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EL 796 AND EL 1120

RAWLINSON HILL

FINAL REPORT TO LICENCE SURRENDER FOR THE PERIOD 11/1/81 TO 20/3/86

Submitted by
Stockdale Prospecting Ltd
1986

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PRIMARY INDUSTRIES AND RESOURCES SA

CONTENTS ENVELOPE 6500

TENEMENT: E.L. 1120 - Rawlinson Hill.

TENEMENT HOLDER: AGIP Australia Pty. Ltd.

TITLE
#TN=EL1120; (formerly EL796) Billa Kalina. Final and relinquishment report for the period ending 20.3.86. #Env=6500
COMPANY
Stockdale Prospecting Ltd; AGIP Aust Pty Ltd;
AUTHOR
Newell, B H; #DOP=1986
ABSTRACT
355 samples were collected, using helicopters, in an area 80 km north of Kingoonya. No indicator minerals were recovered and remote sensing failed to recognise any surface expression of kimberlitic emplacement.
KEYWORDS
#SC=1345; Diamond exploration; Heavy mineral sampling; Landsat; Geomorphology; #TECT=(Stuart Shelf);
LOCALITY
Billa Kalina; Rawlinson Hill; #250=SH5311 #MAP=KINGOONYA; #100=6136; #100=6036; #100=6037:2:3; #100=6137:3;
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2 fiche, 11 pages, 2 plans; 4 fig, 2 ref,

STOCKDALE PROSPECTING LIMITED

EXPLORATION LICENCE NO 1120 (formerly EL796)

AGIP JOINT VENTURE : BILLA KALINA

FINAL REPORT FOR PERIOD ENDING 20TH MARCH, 1986

AND RELINQUISHMENT REPORT

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Project Name: BILLA KALINA

Title: EXPLORATION LICENCE NO 1120 (formerly EL796)
AGIP JOINT VENTURE : BILLA KALINA
FINAL REPORT FOR PERIOD ENDING 20TH MARCH,
1986 AND RELINQUISHMENT REPORT.

Author/s: B. H. NEWELL

Edited/Approved: H. R. ROBISON

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Date: MARCH, 1986

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STOCKDALE PROSPECTING LIMITED

EXPLORATION LICENCE NO 1120 (formerly EL796)

AGIP JOINT VENTURE : BILLA KALINA

FINAL REPORT FOR PERIOD ENDING 20TH MARCH, 1986,

AND RELINQUISHMENT REPORT.

1. INTRODUCTION

This report summarizes work undertaken by Stockdale Prospecting Limited within Exploration Licence 1120 (formerly EL796) during the period from September 1981 until March 1986. The Exploration Licence covers an area of 2500 square kilometres on the Kingoonya 1:250 000 scale map sheet (SH53-11), and is approximately 80km northeast of Kingoonya.

2. LEGAL

2.1 Title

Exploration Licence No 1120 was originally granted to AGIP Australia Pty Ltd as EL796 on 11th January 1981 for a period of 12 months and was extended for a further 12 months on 18th January 1982 (Figure 1). This licence covered an area of 2353 square kilometres. On 21st March 1983, a new Exploration Licence was granted (No 1120) for a period of one year to replace the existing licence, and it covered a slightly larger area of 2500 square kilometres (Figure 2). The Exploration Licence was extended for a further 12 months on 8th February, 1984 and for a final period of 12 months on 7th February, 1985.

2.2 Farm-in/Joint Venture

On 1st September 1981, Exploration Licence 1120 (then EL796) was subject to a farm-in agreement with AGIP Australia Pty Ltd under which Stockdale Prospecting Limited could explore for diamonds while AGIP retained the rights for all other minerals.

2.3 Memorandum of Variation

Exploration Licence No 1120 forms part of a much larger area of interest on the East Gawler Craton, in which Stockdale is conducting an integrated exploration programme. In recognition of similar geological problems throughout, the Minister of Mines and Energy consented by Memorandum of Variation dated 12th August 1982, to the amalgamation of Schedule B expenditure commitments for all licences held,

joint ventured, or under application by Stockdale within this larger region (Figure 3). The Memorandum of Variation was renewed on 13th September, 1983.

3. ACCESS

Main access to the area is via the Stuart Highway, through Woomera and then Station tracks . The licence is covered by the "Woomera Prohibited Area".

