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EL 112

PARACHILNA

PROGRESS AND FINAL REPORTS TO LICENCE SURRENDER FOR THE PERIOD 19/11/1973 TO 18/5/1974

Submitted by Dampier Mining Co. Ltd 1974

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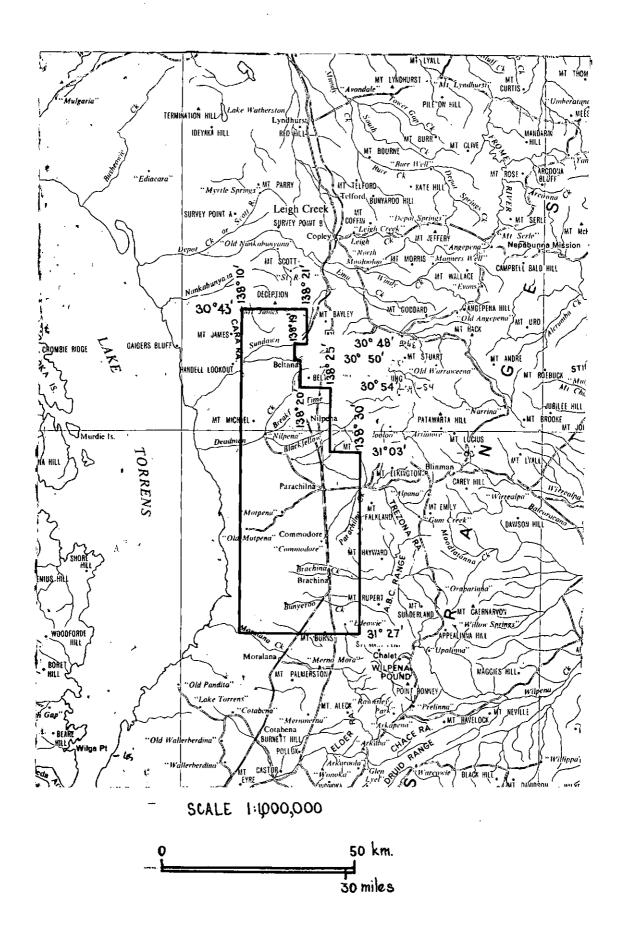
Minerals and Energy Resources

7th Floor

101 Grenfell Street, Adelaide 5000

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





BROKEN HILL PROPRIETARY COMPANY LTD DOCKET, DM 9GG/73 AREA 2141 km2.

1:250000 PLANS COPLEY
PARACHILNA

LOCALITY PARACHILNA

EL No. 112

EXPIRY DATE 18.11.74

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TENEMENT HOLDER: Dampier Mining Co. Ltd.

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EXPLORATION LICENCE 112

PARACHILNA, SOUTH AUSTRALIA.

REPORT FOR THE QUARTER ENDED 31st MARCH, 1974.

1. GENERAL STATEMENT

To examine the potential of the area for sedimentary uranium, a programme of drilling was carried out to invextigate the structure and stratigraphy of the Beltana embayment area.

2. FIELD INVESTIGATIONS

2.1 Drilling

Eight rotary drill holes, P.C.1 - 8 totalling 618.8 metres were drilled. Bore locations are shown on Figure 1 (A2-1158). The drill-holes were logged in the field visually and by scintillometer probe. Samples were selected for chemical analysis and palynological study.

3. RESULTS OF INVESTIGATIONS

3.1 Drilling

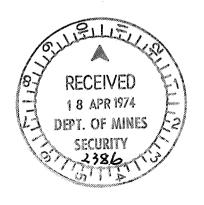
Drill logs, including radiometric logs, are attached. Figure 2 (A4-1557) and Figure 3 (A4-1556) show graphic logs for bores P.C.1 - 5 and 7 and bores P.C. 6,5, and 8 respectively.

4. EXPENDITURE

Expenditure debited to Exploration Licence 112 to 28th February, 1974 was as follows:-

	\$4,772
Sample Analysis	\$ 39
Drilling	\$4,150
Wages and Salaries	\$ 583

Expenditure for March, 1974, has not yet been consolidated.



