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SML 335

SPRINGFIELD BASIN

PROGRESS REPORTS TO LICENCE EXPIRY FOR THE PERIOD 18/9/69 TO 17/9/70

Submitted by
CRA Exploration Pty Ltd
1970

Enquiries: Customer Services
Ground Floor
101 Grenfell Street, Adelaide 5000

Telephone: (08) 8463 3000
Facsimile: (08) 8204 1880

PRIMARY INDUSTRIES AND RESOURCES SA

CONTENTS ENVELOPE 1251

TENEMENT: S.M.L. 335

TENEMENT HOLDER: CRA Exploration Pty. Ltd.

00003

C.R.A. EXPLORATION PTY. LIMITED.

14th November, 1969.

Memorandum to : A.F. McQUEEN

copy : C.L. Knight

from : G.F. Pigott

Reconnaissance Survey in Special Mining Lease 335, Springfield, South Australia

SUMMARY

Scintillometer traverses were carried out over the area of the Springfield Coal Basin, and 6,000 feet of percussion and diamond drilling samples collected in 1958-59 were scanned with a scintillometer. A fresh unleached section of a sandstone in the basal beds gave radioactive values of $2\frac{1}{2}$ times background. A slightly anomalous section of $1\frac{1}{2}$ times background was found over arenaceous and carbonaceous beds higher up in the succession. Sandstones exposed at the surface were found to be decomposed, leached and only faintly radioactive compared with interbedded siltstones. Further work is recommended to investigate the radioactive occurrences.

INTRODUCTION

The presence of a thick basal clastic series, together with interbedded carbonaceous and arenaceous beds, in the Springfield Coal Basin makes the area one of interest as being a suitable environment in which a solution front type of uranium deposit could have formed. Samples from twenty two bores drilled by Mines Department in 1958-1959 were scanned with a scintillometer and scintillometer traverses were carried out over certain sections of the basin.

LOCATION AND ACCESS

The area covered by the lease lies within the Orroroo 1 : 250,000 sheet SI 54-1. It lies 30 miles northeast of Quorn by road and 14 miles south of Hawker. Access is by a rough track between the abandoned railway siding of Gordon and the town of Cradock from which the area is 13 miles by road. The area occupied by the basin forms a slightly undulating depression in a region of moderate relief.

GEOLOGY

The sediments of the Springfield Basin occur in an intermontane basin measuring $2\frac{3}{4}$ by $1\frac{1}{4}$ miles elongated in a northeast-southeast direction. It is bounded by sedimentary and cataclastic rocks of the Proterozoic Adelaidean Appila Tillite, and the Topley Hill Formation (1). The following succession with thicknesses has been recognised by Johnson (2) :

(?) Tertiary-Quaternary

0-20 feet: Calcrete cemented boulder conglomerates overlain by sands, clays and interbedded pebble lenses.

Triassic

Baked Argillites 70-90 feet: a sequence of mudstones containing freshwater molluscs and plant remains baked by a burning coal seam of the underlying beds.

Upper Coal Measures 350 feet: generally an arenaceous sequence with impure coal seams which have been fused.

Upper Sandstone Beds 125-140 feet: Leached and weathered soft yellow sandstones, medium-coarse grained clasts mainly of well rounded quartz, interbedded with concretionary limonite ironstones and ferruginised shales.

Lower Coal Measures 200-700 feet: carbonaceous and ferruginous shales, coal seams and limonite ironstones.

Lower Sandstone Beds 180-340 feet: Current bedded siltstones with mud flake breccias and fine-medium grained current bedded sandstone lenses. Very leached and decomposed.

Red Argillite 0-430 feet: Red massively bedded mudstones and siltstones.

Basal Conglomerate 0-600 feet: unsorted boulder conglomerates with red siltstones, red shales mud flake breccias and medium-coarse sandstones. The lowest conglomerate horizons contain only Adelaidean clasts, higher units contain uncleaved red shales and mudstones.

Basal shales 200 feet: grey shales.

UNCONFORMITY

Adelaidean

Cleaved grey siltstones and mudstones, coarse psammitic tillite and mylonites.

The sediments are folded in the form of a crescent shaped assymmetric syncline downwarped into a basin with radial and tangential faults (2). The deformation is probably of Quaternary age.

INVESTIGATION

The area underlain by the basal arenaceous beds was traversed and the radioactivity noted at 100 foot centres using a Scintrex BGS-1S scintillomter. Some higher radioactivity was found to be in areas underlain by rocks further up in the sequence; a series of traverses were carried out over the centre of the basin. Rock samples were collected for assay.

RESULTS

The samples from the twenty-one 200 feet percussion drill holes and the 1140 foot stratigraphic test hole drilled in 1958-59 were scanned using a scintillometer in the South Australian Department of Mines core shed at Thebarton in Adelaide. It was found that the clastic sediments underlying the Lower Coal Measures gave only background values of radioactivity. However, there was only 2 feet of core representing the basal conglomerate. 2 times background values were obtained from a 5 foot section at 290 feet in hole 1A and a 3 foot section at 120 feet in hole 6. The lithology in both holes was the same - grey laminated siltstone occurring approximately 110 feet below the boundary between the Lower Coal Measures and the Upper Sandstone beds.

The scintillometer traverses across the succession did not locate the radioactive siltstone mentioned above, nor could it be located in outcrop. It was found, however, that an area overlying part of the Upper Sandstone Beds and the Upper Coal Measures gave radioactivity values of up to $1\frac{1}{2}$ times background. The beds are very ferruginised with concretionary limonite and limonite-filled joints and fissures widely developed. The sandstones are leached and soft and almost decomposed. The area occupied by the central mesa composed of Baked Argillite overlying ferruginised beds of the Upper Coal Measures, also gave readings of $1\frac{1}{2}$ times background but this is probably due to the mass effect of the topography.

The area in the northeast of outcropping arenaceous and argillaceous beds gave radioactive values of 30-50 c.p.s. Readings of up to 60 c.p.s were obtained from red siltstones in the basal conglomerate and Lower Sandstone Beds. Ferruginised and leached sandstone horizons were only faintly radioactive.

A 6 foot sequence of well bedded red quartz sandstone and red siltstones, exposed in the Slately Cliffs Creek on the northwest boundary of the basin, gave radioactive values of $2\frac{1}{2}$ times background. This sequence occurs 15 feet above the unconformity between the Appila Tillite and the coarse boulder conglomerate of the basal Triassic. The section is only radioactive where it is relatively unleached and has been exposed due to recent downcutting by the creek. The same sequence exposed on the hillside gives values of 40 c.p.s for the sandstone and 60-70 c.p.s for the siltstone compared to 130 c.p.s in the unweathered section.

CONCLUSIONS AND RECOMMENDATIONS

An unweathered section of basal sandstone was found to give radioactive readings of $2\frac{1}{2}$ times background; the same sandstone sequence where it has been leached gave only background values. A slightly anomalous section parallel to the strike was located down dip from the radioactive basal beds overlying ferruginous and carbonaceous rocks of the upper part of the sedimentary sequence. It is recommended that further work be carried out to examine the possibility that radioactive material leached from the weathered sandstones might be concentrated at depth down dip from the radioactive anomalous section exposed in Slately Cliffs Creek.