4. PHYSIOGRAPHY

4.1 Climate

The area is arid with a mean annual rainfall of 150mm, resulting mainly from summer storms, and a high average annual evaporation (3800mm). Summers are hot, with an average maximum of 35^{o}C and temperatures often exceed 40^{o}C. Winters are cool and minimum temperatures often fall below 0^{o}C.

4.2 Vegetation

Vegetation is sparse, and limited to species adapted to the arid conditions ; typically blue bush (Kochia spp) salt bush (Atriplex spp) mulga and myall (both Acacia spp).

4.3 Topography

Relief is low and lower-lying ground is indicated by clay pans and salt lakes. Higher ground generally has east facing scarps. Wind blown sand forms dunes oriented approximately east-west.

5. GEOLOGY

The generalized Stratigraphy for the Kingoonya 1:250 000 scale sheet is shown in Table 1.

The licence area is situated on the Stuart Shelf in the northern part of the Gawler Craton and to the west of the Torrens Hinge Zone (Figure 4). The area is also within, and near the south-western margin of the Great Artesian Basin and consequently Mesozoic and younger cover rocks predominate.

In this licence area at and around Lake Parakylia (GR 416205) cross bedded laminated and flaggy sandstones of the Proterozoic Tent Hill Formation occur. Some 10km to the north are scattered patchy and poorly exposed outcrops and subcrops of the Lower Cambrian Andamooka Limestone.

These flat-lying sediments of the Stuart Shelf are unconformably overlain by Permian and/or Mesozoic sediments. The Boorthanna and overlying Stuart Range and Mount Toondina

Formations are only known from drill hole and water bore information (Forbes 1977, Ambrose and Flint 1981).

The Permo-Carboniferous units are unconformably overlain by Mesozoic sediments which cover most of the licence area, although outcrop is poor. No Jurassic rocks are present, and the basal unit is the Cretaceous Cadna-owie Formation of Neocomian age, largely represented by the regressive fluviodeltaic Mount Anna Sandstone Member. This comprises predominantly medium to coarse grained sandstones with lenses of pebbles and cobbles forming conglomeratic horizons. Clasts are of white quartz, quartzite and porphyritic acid volcanics derived from the Middle Proterozoic Gawler Range Volcanics. The Cadna-owie Formation is disconformably overlain by the Aptian Bulldog Shale, a mainly shaley unit with basal bouldery and conglomeratic sandstones and calci-lutites overlain by dark grey shales and thin muddy sandstones. The top of the sequence is eroded, altered and bleached, and kaolin and gypsum are widespread and abundant.

Younger sediments overlie and largely obscure the Cretaceous rocks and include lithified Tertiary and unconsolidated Quaternary material. The Tertiary sediments are almost exclusively restricted to remnants of silcrete, usually occurring as cappings and forming positive relief. Most of these remnants are related to palaeodrainage. As the silcretes contain clasts of silcrete it is apparent that more than one episode of silcretisation has occurred.

Quaternary deposits occur as a variety of soils, colluvium, alluvium and wind blown sands, the latter forming a series of longitudinal dunes which are developed across most of the licence area.

Other widespread deposits are the fine silts and clays covering the surfaces of claypans, notably Lakes Younghusband, Reynolds and Parakylia.

6. SAMPLING

Exploration Licence No 1120 (formerly EL796) was covered by a wide ranging helicopter-supported reconnaissance sampling programme (Figure 5). Heavy mineral samples were collected at a density averaging about 1 sample per 7 square kilometres. Drainage samples were preferred and were taken where possible, but as much of the area is poorly drained, a large number of loam-scrape samples were also collected. The limits of sampling were determined by the suitability of surface material available.

At each sample location approximately 15kg of -12mesh material was collected, and a geochemical sample was also taken. The -12 mesh material was subsequently Cheers screened to give -12/+20 mesh and -20/+36 mesh fractions, from which heavy mineral concentrates were produced by Plietz jig. The concentrates were forwarded to our Melbourne Laboratory for heavy liquid separation and mineral examination.

A total of 355 samples were collected within the area covered by EL1120. No indicator minerals of kimberlitic affinity were recovered.

7. PHOTOGEOLOGICAL STUDY

Stockdale's Technical Services Division was requested to carry out an interpretation of the available aerial photography to examine the geology and geomorphology of the area and to identify any anomalous features which might represent the surface expression of kimberlitic intrusive rocks. Initially this photostudy covered the eastern portion of the Kingoonya 1:250 000 sheet (Figure 6). In order to give a regional overview the Kingoonya 1:250 000 4,5,7 colour composite Landsat Image (106/081) was also examined, and supplementary information was compiled from a literature survey (Figure 7).