This report if submitted to the Mines Department as required by Condition 4 of Exploration Licence 112

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	T.	Other minerals	Date:	Iron oxides Removal of		eno c	5			=		GEOL.		1 /	ALTERAT				NERALIZA	TION
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¥	Pyrite/marcasite Other minerals	level in hole Iron oxides		6 cor	- I GFOL	SHEET / OF SHEETS 2. ALTERATION MINERALIZATION
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		Pyrite/marcasite Other minerals	level in hole Date :	Bleaching Iron oxides	e ·	(per					5	HEET 2 OF 2	SHEETS	
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		ROCK-TYPE	WEATHERING	INDROTHERMAL / MAGMATIC ALCERATION	MINERALIZATION .		RADIOMETRIC	LOG	DRILLI SHI	NG HEAI EET NO.	DER 401618	THE BR	OKEN HILL	PROPRIETA DEPARTMENT	RY CO. LT	D.,
		Quartz Pebbles	iron oxides Clay	Distribution:		axis (degrees)		•	1		: 88.6 M.	PROSPECT			E -	
·	(ES)	Clay Organic matter	Motting Base complete ax	Sandstone iens Clay sandstone		ap) s			Core	size	From To	PARACHILMA	LOCATION \$4 54 - 9 6315174	<u> </u>	2 112	
	METRES)	Grain size Feidspars	Base partial ox. Ground water	Carbonate nodules Bleaching		core axis (9:704	11.	J
	Ħ	Pyrite/marcasite Other minerals	level in hole Date:	Iron oxides Removal of		ا ما		•	=		GEOL.	SHEE ALTERATIO	T / OF 2	, SHEETS MINERAL	ZATION	
	рертн		30.11.73	primary minerals					EPT res)	VER	<u> </u>	GRAPHIC LOG	1 Weak 2 Moderate		0./	SAMPLE
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	ROCK-TYPE	WEATHERING	HYDROTHERMAL / MAGMATIC ALTERATION	MINERALIZATION		RADIOMETRIC LOG	DRILLIN SHE	G HEADER 401618	THE BROKEN HILL	. PROPRIETAI	RY CO. LTÚ+
	Quartz	Iron exides	Distribution:		ecs)	,	Ī	EPTH: 88.6.		DEPARTMENT	
ES)	Peobles Clay	Motting Bose complete ox	Sandstone lens		(degrees)		Core si	ze From To	PROSPECT LOCATION PARACHILIYIS SH 54- 631517	TITL	E
METRES)	Organic matter Grain size Feldepars	Base partial ax. Ground water	Clay sandstone boundaries Carbonate nodules		axis				DRILLHOLE N	9: 7C4	
1 ~	Pyrite/marcosite	level in hole	Bleaching Iron oxides		core per n			<u> </u>	SHEET 2 OF	SHEETS	<u> </u>
рертн	Other minerals	Date:	Removal of primary minerals		long sity (Ξ	∠ GEOL. α LOG	ALTERATION	MINERALI	ZATION
L III					أغاءا	·	res)	E E	GRAPHIC LOG 2 Moderate	Analysis	SAMPL
HOL					≯ Wit	COUNTS PER SEC.	HOLE DEPTH (metres)	ROCK TYPE	3 Intense	Ca Za U	Ox/Red NO.
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	1		74 6 1 4.			7					
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	ROCK-TYPE	WEATHERING HYDROTHERIAL / MAGMATIC ALTERATION	MINERALIZATION .	RADIOMETRIC LOG	DRILLING HEADER 401618		PROPRIETARY CO. LTD.
	Quartz Pebbles	Iron oxides Distribution:		[1965]	FINAL DEPTH: 88.6 M.	PROSPECT LOCATION	DEPARTMENT *
RES)	Clay Organic matter	Mottling Sandstone lens Base complete ax Clay sandstone		re)	Core size From To	PARRELILAM 8454-9 6330 1752	FL 112
(METRES)	Grain size Feldepars	Base partial ax. Graund water Level in hale Bleaching	4 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	n a c		DRILLHOLE N	9: 7cs.
Ξ	Pyrite/marcasite Other minerate	Date: 30.11.73 Removal of		(ber		SHEET / OF 2	SHEETS
рертн		1,12.)3 primary minerals		seity (F TOG	ALTERATION 1 Week	MINERALIZATION
HOLE				Intensity	HOLE DEPTH (metres) 60 60 80 RECOVERY 90 % ROCK TYPE PR STRUCTURE	GRAPHIC LOG 2 Moderate 3 Intense	Ox/Red NO.
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INDROTHERMAL / MAGMATI DRILLING HEADER SHEET NO. 401818 ROCK-TYPE RADIOMETRIC LOG WEATHERING MINERALIZATION THE BROKEN HILL PROPRIETARY CO. LTD. ALTERATION EXPLORATION DEPARTMENT oxis (degrees) Quartz Distribution: Iron oxides FINAL DEPTH: Pebbles Clay Isolated beds PROSPECT LOCATION TITLE Core size From To SH 54-9 63301752 Clay Mottling Sandstone lens EL 112 PARACHILMA Clay sandstone Organic matter Base complete ox boundaries DRILLHOLE Nº : Pc5 Grain size Base partial or. Carbonate nodules Feldepars Cround water Bleaching level in hole Pyrite/marcasite SHEETS SHEET 2 OF 2. fron oxides носе рерти 60 70 8.0 % 90 % 90 % ROCK TYPE GO STRUCTURE GOOD Other minerals Date: Removal of primary minerals HOLE DEPTH (metres) ALTERATION MINERALIZATION 1 Weak 2 Moderate 3 Intense With SAMPLE Analysis GRAPHIC LOG Zn U NO. FOR COUNTS PER SEC 20 ANALY. Jan 97 福田川 48.6 chi siliceans day sand tax as aliene 853 as a locus as a berg. la_ shale