G.F. Pigott

GFP:jp

REFERENCES

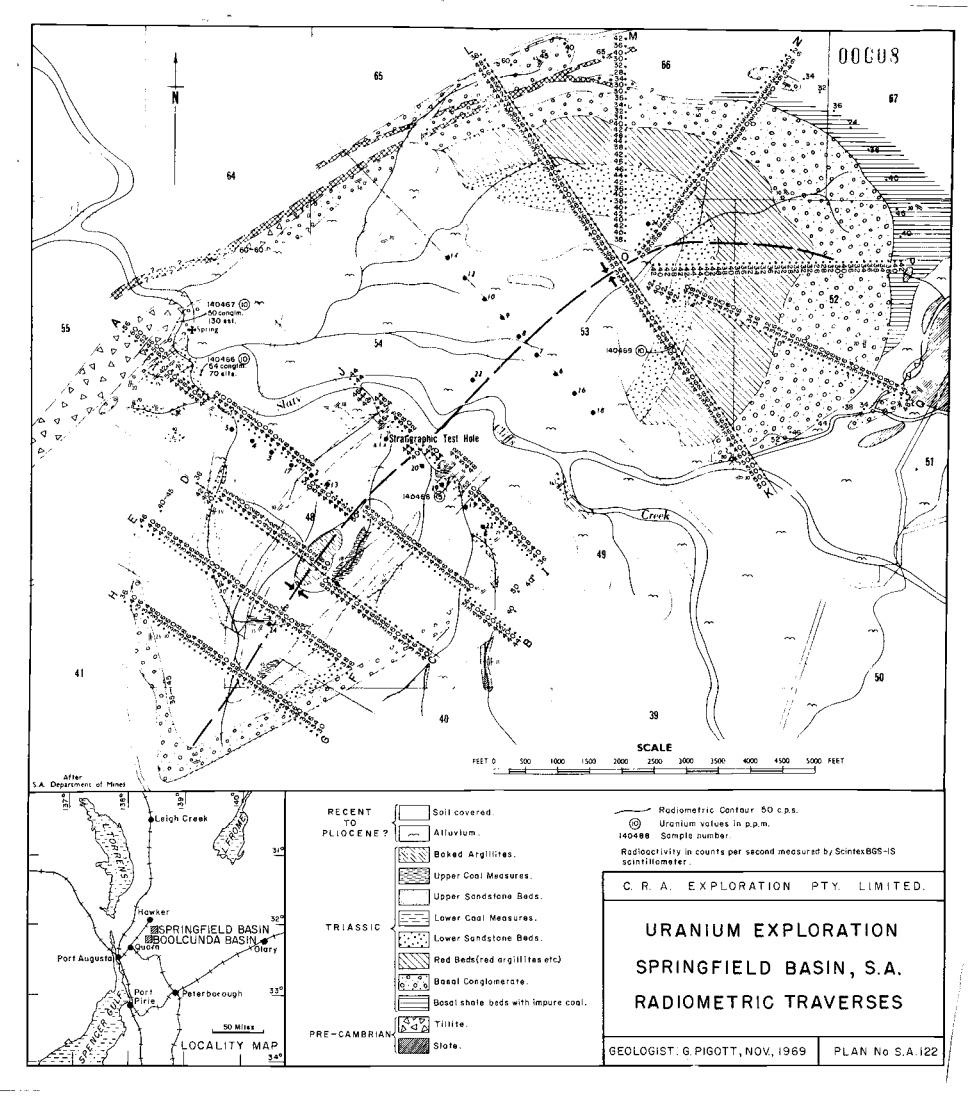
(1)	Geol. Surv. of S.A.	1958	Orroroo 1 : 250,000 Sheet SI 54-1.
(2)	Johnson, W.	1960	"Exploration for Coal Springfield Basin in the Hundred of Cudla-Mudla, Gordon-Cradock District". Rep. Invest., Geol. Surv. of South Australia, 16:62p.

KEYWORDS

Reconnaissance, uranium, coal measures, Triassic, radiometric, sedimentary.

PLAN

No.		Scale
SA 122	Radiometric Traverses, Uranium Exploration, Springfield Basin, South Australia.	1500' : 1'



After S.A. Department of Mines

RECENT TO PLIOCENE?
- Soil covered.
- Alluvium.

TRIASSIC
- Baked Argillites.
- Upper Coal Measures.
- Upper Sandstone Beds.
- Lower Coal Measures.
- Lower Sandstone Beds.
- Red Beds(red argillites etc)
- Basal Conglomerate.
- Basal shale beds with impure coal.

PRE-CAMBRIAN
- Tillite.
- Slate.

Radiometric Contour 50 c.p.s.

(10) Uranium values in p.p.m.

140488 Sample number.

Radioactivity in counts per second measured by Scintrex BGS-1S scintillometer.

C. R. A. EXPLORATION PTY. LIMITED.

URANIUM EXPLORATION SPRINGFIELD BASIN, S.A. RADIOMETRIC TRAVERSES

GEOLOGIST: G. PIGOTT, NOV., 1969 | PLAN No S.A.122

C.R.A. EXPLORATION PTY. LIMITED

October, 1970.

Memorandum to : A.F. McQUEEN

Copies : D.S. Carruthers
C.L. Knight

From : A.K. Hodgkin

Scout Drilling for Sedimentary Uranium, S.M.L. 335, Springfield Basin, South Australia.

SUMMARY AND RECOMMENDATIONS

The Triassic sediments of the Springfield Basin were considered to be possibly favourable environments for the formation of roll-front uranium deposits. Previous scintillometer traverses showed anomalous radioactivity, particularly in the west of the basin. Two holes were rotary drilled and gamma logged down dip of the anomalous outcrops. These holes did not intersect unusually radioactive sediments and the lithologies drilled do not appear to be suitable for large-scale ore formation. Relinquishment of the S.M.L. is recommended.

LOCATION AND ACCESS

The Springfield Basin is located in hilly country of the South Flinders Ranges, about 14 miles south of Hawker (see inset on Plan. S.A. 141). Access is by a graded road either from the Hawker-Quorn road on the west or the Hawker-Orroroo road on the east.

GEOLOGY

(Refer Plan S.A. 141)

For a full account see Johnson, 1960.

The Springfield Basin is a folded sequence of Triassic terrestrial and lacustrine sediments, some of which are highly carbonaceous, lying within the Proterozoic rocks of the Adelaide System. It was probably originally part of a larger basin and has been preserved by a combination of folding and faulting. The folding has formed an asymmetrical basin of 3.5 square miles with a south-curving northeast axis.

Deposition probably took place in an intermontain basin, with climate changing from arid (red bed deposition) to sub-tropical (coal measures).

The Triassic succession is as follows: (per Johnson, page 6)

Baked Argillites:	Pink and buff baked mudstones, fresh water fossils, baked by a burning coal seam (70 to 90 feet).
Upper Coal Measures:	Grey sandy shale, fine grained sandstone with coarse arkose or greywacke at top; carbonaceous shales, argillites and siltstones with impure coal seams (350 feet).
Upper Sandstone Beds:	White to yellow siltstone or fine grained micaceous sandstones with interbedded carbonaceous shales and impure coal seams; some coarse sandstones (125 to 140 feet).
Lower Coal Measures:	Carbonaceous shales and argillites with impure coal seams (200 to 700 feet).
Lower Sandstone Beds:	Red, mauve and buff, fine to coarse grained sandstones, in places arkosic and with clay pellets (180 to 340 feet).
Red Argillite:	Chiefly red to chocolate structureless argillite. Some interbedded sandstone and siltstones (0 to 430 feet).
Basal Conglomerate:	Interbedded torrential conglomerate and mauve to buff and purple coarse to very coarse, current bedded sandstone. Pebbles and boulders mainly quartzite (0 to 600 feet).
Basal Shales:	Grey to yellow shales with carbonaceous beds (0 to 200 feet)*.

(Total thickness: 1,135 - 2,850 feet)

The underlying Precambrian rock is, in the area drilled, a tillite.

The Springfield Basin appears to be a suitable environment for the formation of uranium ore roll deposits, in spite of the lack of obvious source rocks for the uranium. In particular, the existence of carbonaceous and pyritic sandy beds in the Lower Coal Measures, Lower Sandstone Beds and perhaps the Red Beds is encouraging.

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* Not present in area drilled.

PREVIOUS WORK

(a) In 1958 and 1959 the South Australian Department of Mines carried out a thorough surface mapping and drilling program in order to test for economic deposits of coal. Seams were thin, discontinuous and impure (Johnson, 1960).

(b) In 1969 G.F. Pigott carried out scintillometer traverses across the basin and scanned the samples from the Department of Mines' drilling program. Some anomalous results were found, both surface and subsurface. The most promising area was on the central western edge of the basin, where an outcrop of red quartz sandstone and siltstone 15 feet above the Precambrian basement gave readings of $2\frac{1}{2}$ times background (G.F. Pigott, 1969).

Another anomalous section was found in 1970 by G.F. Pigott and A.F. McQueen (personal communication, A.F. McQueen) in the same area.

PRESENT SURVEY

In September, 1970 two holes (SFB 1 and 2) were rotary drilled to basement. These were located 530 feet apart, approximately down dip from the two radioactively anomalous outcrops. The map shows the location of the holes.

The holes intersected the lower part of the Triassic sequence (252 and 222 feet thick in SFB 1 and 2 respectively). Brief lithological descriptions of the holes are given on page 4.

Methods Used

1. Samples collected and described every ten feet.
2. Samples scanned with Scintrex B.G.S.1 scintillometer.
3. Hole logged for gamma rays, self potential and resistivity. Logging machine and operator were from the South Australian Department of Mines.
4. One sample was sent to The Zinc Corporation for uranium assay and one sample of basement was sent to A.M.D.E.L. for heavy mineral identification.

Drilling Information

Contractor: Department of Mines, South Australia.

Machine: Truck-mounted Mayhew 1000 rotary drill rig.

Conditions: Hard rock bit used throughout.

SUMMARY LITHOLOGS

For detailed logs, refer Appendix.