Each stereopair from the aerial photography (Kingoonya, 1972, colour 1:89 000) was examined for drainage, outcrop, general geology, geomorphology and any anomalous features. This information was plotted on clear overlays and mosaiced to form a photo-interpretation map. A field visit was then undertaken to check ground truth, visit type localities and examine features of possible interest.

The area studied has a complex geomorphological history involving several erosion cycles which have produced a number of planation surfaces now covered with lag gravels. Recent sand dunes partly derived from the erosion of Lower Cretaceous sediments have migrated over this surface.

Tertiary features are post-dated and overlain by a series of longitudinal sand dunes. The dunes are generally about 6m in height, and may reach lengths in excess of 10km. They are essentially east-west trending and parallel, but are sometimes seen to converge and/or coalesce. Vegetation is fairly well developed, and the dunes may be regarded as fixed. However modification is currently occurring, through the addition of wind-borne sediments to the crests, and by deflation and the development of blow outs where vegetation is sparse. Spillage into the swales broadens the width of the dune structures.

Vegetated and bare pans are scattered throughout the interdunal corridors, and may form the foci for locally developed internal drainages. The drainage channels following the swales may terminate in small interdunal pans.

At least three drainage cycles were observed within the area examined, the earliest being the now silicified Tertiary cycle. A younger Quaternary drainage may be distinguished from this, as it is unsilicified. Both these palaeodrainages are now modified and incised by the third, current cycle. However, it is concluded that the major elements of the landscape are likely to be of long-standing, and that erosional development since the Tertiary has modified rather than drastically changed them.

8. CONCLUSION

An extensive reconnaissance sampling programme failed to recover any kimberlitic indicator minerals. Remote sensing studies failed to recognize any surface expressions of kimberlite emplacement.

9. EXPENDITURE

Expenditure for the period for which EL796 and later as EL1120 was held totalled $ 81,472 . The allocation of this expenditure is detailed in Table 2 .

B. H. Newell,
Whyalla,
February, 1986.

H. R. Robison,
Chief Geologist - South

REFERENCES

AMBROSE G.J., & FLINT R.B., 1981 : Billa Kalina, South Australia Explanatory Notes 1:250 000 geological series. Sheet SH53-7. Geol. Surv. S.Aust.

FORBES B.G., 1977 : Notes on the Kingoonya 1:250 000 Preliminary Geological Map. SADME Rpt.Bk. 77/7 (Unpubl).