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Constraints Open common Statements Open commo	V CO LTD *	THE BROKEN HILL PROPRIETARY CO	0/1/2	DRILLING HEADER 40181	RADIOMETRIC LOG	MINERALIZATION .	HYDROTHERMAL / MAGMATIC ALTERATION	WEATHERING	ROCK-TYPE	<u></u>
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		ROCK-TYPE	WEATHERING	HIDROTHERMAL / MAGMATIC ALTERATION	MINERALIZATION .			RADI	OMET	RIC LOG	DRILLII					THE	В	ROKE					CO. LT	D _*
	(53	Quartz Pebbles Clay	iron oxides Clay Mottling	Distribution: Isolated beds Sandstone lens		(degrees)					FINAL Core :					SPECT		LOC	ATION 54 -	9.22		TITLE	1112	
	(METRES)	Organic matter Grain size Feldspars	Base complete ax Base partial ax. Ground water	Clay sandstone boundaries Carbonate nodules		e oxis	The little									DR	ILL	HOL			7	e 6	•	1 4 / 2
		Pyrite/marcasite	Date: 1.12.73	Bleaching Iron oxides Removal of		ig cer	Cher			•	-			GEOL I				ET 2	OF 2	_				<u></u>
	Е ВЕРТН		1:12 73	primary minerals		With lor					LE DEPTH (metres)	VERV	% %	LOG.	GRA	ALTE			veok cderute	1	MINE	RALIZA		SAME
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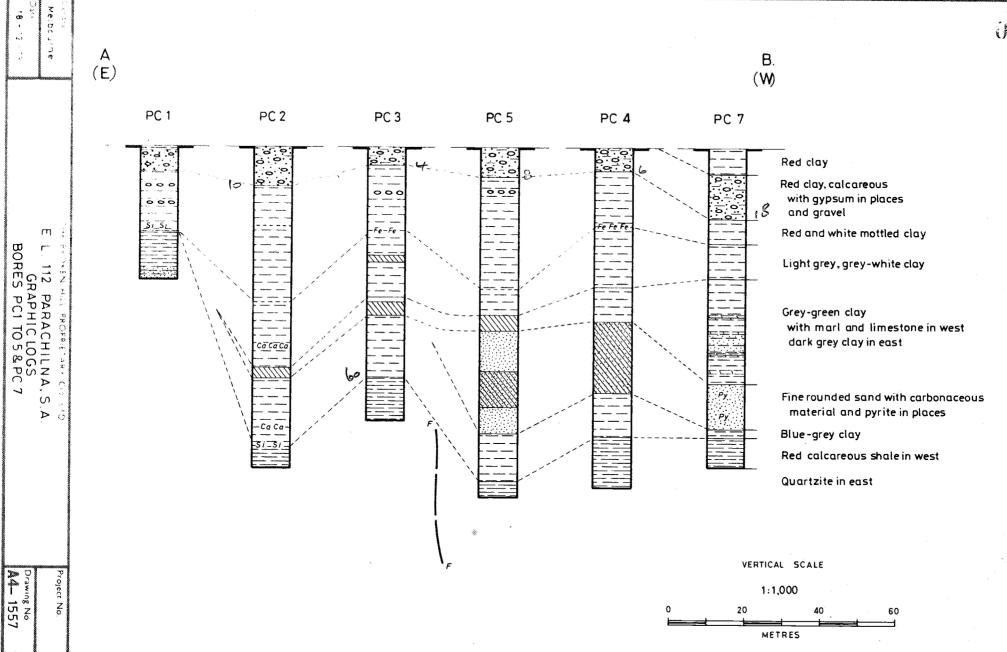
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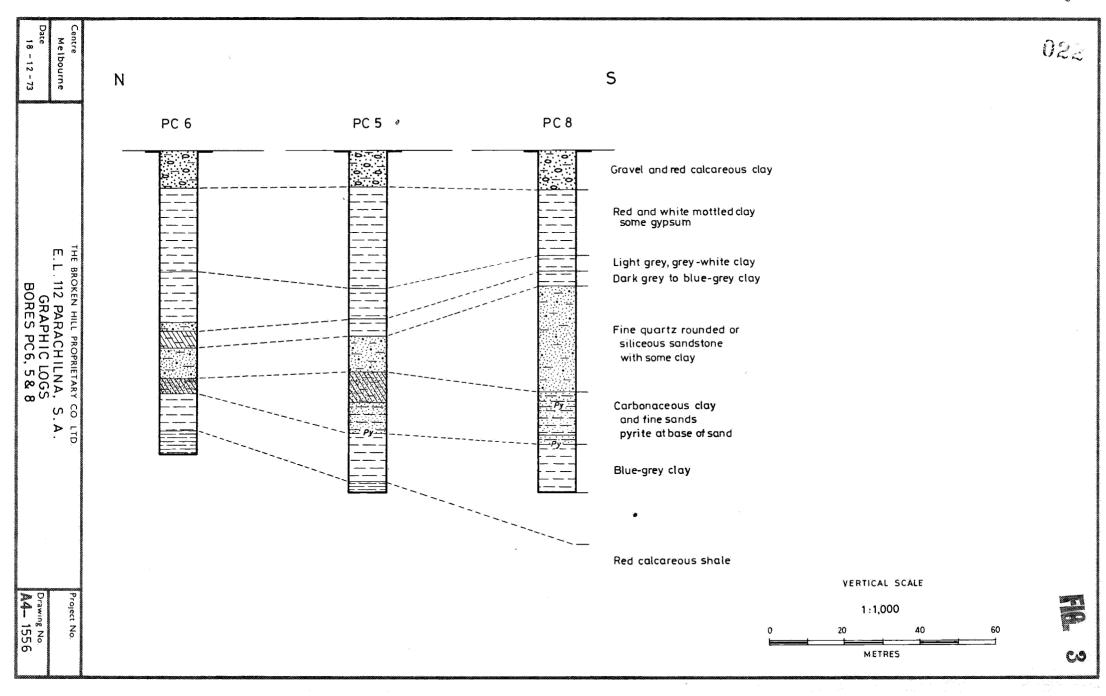
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EXPLORATION LICENCE 112 PARACHILNA, SOUTH AUSTRALIA.