Hole No.	Footage	Description	Unit
SFB 1	0 - 26	Brown and grey gravels, sands, silts and muds.	Alluvium
	26 - 126	Medium to pale grey carbonaceous mudstone, siltstone and sandstone, especially sandy below 64 feet.	Lower Coal Measures(?)
	126 - 159	Mixture of grey and brown mudstones and siltstones.	Lower Sandstone Beds and Red Beds (?)
	159 - 176	Pale and dark grey siltstones and mudstones.	
	176 - 195	Mainly red-brown sandy siltstones and mudstones.	
	195 - 236	Pale grey to black shales and mudstones.	
	236 - 282	Mixture of red-brown and pink-grey siltstones and mudstone; minor black shale.	Basal Conglomerate (?)
	282 - 283½	Silicified quartz gravel. Very hard.	Precambrian tillite.
SFB 2	0 - 36	Brown and grey gravels, sands, silts and muds.	Alluvium
	36 - 67	Mainly grey sandy siltstone.	Lower Coal Measures(?)
	67 - 114	Mixture of grey and brown mudstones and siltstones.	Lower Sandstone Beds and Red Beds(?)
	114 - 126	Pale grey sandy siltstone.	
	126 - 174	Mixture of red-brown, grey and black siltstones.	
	174 - 227	Mainly deep brown mudstone and siltstone, minor pale grey mudstone.	
	227 - 262	Very pale grey sandy siltstone; trace gravel	Basal Conglomerate
	262 - 270	Silicified coarse quartz sand. Very hard. Analysis showed heavy minerals to be pyrite, siderite and quartz.	Precambrian tillite.

82.30 m

Unit identification and correlation are very tentative.

Assay Results

Sample No. 141407, 140' - 150', SFB2 - 8 ppm U.

Gamma Log Results

Refer Appendix for details.

Only one significant gamma kick was recorded; this was in SFB 2 at 141' to 144', five times surface background. It occurrs in a pale grey mudstone, at the base of a dark grey mudstone with traces of carbon and pyrite. It is doubtful if this kick can be correlated with the surface anomalies, and it is not large enough or in a suitable rock type to warrant further drilling.

CONCLUSIONS

The two holes drilled did not intersect any thick and lithologically favourable sandstones; most sands were both too thin and too impermeable for the formation of economic deposits of uranium of the western United States type. The gamma logs confirm the unfavourability of the area.

In addition, the basin is small (3.5 square miles) and has been thoroughly drilled (refer Plan S.A. 141). The drill chips and core have been scanned by a scintillometer with negative results. It is unlikely that an economic uranium deposit could exist in the small undrilled area.

Relinquishment of the S.M.L. is recommended.

A.K. Hodgkin

AKH:dc

REFERENCES

Johnson, W.	1960	Exploration for Coal, Springfield Basin. Department of Mines, South Australia Report of Investigations No. 16.
Pigott, G.F.	1969	Reconnaissance Survey in S.M.L. 335, Springfield, South Australia. C.R.A.E. Report (unpublished).

KEYWORDS

Uranium, sedimentary, Triassic, drilling - rotary, logging-gamma.

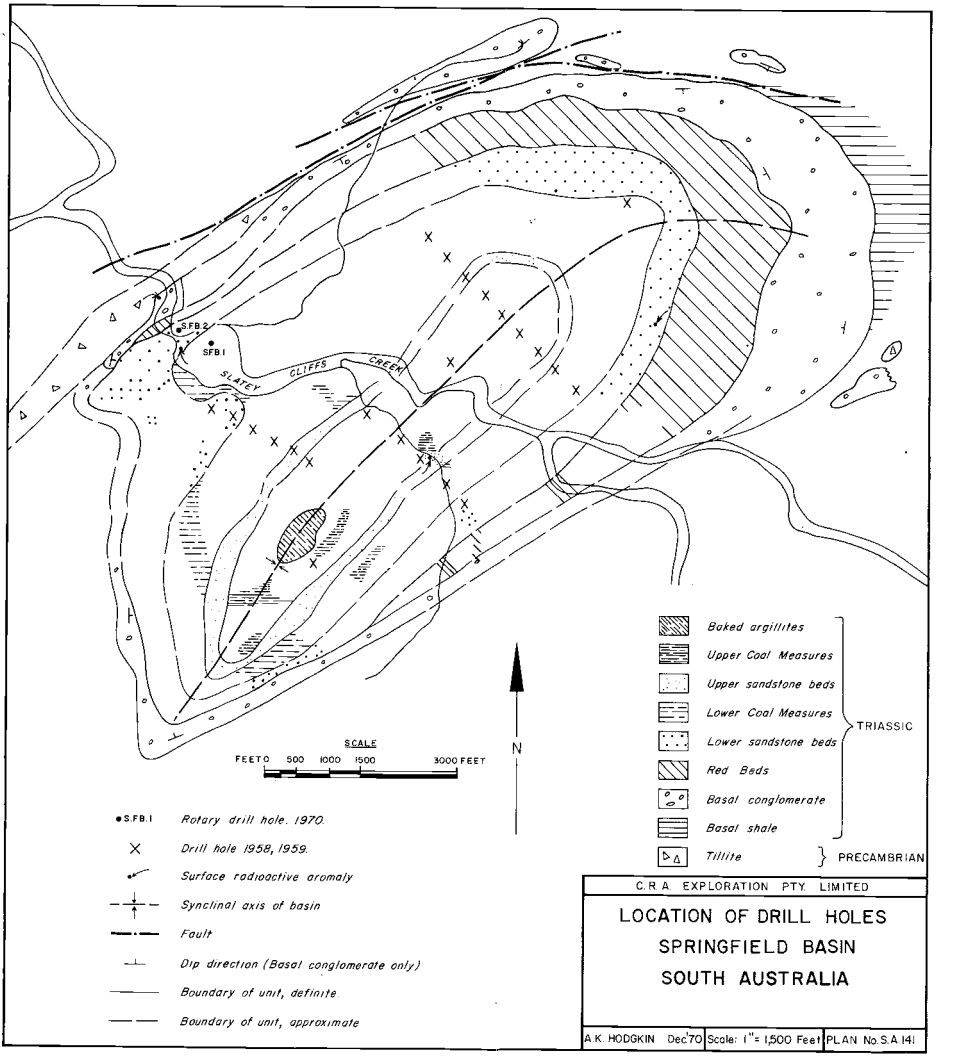
Locality: Orroroo SI54-1 1:250,000 map sheet.

PLAN

		Scale
S.A. 141	Location of Drillholes, Springfield Basin, South Australia.	1" = 1,500'

APPENDIX

Detailed Lithologies of SFB1 and SFB2.
Gamma Logs and Electric Logs of SFB1 and SFB2. (Plans S.A. 142 - 147).



C.R.A. EXPLORATION PTY. LIMITED

LOCATION OF DRILL HOLES SPRINGFIELD BASIN SOUTH AUSTRALIA

A.K. HODGKIN Dec'70 | Scale: 1"= 1,500 Feet | PLAN No. S.A. 141

CRA EXPLORATION PTY. LIMITED. CRAE FORM No. 77

ROTARY CUTTINGS LOG. 00016

BORE NO. SFB 1. LOGGED BY A.K.H

DRILLING COMMENCED 21/7/70 COMPLETED 23/7/70. LOCATION SPRINGFIELD BASIN, SOUTH AUSTRALIA. RADIATION DETECTOR Scintrex B.G.S.1.

DEPTH From	DEPTH To	PERCENTAGE LOG	CARBON %	CARBON T	CARBON Nil	PYRITE %	PYRITE T	PYRITE Nil	RADIO-ACTIVITY	POROSITY G	POROSITY F	POROSITY P	POROSITY T	MATRIX Arg	MATRIX Calc	MATRIX Sil.	DESCRIPTION OF LITHOLOGY
					✓			✓	40					✓	✓		Brown lithic sandy silt 0-2. Regolith.
0	10				✓			✓	41					✓	✓		2-8 Yellow-brn grey gravelly silt. 8-10 Pale brown grey silty mud
10	20			?				✓	41					✓			as above, becoming yellow grey.
20	30		10	.			✓		39					✓			20-26 as above; 26-30 Medium-grey carbonaceous mud.
30	40		10				✓		39					✓			as above.
40	50		10				✓		39					✓			as above; T yellow brown sandy silt - lim nodules.
50	60		5				✓		39					✓			as above; pale grey, hard
60	70		5					✓	40					✓			as above; at 64 becomes sandy, less carbon
70	80			✓	✓			✓	41					✓			as above; no carbon; gets harder, at 74 becomes silty mud.
80	90		5	✓			✓	✓	41					✓			as above; medium grey, carbonaceous, sandy patches.
90	100		5				✓		39					✓			as above; still T lenses yellow brown silty mud; ~~poor~~ Poor after 98.
100	110			✓				✓	40					✓			as above; back to medium grey.
110	120			✓				✓	39					✓			as above;
120	130			✓				✓	38					✓			120-126 as above; 126-130 purplish-brown sandy silt; minor grey clay.
130	140			✓				✓	37					✓			130-140 Mixture of pale grey sands + silts, and brown muds + silts. Thin bedded
140	150			✓				✓	40					✓			as above; mottled grey + red brown silts. Laminite stringers ~~159-160 as below~~
150	160			✓				✓	38					✓			as above; more muddy. 159-160 as below
160	170			✓				✓	40					✓			Dark to pale grey silty mud; paleness increases with depth.
170	180			?				✓	39					✓			170-176 as above; 176-180 Red-brown mud mixed with grey.
180	190			✓				✓	39					✓			as above.
190	200			.				✓	38					✓			as above. Mixture of red-brown, brown + grey sandy silts + muds to 195 thin beds
200	210				✓		✓		40					✓			195-210 Pale grey sandy silt, + minor medium grey pyritic silt. Sand beds.
210	220			?	.			✓	40					✓			210-211 as above; 211-220 Black shale - to medium grey. Pyritic bands.
220	230			?				✓	41					✓			as above. 228-231 Gamma kick (3 × bg)
230	240			?	✓		✓	✓	42					✓			230-236 as above; 236-240 Mixed red-brown + pink-grey silty muds (Hard)
240	250				✓		?✓		43					✓			as above; mostly red brown; some mottled yllw-brn clay + Poor samples.
250	260				✓		✓		41					✓			as above, but ~~silty~~ muddy silt, mainly red brown. 30% Dk grey shale
260	270				✓		✓		41					✓			as above; yellow brown silty mud appears, little dark grey
270	280				✓		✓		41					✓			as above; grey mottling appears at 278.
280	282				✓		✓		41					✓	~~✓~~	✓	0-282 as above; 282-283'6" Silicified quartz gravel. Verghad. basement.