Table 1:
Stratigraphy Kingoonya 1:250 000 SH53-11

0012

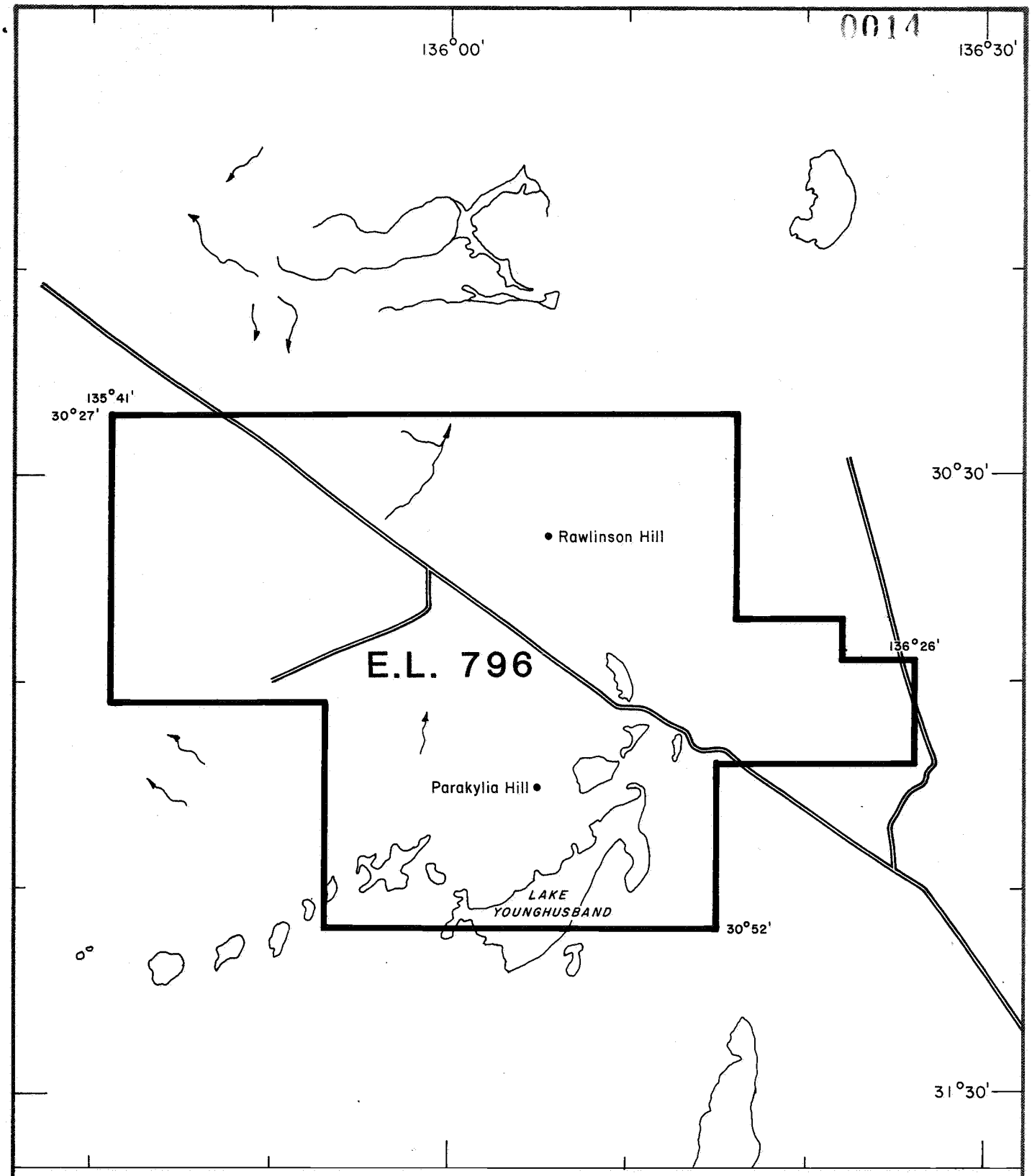
CAINOZOIC	QUATERNARY	RECENT TO PLEISTOCENE	Qrl	Pale reddish to white sand and clay of lakes, claypans, swamps; partly saline and gypsiferous.
			Qrg	White windblown gypsum marginal to claypans.
			Qra	Reddish sand, clay and gravel of drainage channels.
			Qrt	Pale reddish, brownish or dark gravels commonly composed of silcrete or ferruginous fragments.
			Qpt	Remnant older gravel sheets : Composition similar to Qrt.
			Qrn	Reddish sandy soils, lacking coarse gravel and sand ridges.
			Qrs	Reddish quartz sonds forming longitudinal dunes. (Units Qrt to Qrs commonly underlain by colcrete and "Illeroo Pedoderm" reddish sandstone)
			Qpy	Sandy pale brownish and greenish claystone, Woolnomulla Bluff.
	TERTIARY		Tmd	?ETADUNNA FORMATION: White dolomite rock and (in some places) an underlying greenish or grey claystone.
			Tsi	Pale grey, brownish or yellowish silcrete; generally only bouldery remnant. Some ferruginisation and possible silicified Tertiary sandstone with plant impressions.
MESOZOIC	CRETACEOUS	NEOCOMIAN-APTIAN	Klb	?BULLDOG SHALE : White shale, claystone or siltstone.
			Klc	?CADNA-OWIE FORMATION: Pale clayey and pebbly to bouldery sandstones; dark ferruginised coarse sandstone. (Cretaceous and some older units bleached by deep chemical weathering of Cretaceous or Tertiary age.)
PALAEOZOIC	CAMBRIAN		€	ANDAMOOKA LIMESTONE : Brown and grey limestone.
PROTEROZOIC	ADELAIDEAN		Ew	TENT HILL FORMATION : Pale brown to grey, cross-bedded flaggy sandstone (?ARCOONA QUARTZITE MEMBER).Reddish, brownish and greenish flaggy siltstone and sandstone in Beddome region.
	CARPENTARIAN		p€v	GAWLER RANGE VOLCANICS: Reddish quartz-feldspar porphyry or fine-grained volcanic rock;sometimes layered.
			p€c	?CORUNNA CONGLOMERATE : White or brownish quartzite or conglomerate; schistose diamictite (sheared bouldery siltstone) south-east of Mount Eba.
LOWER PROTEROZOIC			p€	?CLEVE METAMORPHICS: Quartzite and ironstone of Mount Eba; iron formations.
			p€g	?Granite west of Kingoonya.

after Forbes, 1977.