FINAL REPORT.



- 1. General Statement
- 2. Title
- 3. Location and Access
- 4. <u>Previous Work</u>
 - 4.1 Geology
 - 4.2 Structure
 - 4.3 Geological History
- 5. Field Investigations
 - 5.1 Sampling of Water Bores
 - 5.2 Drilling
- 6. Expenditure

Appendices

Appendix 1 Drill, graphic and radiometric logs

Bores P.C. 1 - 8.

Appendix 2 Analytical results.

<u>Figures</u>

Figure 1 Bore location, geology and ground water uranium values.

Figure 2 Graphic logs Bores PC 1 - 5 and 7

Figure 3 Graphic logs Bores PC 6, 5 and 8.

As part of the general research into possible uranium areas in South Australia, the Pirie-Torrens Basin was selected as a possible favourable environment for uranium deposition. Forty-four underground water samples were collected during March, 1973, and from the results and assessment of the geology of the area, the Beltana - Parachilna - Brachina area was chosen for further work. A programme of drilling was carried out to investigate the structure and stratigraphy of the area.

2. Title

Exploration Licence 112 was applied for on 16th August, 1973, and was granted of twelve months on 19th November, 1973. The Licence covers 2,141 square kilometres.

3. Location and Access

Location of Exploration Licence 112 is shown in Figure 1. Access to the area is good. The Licence lies 160 miles north from Port Augusta by sealed and good gravel road. Within the area, station tracks allow access by all vehicles in dry weather. Travel off the tracks is limited to four wheel drive vehicles over much of the area.

4. Previous Work

4.1 Geology

Lake Torrens, a normally dry salina whose surface is 112 ft. above sea level, has been the site of accumulation of some 1100ft. of continental lacustrine sediments since Eocene times. The sediments consist of Eocene carbonaceous mudstone, siltstone and sandstone in the lower part of the section, with overlying dolomitic sediments.

The eastern shore is ill defined, but sand and gypsum bands separate the lake from the Torrens plain which runs to the foot of the Flinders Ranges. These plains have aligned sand dunes superimposed on broad alluvial outwash fans built up by creeks draining the Ranges.

The basin is indicated by a number of stratigraphic bores to contain the following general sequence:

Quarternary - Pleistocene Up to 300 ft.

Tertiary Up to 900 ft.

Cambrian/Precambrian

The Quarternary/Pleistocene consists of lake sediments or wind blown lake derived deposits, with higher level piedmont gravels, sands and varicoloured clays derived from erosion of the Flinders Ranges, which were uplifted and formed a source area during the late Tertiary. Some carbonaceous beds and lignites are present.

The Tertiary (Eocene) consists of fresh and brackish water lacustrine sediments, mudstones, siltstones and sandstones (in part dolomitic). In the lower part carbonaceous sandstones and shales occur with occasional lignite bands.

The development of duricrust occurred in at least two periods during the Tertiary; the first near the base of the Tertiary in Eocene time and again in Oligocene to Miocene. It is doubtful if these can be uniquely distinguished. In this area silcrete duricrust is considered as the base of the Tertiary.

The Tertiary sediments thin and becomes finer to the west indicating an easterly source. Undoubtedly some contribution from the West occurred but this area was a site of Cretaceous sedimentation and no significant uplift in Tertiary time is indicated.

The source area of Tertiary sediments was presumably from the East, but the Flinders Ranges had not been uplifted at the time of deposition. The sediments were therefore probably derived from a mixture of basement gneiss, granite, porphyry, schist terrain, and Adelaidian sediments, possibly in part from reworking of a Cretaceous sheet covering parts of the terrain and perhaps the Flinders area. The Cretaceous-Tertiary of the Flinders Range cover may have been derived in part from the Mt. Painter igneous/uranium bearing complexes but this is very hypothetical.