283'6" END OF HOLE.

T = Trace, G = Good, F = Fair, P = Poor, Arg = Argillaceous, Calc = Calcareous, Sil = Siliceous

CRAE PLAN No. MZ93 SB142

CRA EXPLORATION PTY. LIMITED. CRAE FORM No. 77

ROTARY CUTTINGS LOG 00017

BORE NO. SFB 2 LOGGED BY A.K.H.

DRILLING COMMENCED 24/7/70 COMPLETED 26/7/70 LOCATION SPRINGFIELD BASIN SOUTH AUSTRALIA RADIATION DETECTOR Scintrex BGS 1.

DEPTH From	DEPTH To	PERCENTAGE LOG	CARBON %	CARBON T	CARBON Nil	PYRITE %	PYRITE T	PYRITE Nil	RADIO-ACTIVITY	POROSITY G	POROSITY F	POROSITY P	POROSITY T	MATRIX Arg	MATRIX Calc	MATRIX Sil.	DESCRIPTION OF LITHOLOGY
0	10				✓			✓	40					✓			Poorly sorted silty mud; brown.
10	20				✓			✓	38					✓			0-8 as above, 8-10 as below
20	30			✓			·	✓	38					✓			8-20 Pink grey mottled gravelly and sandy silt or mud.
30	40			✓				✓	40					✓			as above
40	50				✓			✓	38					✓			30-36 as above, 36-40 Pale grey sandy silt
50	60				✓			✓	39					✓			as above 45-52 brown muddy silt
60	70				✓			✓	38					✓			as above 52-62 pale grey sandy silt, ~~62-67 Hard med. grey silty sand~~
70	80				✓			✓	38					✓			60-62 as above. 62-67 Hard med. grey silty sand; 67-70 Red-brown mudstone.
80	90				✓			✓	41					✓			as above, ~~70-78~~ lenses? of pale grey clay. 78-80 As below.
90	100				✓			✓	42					✓			~~as above~~, 78-94 pale to medium grey shale, siltstone. ~~94-98~~ Brown
100	110				✓			✓	3942					✓			~~Mixture~~ Mixture of pale to medium grey + brown muds + silts
110	120				✓			✓	~~42~~ 39					✓			~~as above~~; very variable mixture of grey + brown silty mudstone + sand
120	130			?	✓		?	✓	39					✓		?	as above, red brown 112-114, 114-120 very pale grey sand; may be conglomeratic
130	140			✓	✓		?		42					✓			as above to 126; 126-130 medium grey mudstone, pyrite + carbon.
140	150			✓			✓		40					✓			as above, dark grey. 141-144 Gamma kick x 569
150	160			✓			✓		42					✓			as above; ~~to~~; 140-143 pale grey mudstone, then red-brown, then dark grey
160	170			✓				✓	40					✓			as above; yellow brown from 147-151? becomes pinkish brown; black shale T
170	180			✓				✓	38					✓			as above red brown silty mud, traces pale grey, dk grey shale.
180	190			✓			✓	✓	41					✓			as above - a great mixture. Mostly deep brown mudstone from 174.
190	200			✓				✓	38					✓			as above 182-186 pale grey sandy silt. 186-197 deep brown mudstone
200	210			✓				✓	40					✓			as above 197-198 pale grey sandy silt, 198-200 slightly variable deep brown shale
210	220			✓				✓	38					✓			as above, trace pale grey silt (?)
220	230			✓			✓		39					✓			220-227 as above 227-230 pale grey siltstone, + sand. T black shale
230	240			✓			✓		40					✓			as above, T gravel (quartz).
240	250			✓			✓		38					✓			240-248 as above; 248-249 great mixture; 249-250 Hard deep brown silt
250	260			✓			✓		38					✓		✓	250-251 as above; 251-260 V. pale grey sandy silt.
260	270			✓			✓		36					✓		✓	260-262 as above. 262-270 Silicified medium grey coarse quartz sand; very hard. Gravel is quartzite, shale etc
																	270 END OF HOLE.

ASSAY RESULT 141107 120-150

T = Trace, G = Good, F = Fair, P = Poor, Arg = Argillaceous, Calc = Calcareous, Sil. = Siliceous

CRAE PLAN No. M243 SA143

00018

TYPE OF LOG (S): S.P & Point Resistivity 16" & 64"

DATE: 23/7/70 TIME: 1700 hrs / 1725 hrs /

AREA: Springfield Basin SA LOCATION: Lat. Long.

WELL: S.F No. 1

ELEVATION G.L. K.B.: Log from feet above G.L. DEPTH SCALE:

RUN NUMBER: 2 / / /

1ST READING 278 / / / / LAST READING: 0 / / / /

CASING SHOE DEPTH (1) LOG feet (2) feet TOTAL DEPTH LOG feet DRILL feet

MUD: Type Density lb/gal Resistivity @ °F BHT @ °F

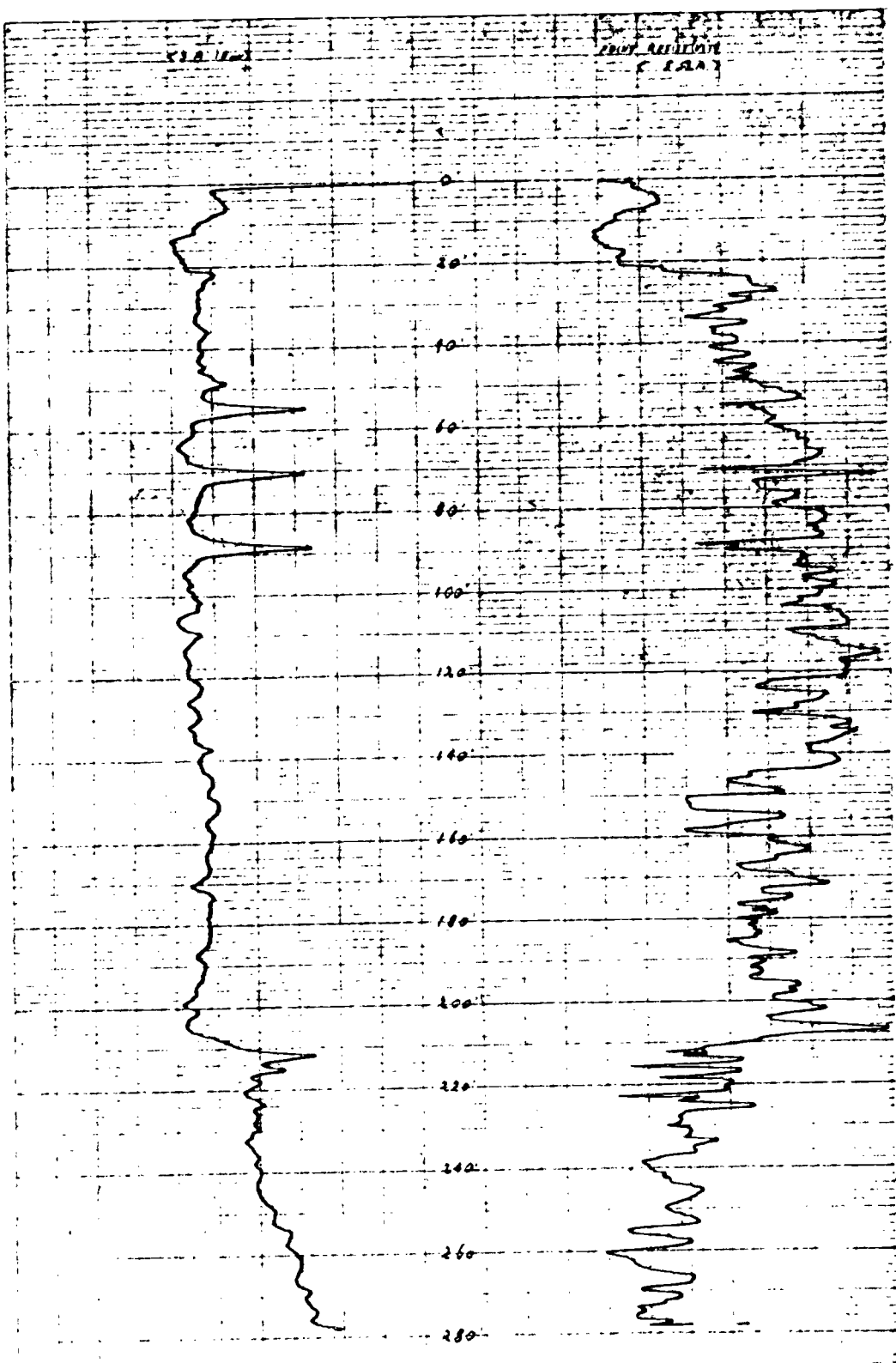
pH Fluid Loss cc/30 min @ °F R_{mf} @ °F