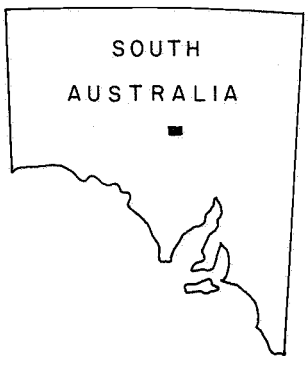
TABLE 2 : EXPENDITURE

Exploration Licence 1120 (formerly EL 796)

Technical and Supervisory Staff		$ 882
Sundry Field Expenses		18
Tenement Costs		8880
Specialist Services	: Geophysics	104
	: Drafting	26
Administration	: Regional	1917
	: Head Office	1619
TOTAL		$13446
TOTAL PREVIOUSLY REPORTED (including EL 796)		$68521
TOTAL LICENCE EXPENDITURE		$81967



LOCATION DIAGRAM



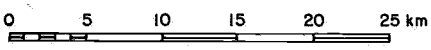


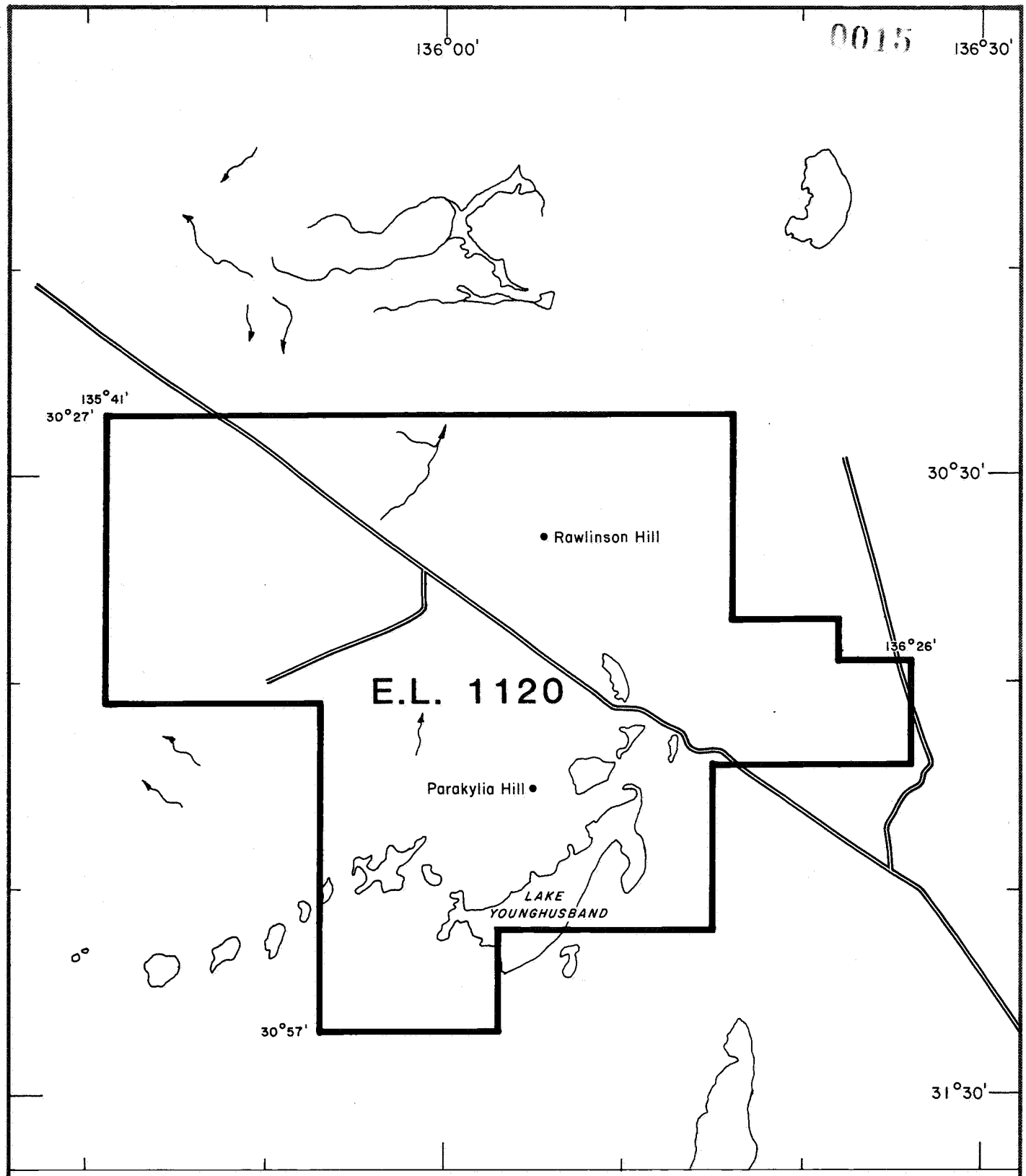
FIG. 1

STOCKDALE PROSPECTING LIMITED

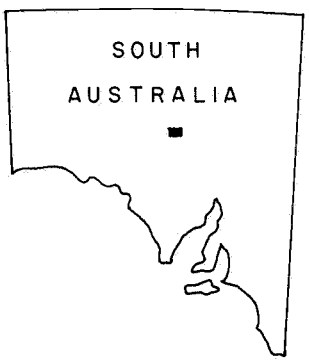
H53-11 KINGOONYA
SOUTH AUSTRALIA