4.2 Structure

Aeromagnetics indicate a major fault on the west side of Lake Torrens. This appears to be the western limit of the deeper Tertiary extending northward from Port Augusta to just east of Andamooka Island and thence NNW and north.

It is noteworthy that a line of springs appears to occur in the vicinity of the fault south of Andamooka Island, and that a radium-radon rich area occurs near Andamooka Island on a fault within the Precambrian; this may be due to leakage from the Tertiary although the radium could equally well be from a Precambrian source. Aeromagnetics also indicate the Ediacara fault.

Ground magnetic, gravity and seismic work on the eastern shore of Lake Torrens has been carried out by Geosurveys of Australia. for Santos N.L., by the S.A. Mines Department and by Carpentaria Exploration. The gravity and seismic work has indicated several major faults and these are indicated on the attached sketch map (Fig. 1).

The cumulative movement on the Ediacara fault which throws
Tertiary sediments against Adelaidian, is 210 ft down throw
to the west. The basement by magnetics here is at 1800 ft to
2400 ft and east of the fault this basement is at 4700 ft to
5500 ft.

This is considered part of the Torrens hinge zone. The Ediacara fault here is the most important of, probably, a series of lineaments which have been active since (?) Cambrian time. This possibility is illustrated in Fig. 1.

Seismic work by Kendal indicates the presence of a fault west of Motpena with a cumulative down throw to the west of 200 ft., and at Warioota a further indication of faulting with a considerable throw from the profiles viewed at Adelaide with the down throw to the west.

Faulting is indicated east of the Ediacara Range from geology reported by Bink (1972).

The South Australian Mines Department infers faults along the westside of the Flinders Ranges, but these are presumed and said to parallel the lake shore and Flinders Ranges Horst.

Mines Department personnel indicate that the age of faulting in the Flinders Ranges is early Tertiary. Evidence for this is particularly evident in the Adelaide region and on the east side of the Flinders Ranges in the Frome Embayment in which thick sediment wedges have been intersected in drilling.

Binks (1972) suggests a second period of uplift in the late Tertiary or Quarternary. Indeed seismic evidence suggests that the readjustments are continuing.

The Ediacara fault and an associated anticline in the Adelaidian rocks cause a basement ridge which extends from Brachina through Motpena to Ediacara. This bounds a sub-basin in the Parachilna area, which in the Tertiary appears to be partly separated from the Torrens basin proper.

4.3 Geological History

Prior to Mesozoic deposition, the Lake Torrens area was occupied by gently folded Cambrian limestone and Proterozoic sandstone and shale. The Jurassic epeirogenic movements resulted in the formation of the Great Artesian Basin to the north. Lower Cretaceous marine sedimentation apparently did not extend into the Lake Torrens area, but later the Lake Frome embayment extended west across the Flinders Ranges (Callen 1973). The area became dry land again in Cenomanian time and stable weathering conditions prevailed to the end of the Cretaceous. This may be the time of first silcrete formation.

During the Palaeocene, uplift of the Olary and Barrier Ranges to the south and east of the Flinders Ranges occurred, and erosion of their cover led to the deposition of coarse fluviatile carbonaceous sands in the Lake Frome area and probably encroaching onto the area west of the Flinders Range.

The Torrens Basin subsidence began in the early Eocene and fine sands and carbonaceous silts probably of fluvial as well as lacustrine origin were spilled into the Torrens Basin.

Activity along faults near Beltana and Parachilna provided small basins of deposition. The source of this sediment is probably Jurassic and Cretaceous sedimentary cover; or cover and detritus, south from the Olary Ranges, east from the Barrier Ranges and possibly west from the Gawler Ranges.

Further uplift at the end of the Tertiary began to uncover the Flinders Ranges and to redistribute lower Eocene Sediments.

A period of climatic stability existed through the Oligocene to the Miocene and where suitable conditions applied further duricrusts/silcretes were formed. The Quarternary sediments are fanglomerates and playa lake deposits.