BIT SIZE: " ADDITIONAL CASING feet

OPERATING TIMES: 25 min / /

RECORDED BY: B.A.C. BRICE

REMARKS:



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P.N. 144

GEOLOGICAL SURVEY

TYPE OF LOG (S): GAMMA 50 CPS

DATE: 23/7/70 TIME: 1635½ / 1655½

AREA: Springfield Basin SA LOCATION: Lat: , Long:

WELL: S.F. No 1

ELEVATION G.L.: K.B.: Log from feet above G.L. DEPTH SCALE:

RUN NUMBER: / / / / /

LAST READING: 296' / / / / FIRST READING: 0' / / / /

CASING SHOE DEPTH ("): LOG feet D.L. feet TOTAL DEPTH LOG feet DR LOG feet

MUD: Type Density Viscosity Resistivity @ °F BHT @ °F

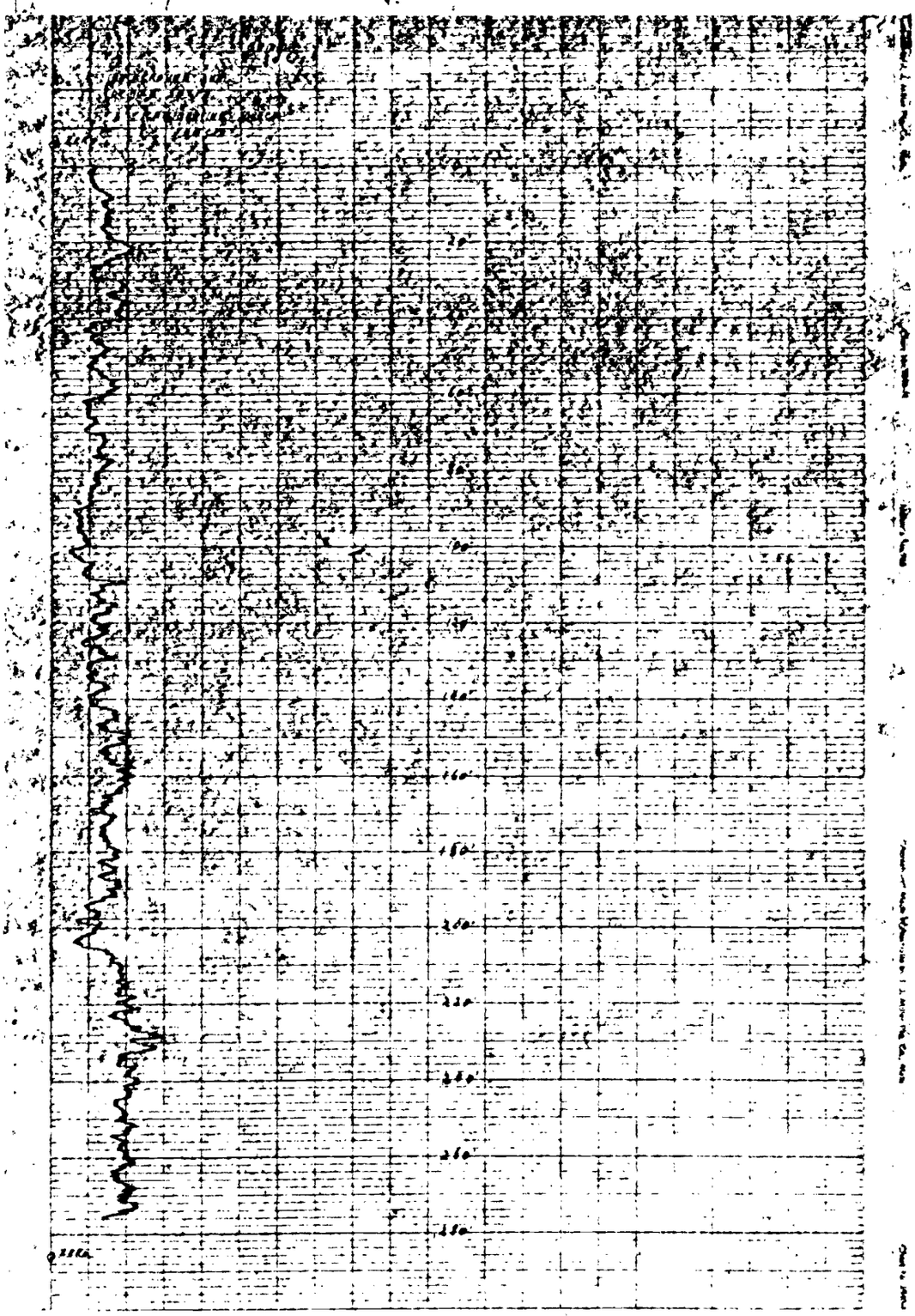
pH Fluid Loss cc/30 min Cake /32" R_{mf} @ °F R_{mc} @ °F

BIT SIZE: " ADDITIONAL CASING feet

OPERATING TIME: 20 min / /

RECORDED BY: B.A.C. BRICE

REMARKS:



00020

SOUTH AUSTRALIAN DEPARTMENT OF MINES
GEOLOGICAL SURVEY

TYPE OF LOG (S): S.P.O Point Resistivity

DATE: 26/7/70 10 mm TIME: 1225 hrs / 1240 hrs

AREA: Spring Field Basin S.A. LOCATION: Lat. Long.

WELL: S.F. No 2

ELEVATION G.L.: K.B.: Log from feet above G.L. DEPTH SCALE:

RUN NUMBER: 2

FIRST READING: 2871 LAST READING: 01

CASING SHOE DEPTH ("):LOG feet DRILL feet TOTAL DEPTH LOG feet DRILL feet

MUD: Type Density Viscosity Resistivity @ °F BHT @ °F

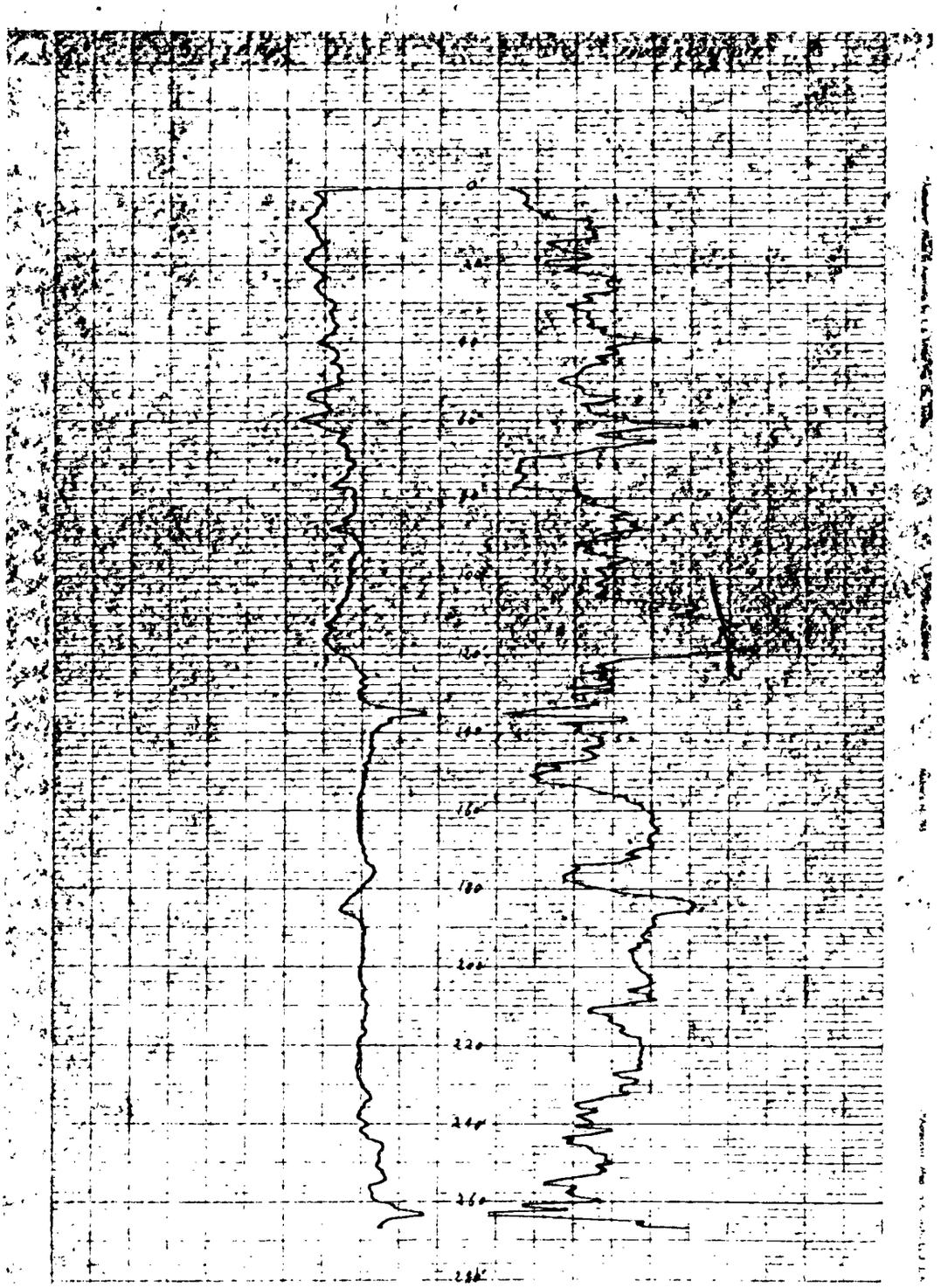
pH Fluid Loss cc/30 min Cake /32nd R_mf °F R_mc @ °F

