OF RESULTS

Central Coast feels that a specific target has been identified with work to date that warrants drilling. A ground gravity survey carried out has refined a regional gravity anomaly recorded on government maps. To quote from its former joint venture partner, Shell Company of Australia Ltd:-

> "The gravity=data and modelling indicate a source which is consistent with an Olympic Dam type body in terms of
> orientation (north-west)
> maximum gravity anomaly (10 milligals)
> density contrast (1.0)
> thickness (300 - 500m)
> width (4 km)
> depth to top (300m minimum)"

Shell subsequently withdrew from the joint venture after assessing the geology of the area to be unfavourable for Olympic Dam type deposits.

Central Coast's opinion is that there is additional data reinforcing the gravity anomaly. There are additional geological indications of interest in the area immediately around the gravity high as follows:-

3 water samples collected by Central Coast from seepages in this area contained highly anomalous uranium and molybdenum values. These are located on Regional Geology Sheet 1 as follows:-

FW 36	70 ppb U	80 ppb Mo
FW 5	15 " "	45 " "
FW 13	11 " "	45 " "

cont'd.../13

Seepages in these areas are probably related to quite deep fault or fracture systems and could be tapping some hundreds of metres depth as the springs continue to flow at the height of the dry season. In addition, at sample locations F27 - 30 there is strong development of massive pyrite mineralisation and massive pyrite mineralisation appears to be being deposited at present from seepages in the Hermit Hill area.

Additional indications of interest are the presence of copper and zinc sulphides in cuttings from water drilling, together with possible uranium fluorescence in the cuttings and anomalous amounts of rare earth minerals in some of the cuttings. Altogether Central Coast feels that there is a target of considerable interest in the Bopeechee area.

Based on the history of uranium discoveries in other parts of the world, Central Coast Exploration feels that substantial uranium deposits of dissimilar type to the Olympic Dam type probably also exist within about a 150 km radius of the Olympic Dam deposit and complete compatability with all Olympic Dam geological controls may not be necessary to locate a uranium orebody in the area.

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8. CONCLUSIONS

Subject to the availability of a suitable drill Central Coast plans to test the Bopeechee gravity anomaly by a deep drill hole early in 1983.

P J O'Rourke
EXPLORATION MANAGER

CENTRAL COAST EXPLORATION N.L.

21 February 1983

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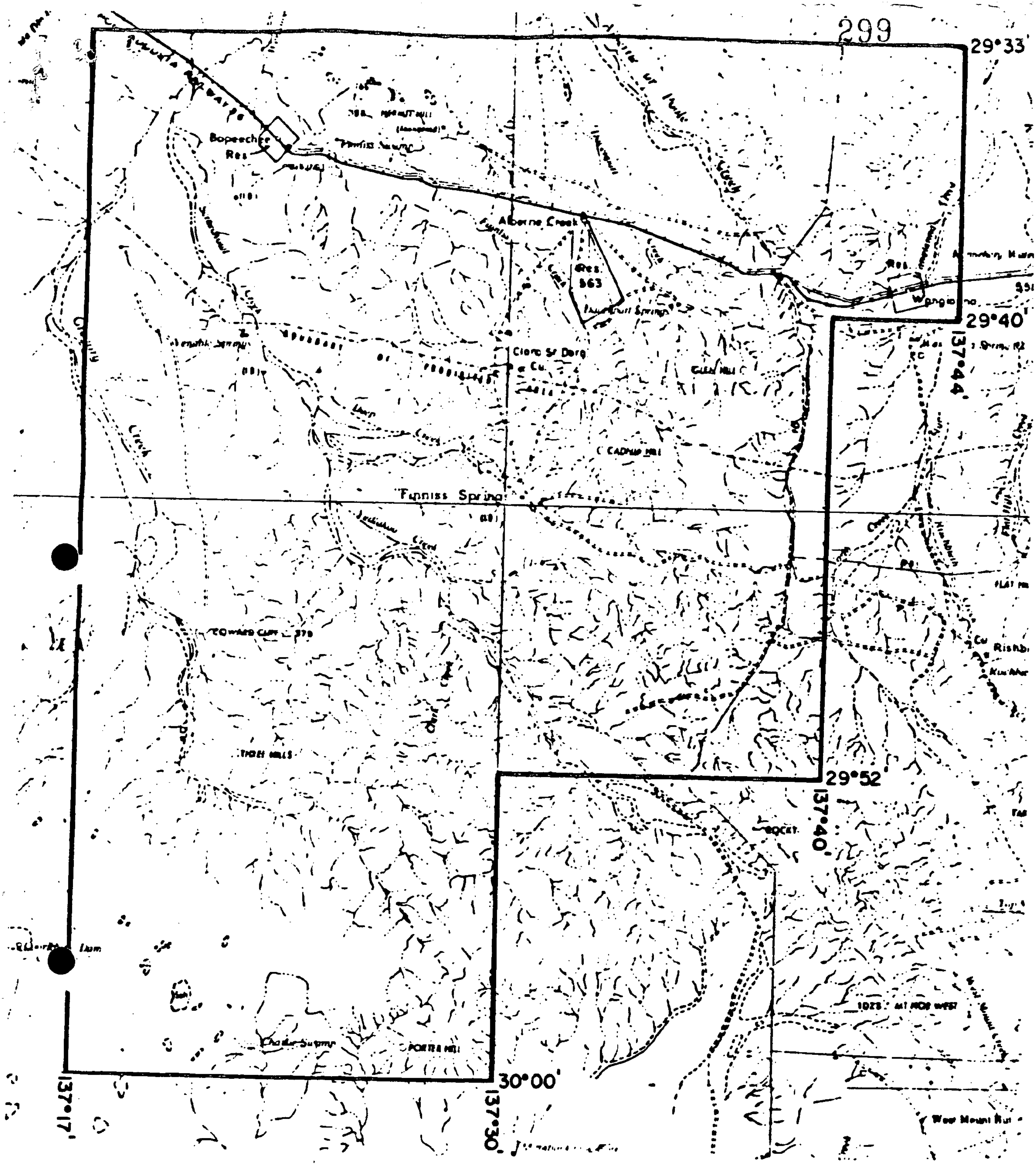
9. APPENDIX

Expenditure for the three months to 27 January 1983

Motor Vehicle Expenses	$ 510.00
Travel, Food, Accommodation	928.51
Consumable Stores	89.20
Equipment Hire	180.00
Assay	640.00
Wages and Salaries	970.00
Overheads	341.00
	$3,658.71



SCALE 1:250,000

KILOMETRES 5 0 5 10 15 20 25 KILOMETRES

CENTRAL COAST EXPLORATION N.L. E.L. 1019