E.L. 796 - BILLA KALINA LOCATION MAP

Compiled	D.O.
Drawn	S.P.W.
Date	21/3/86
Scale	1:500 000
Revised	
SEL 2717	



LOCATION DIAGRAM



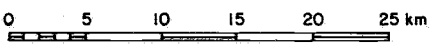


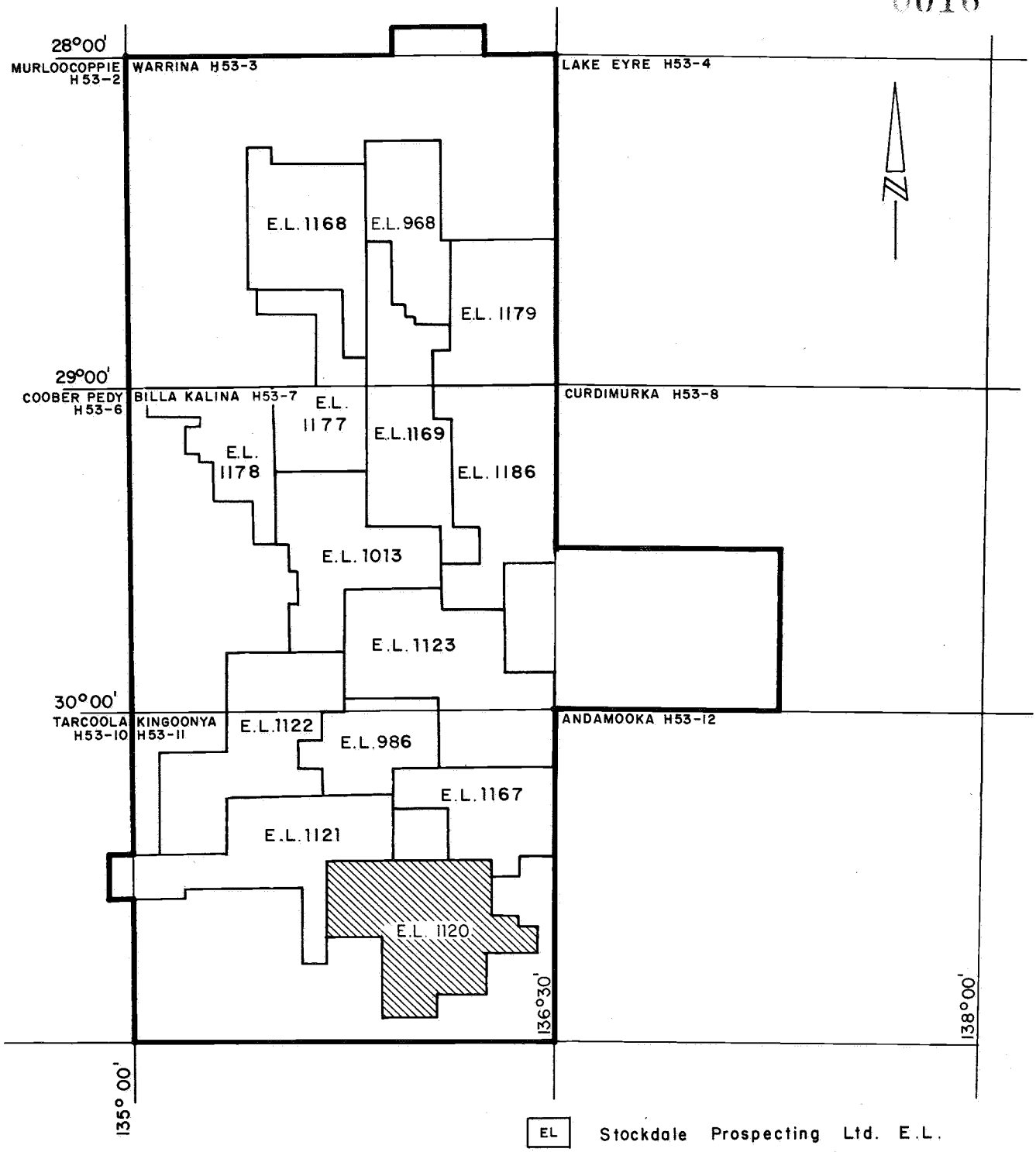
FIG.2

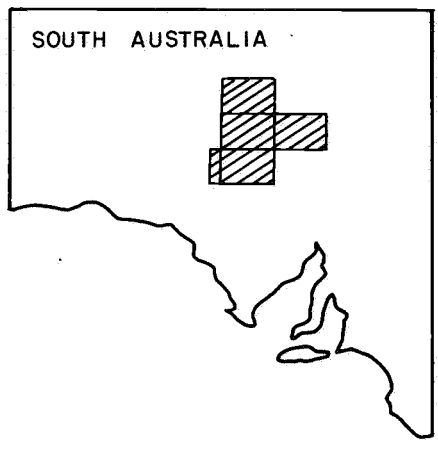
STOCKDALE PROSPECTING LIMITED

H53-11 KINGOONYA
SOUTH AUSTRALIA

E.L. 1120 - BILLA KALINA LOCATION MAP

Compiled	D.O.
Drawn	S.P.W.
Date	21/3/86
Scale	1:500 000
Revised	
SEL	2718





LOCATION DIAGRAM

BASED ON SEL 1263

FIG.3

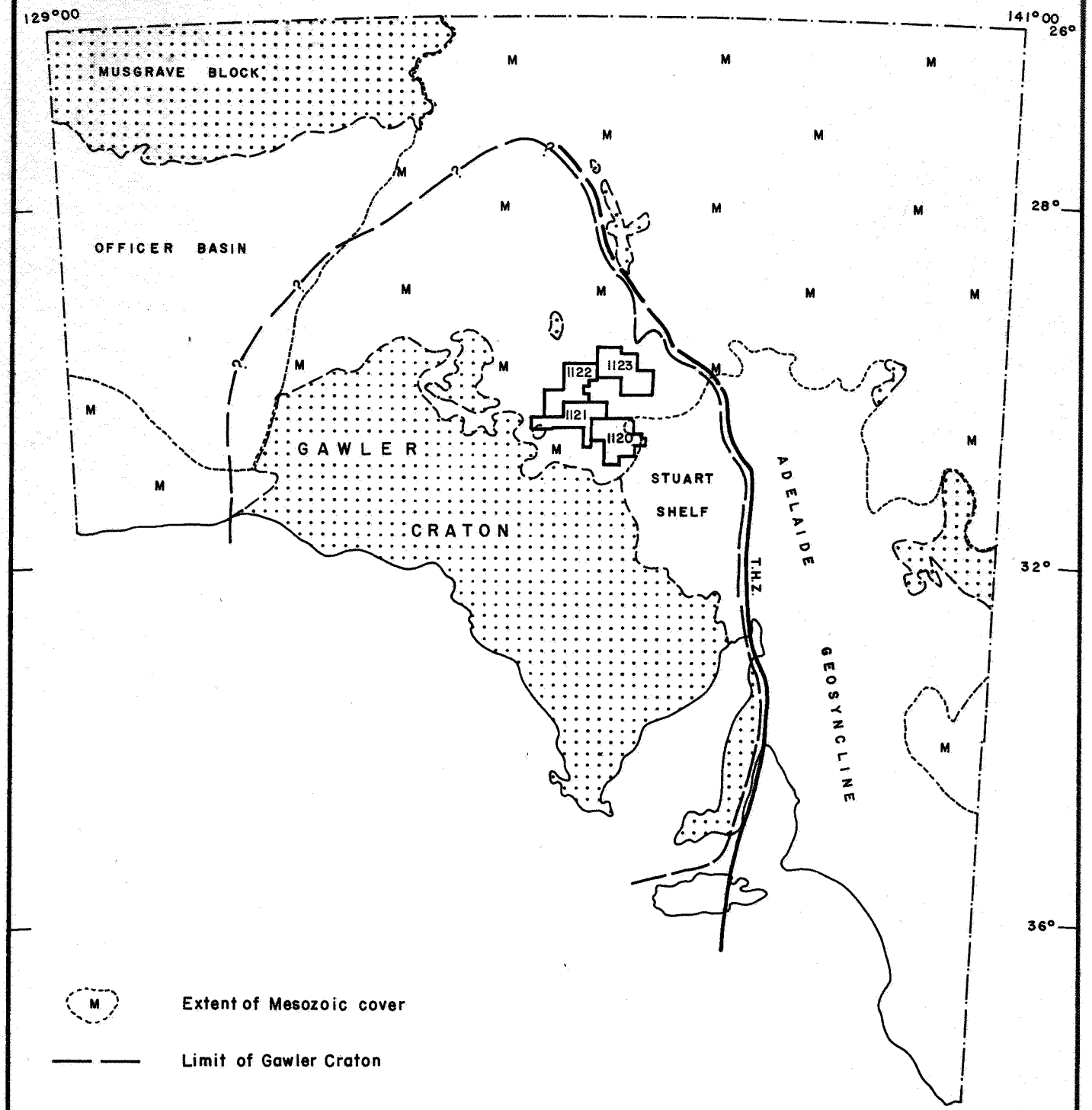
STOCKDALE PROSPECTING LIMITED

SOUTH AUSTRALIA

E.L. 1120 - BILLA KALINA

S.P.L. TENEMENTS SUBJECT TO MEMORANDUM OF VARIATON