BIT SIZE " ADDITIONAL CASING feet

OPERATING TIME: 15 min

RECORDED BY: B.A.C. BRICE

REMARKS:



SR 146

00021

TYPE OF LOG(S) GAMMA 50 CPS.

DATE 26/7/70 TIME: 1150 / 1210

AREA: Springfield Basin SA LOCATION: Lat Long

WELL SF No 2

ELEVATION G.L. K.B. Log from feet above G.L. DEPTH SCALE:

RUN NUMBER: / / / /

FIRST READING: 267 / / / LAST READING: 01 / / /

CASING SHOE DEPTH (") LOG feet D. F. feet TOTAL DEPTH LOG feet DR LL feet

MUD Type Density Viscosity Resistivity @ °F BHT @ °F

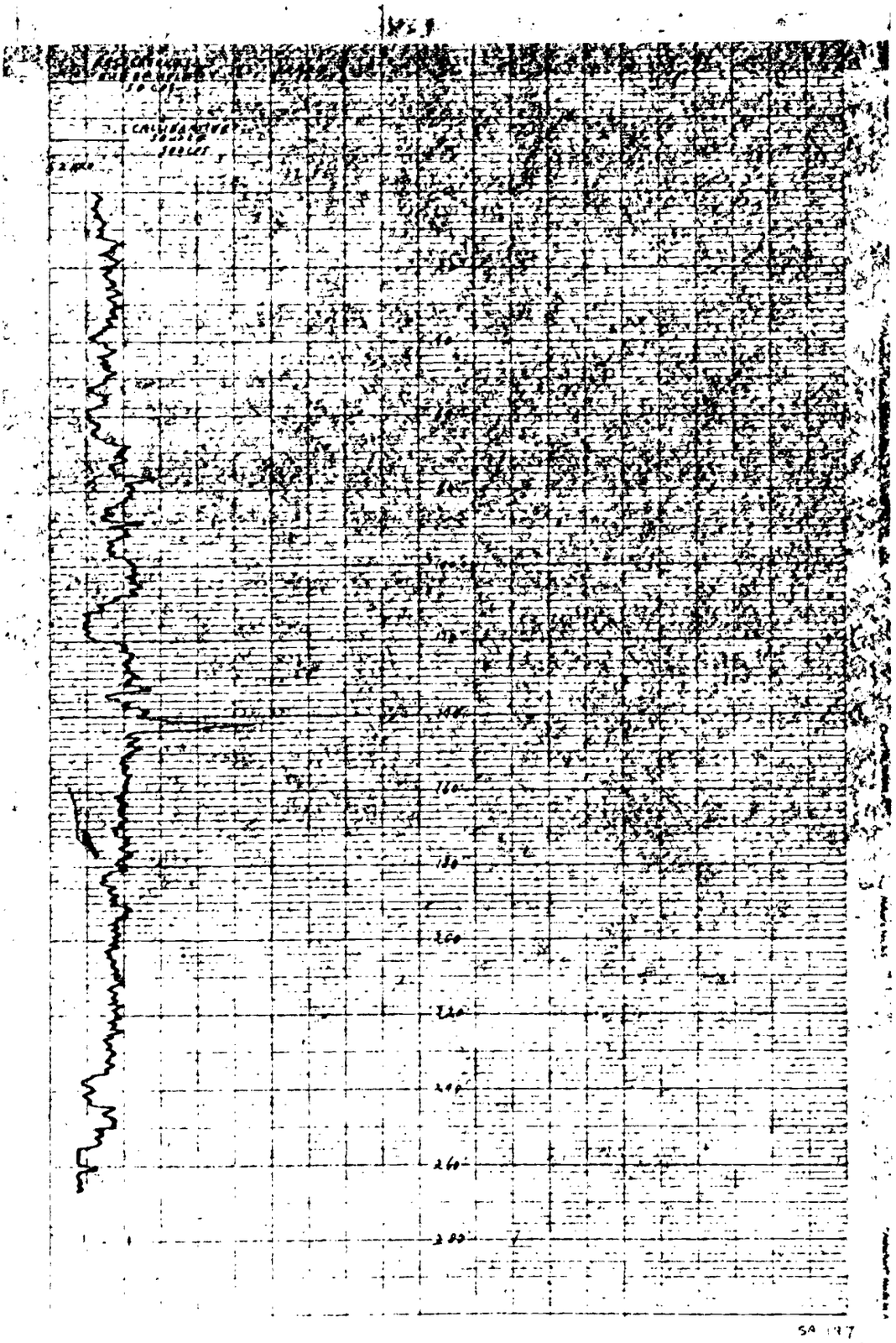
pH Fluid Loss cc/30 min Cake /32" R_{mf} @ °F R_{mc} @ °F

BIT SIZE " ADDITIONAL CASING feet

OPERATING TIME: 20 mins / /

RECORDED BY B A C BRICE

REMARKS



SA 197

1251-1

SOUTH AUSTRALIAN DEPARTMENT OF MINES
GEOLOGICAL SURVEY

TYPE OF LOG (S): S.P. & Point Resistivity
10mv. 5Ω.

DATE: 26/7/70 TIME: 1225 hrs / 1240 hrs /

AREA: Spring Field Basin SA LOCATION: Lat. Long.

WELL: S.F. No. 2.

ELEVATION G.L.: K.B.: Log from feet above G.L. DEPTH SCALE:

RUN NUMBER: 2 / / / /

FIRST READING: 267 / / / / LAST READING: 0 / / / /

CASING SHOE DEPTH ("):LOG feet DRILL feet TOTAL DEPTH:LOG feet DRILL feet

MUD: Type Density Viscosity Resistivity @ °F BHT @ °F

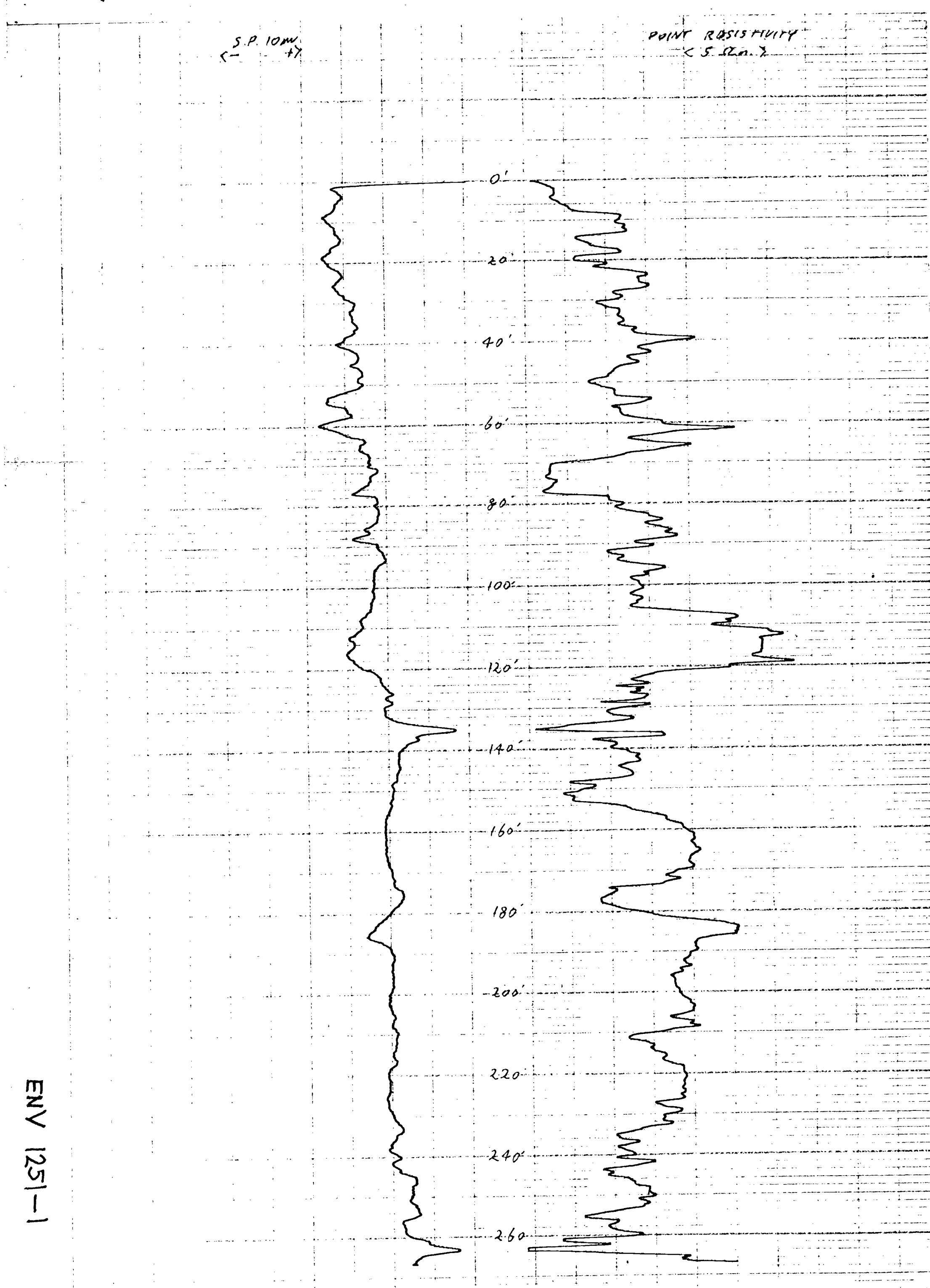
pH Fluid Loss cc/30 min. Cake /32" R_{mf} @ °F R_{mc} @ °F

BIT SIZE: " ADDITIONAL CASING: " @ feet

OPERATING TIME: 15 min / /

RECORDED BY: B.A.C. BRICE

REMARKS:



"Autocharts" Made in Australia by J. J. Miller Pty. Co., Melb.

Chart No. 5910-N

Maker's No. 63

"Autocharts" Made in Australia by J. J. M

ENV 1251-1

1251-2

SOUTH AUSTRALIAN DEPARTMENT OF MINES
GEOLOGICAL SURVEY

TYPE OF LOG (S): GAMMA 50 CPS.

DATE: 26/7/70 TIME: 1150 / 1210

AREA: Springfield Basin SA LOCATION: Lat. Long.

WELL: S.F. No 2.

ELEVATION G.L.: K.B.: Log from feet above G.L. DEPTH SCALE:

RUN NUMBER: 1 / / / /

FIRST READING: 267 / / / / LAST READING: 0 / / / /

CASING SHOE DEPTH ("):LOG feet DRILL feet TOTAL DEPTH:LOG feet DRILL feet

MUD: Type Density Viscosity Resistivity @ °F BHT @ °F

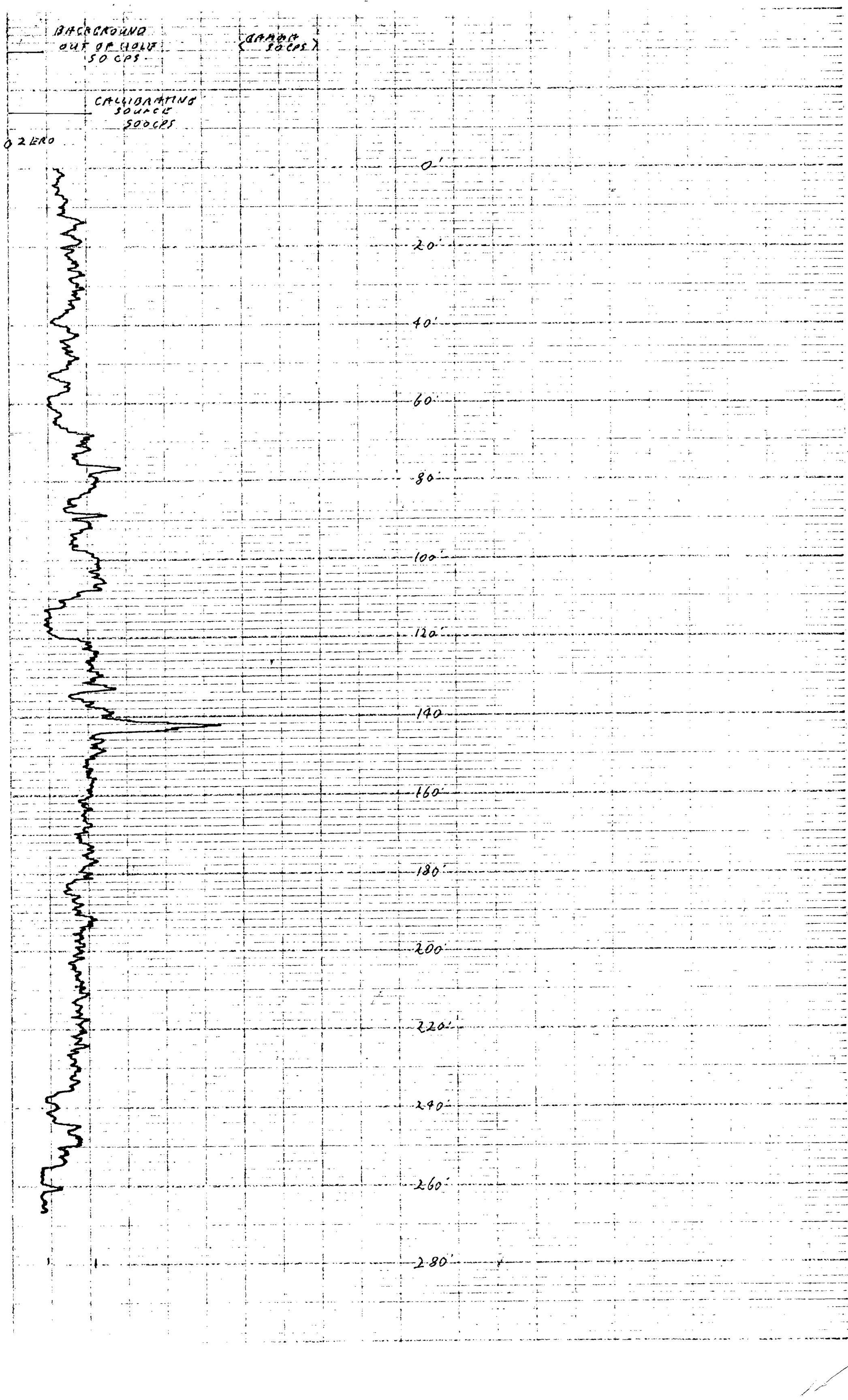
pH Fluid Loss cc/30 min. Cake /32" R_{mf} @ °F R_{mc} @ °F

BIT SIZE: " ADDITIONAL CASING: " set at feet

OPERATING TIME: 20 min. / /

RECORDED BY: B.A.C. BRICE

REMARKS:



ENV 1251-2

1251-3

SOUTH AUSTRALIAN DEPARTMENT OF MINES
GEOLOGICAL SURVEY

TYPE OF LOG (S): S.P. 10mv. Point Resistivity 5 Ω m.

DATE: 23/7/70 TIME: 1700 hrs to 1725 hrs

AREA: Springfield Basin SA LOCATION: Lat. Long.