Compiled	
Drawn	A.D.S
Date	JULY '82
Scale	1:2 MILLION
Revised	26/1/86
SEL	15916



M — Extent of Mesozoic cover

Limit of Gawler Craton

T.H.Z. — Torrens Hinge Zone

Exposed basement

797 — E.L.'s 796, 797, 798, 799

FIG. 4

STOCKDALE PROSPECTING LIMITED

SOUTH AUSTRALIA

E.L. 1120-1123 - BILLA KALINA

GEOLOGICAL SETTING

Compiled	H.R.R.
Drawn	MAK.
Date	NOV. '81
Scale	7,500,000
Revised	S.P.W. 21/3/86
SEL	1324

This map is based on the inset map on the S.A. Geological 1:1,000,000 map, S.E. sheet.

136°00'

136°30'

135°41'

30°27'

30°30'

136°26'

30°57'

31°00'

WOOMERA PROHIBITED AREA

Lake Parakylia

Lake Reynolds

LAKE YOUNGHUSBAND

Lake Patricia

0 5 10 15 20km

FIG.5

STOCKDALE PROSPECTING LIMITED	
H53-11 KINGOONYA SOUTH AUSTRALIA E.L. 1120 - BILLA KALINA SAMPLE LOCATIONS 6500-1	Compiled B.H.N. Drawn S.P.W. Date 21/3/86 Scale 1:250 000 Revised SEL 2719

136°00'

136°30'

30°30'

31°00'

TERTIARY

STRAND LINE

E.L. 1120

Lake Younghusband

Lineaments

Tertiary strand line

Lake or pan

Road

0 5 10 15 20km

FIG.7

STOCKDALE PROSPECTING LIMITED

H53-11 KINGOONYA
SOUTH AUSTRALIA

E.L. 1120 - BILLA KALINA

LANDSAT INTERPRETATION

Compiled	B.H.N., S.J.W.
Drawn	S.P.W., M.A.K.
Date	21/3/86
Scale	1:250 000
Revised	
	SEL 2721