WELL: S.F. No. 1

ELEVATION G.L.: K.B.: Log from feet above G.L. DEPTH SCALE:

RUN NUMBER: 2 / / / /

FIRST READING: 278' / / / / LAST READING: 0' / / / /

CASING SHOE DEPTH ("): LOG feet DRILL feet TOTAL DEPTH: LOG feet DRILL feet

MUD: Type Density Viscosity Resistivity @ °F BHT @ °F

pH Fluid Loss cc/30 min. Cake /32" R_{mf} @ °F R_{mc} @ °F

BIT SIZE: " ADDITIONAL CASING: " @ feet

OPERATING TIME: 25 min / /

RECORDED BY: B.A.C. BRICE

REMARKS:

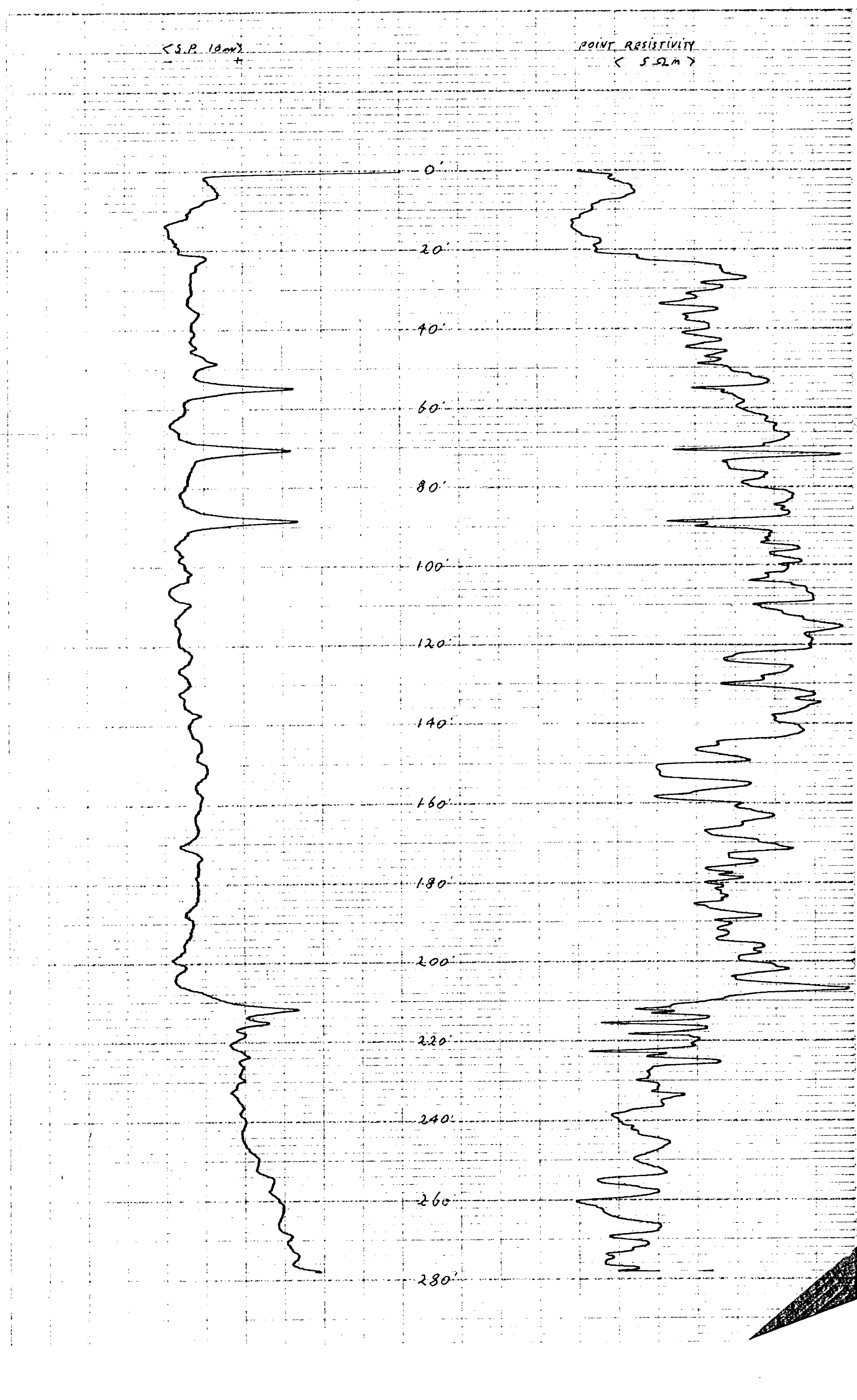


Chart No. 5940-N

Makers No. 765

"Acracha" Made in Australia by J. J. Miller Eng. Co., Melb.

ENV 1251-3

1251-4

SOUTH AUSTRALIAN DEPARTMENT OF MINES
GEOLOGICAL SURVEY

TYPE OF LOG (S): GAMMA 50 C.P.S.

DATE: 23/7/70 TIME: 1635 hrs to 1655 hrs

AREA: Springfield Basin SA. LOCATION: Lat. , Long.

WELL: S.F. No 1

ELEVATION G.L.: K.B.: Log from feet above G.L. DEPTH SCALE:

RUN NUMBER: / / / / /

FIRST READING: 276' / / / / LAST READING: 0' / / / /

CASING SHOE DEPTH ("):LOG feet DRILL feet TOTAL DEPTH:LOG feet DRILL feet

MUD: Type Density Viscosity Resistivity @ °F BHT @ °F

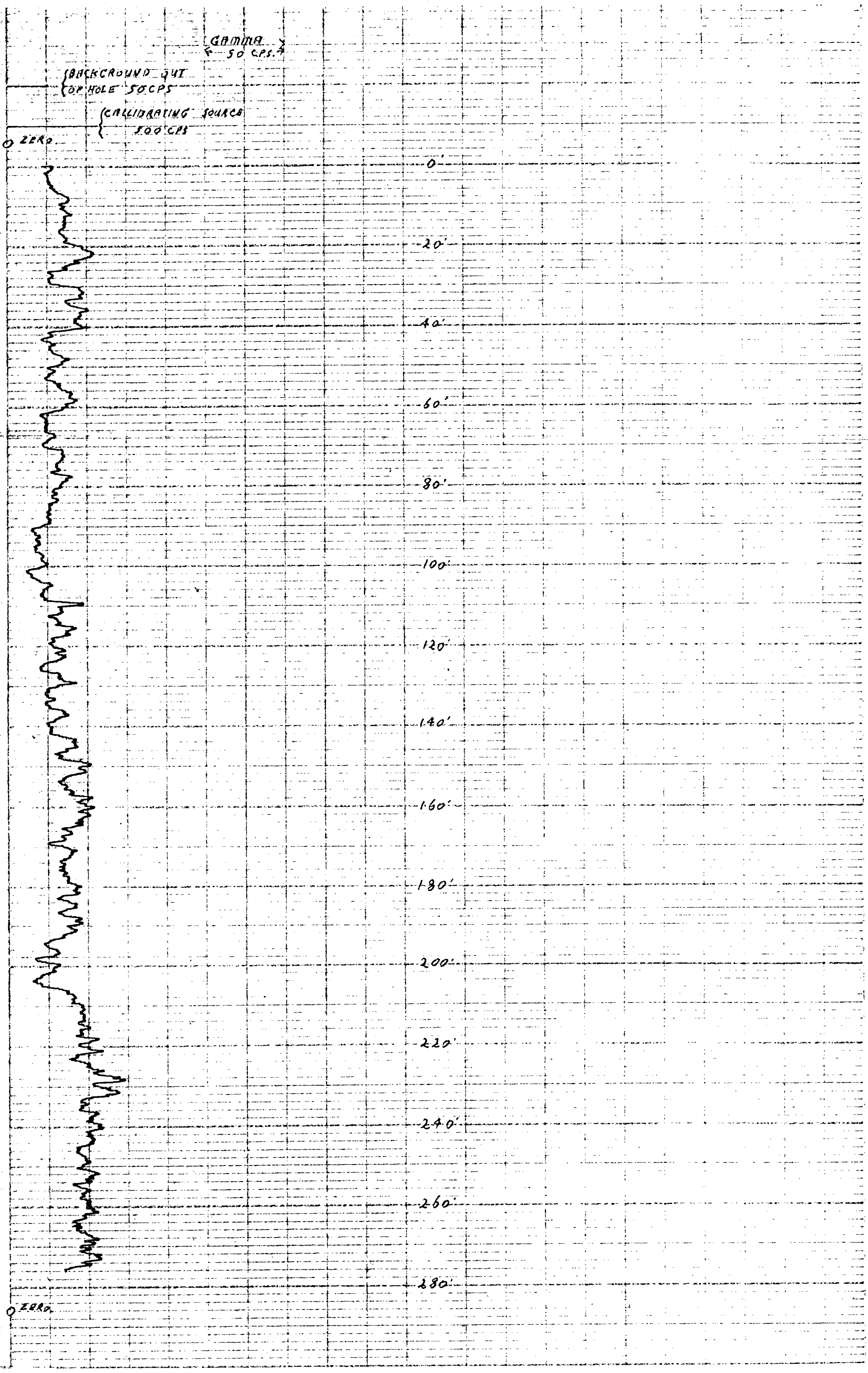
pH Fluid Loss cc/30 min. Cake /32" R_{mf} @ °F R_{mc} @ °F

BIT SIZE: " ADDITIONAL CASING: " set at feet

OPERATING TIME: 20 min / /

RECORDED BY: B.A.C. BRICE

REMARKS:



Australia by J. J. Miller Ptg. Co., Melb.

Chart No. 5940-N

Made in Australia by J. J. Miller Ptg. Co., Melb.

Chart No. 5940-I

ENV. 1251-4