5. Field Investigations

5.1 Sampling of Water Bores

Forty-four existing windmill equiped bores in the Pirie Torrens Basin were sampled, and the water analysed for
uranium, radon. Figure 1 shows the pattern of uranium and
radon values obtained. The results suggest that the basin
could be significantly uraniferous.

From the small amount of drill hole data available, the most favourable strata appear to be below 150 metres, the maximum depth for possible open pit mining. However, as faulting along the western boundary of the Flinders Ranges, particularly in the Beltana area, may have preserved favourable strata at depths within 150 metres of the surface, this area was chosen for a more detailed investigation.

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5.2 Drilling

Eight rotary drill holes, PC 1 - 8 totalling 618.8 metres, were drilled. Bore locations are shown on Figure 1. The drill-holes were logged in the field visually and by scintillometer probe. Samples were selected for chemical analysis and palynological study.

Drill logs, including radiometric logs, are given in Appendix 1. Figure 2 and Figure 3 show graphic logs for bores PC 1 - 5 and 7 and bores PC 6, 5 and 8 respectively.

The drilling proved the presence of up to 25 metres of sands, part of which are carbonaceous. Logging indicated that parts of the carbonaceous section, often close to the top, are more radioactive than other lithologies. The top values from analysis are 26 ppm and 68 ppm (0.13 lbs/ton) uranium.

The basement is much shallower than to the south and appears to be deepening to the south.

No reliable information was obtained about source of sediments, but the most probable source of sand and also of water entry is the south, where the only rocks that could be considered as a uranium source are remote from the area.

Although favourable sediments for uranium mineralization at a suitable depth for open cut mining were found, no uranium mineralization was intersected and the EL. 112 was consequently surrendered.

6. Expenditure

Expenditure debited to Exploration Licence 112 during the duration of the Licence was as follows:-

Wages and Salaries	\$ 583
Drilling	4,150
Sample Analysis	39
Mining Tenement Fees, Licences etc.	4,079
	\$8,851

This report is submitted to the Mines Department as required by Condition 4 of Exploration Licence 112.

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(5)	Gliantz Pebblas Cluy	Iron oxides Clay Motting	Distribution : Isolated beds Sandstone lens		With long core axis (degrees)		i i i i i i i i i i i i i i i i i i i		FINAL I			PROSP		LOCA SA 54 6365			TIT	_	
(ME. (RES)	Organic matter Orain size Fe'dspars	Base complete ox Base partial ox, Ground water	Clay sandstone boundaries Carbonate nodules Bleaching		re oxis	Intensity (per metre)		•					RILLI						037
	Pyrite/marcosite Other minerals	level in hole	Tron oxides		19 00	y (pe			T		GEOL. I	A1	SHEE TERATIO	T 2 1	0F 2		ETS IINERAL	17 / 710	N
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E5)	Que#tz Pebbles Clay	lron exides Clay Motting	Distribution: Isolated beds Sandstone lens Clay sandstone		(degrees)	FINAL DEPTH: 88.6 M. Core size From To	PROSPECT LOCATION PARACULNA SH 54-9 6315174	
(METRES)	Organic matter Grain size Feldspars	Base complete ox Base partial ox, Ground water	baundaries Carbonate nodules Bleaching		oxis			1º: 704 17+625
a ≀	Pyrite/marcasite	level ir hale	Iron oxides		000		SHEET / OF 2	
DEPTH	Other minerals	Date:	Removal of primary minerals	4	irty (E ≥ GEOL.	ALTERATION	MINERALIZATION
0		30.11.73			다. Sep	2 S E E	GRAPHIC LOG 2 Moderate	SAMPLE
HOLE		30.11.73	·		COUNTS PER SEC	HOLE DEPTH (metres) (GRAPHIC LOG 2 Moderate 3 Intense	Ox/Red NO. FOR ANALY.
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A-1000-1	Peobles	Clay	Isolated beds	Y	950	FINAL DEPTH: 88.6.	PROSPECT LOCATION TITLE
E 5)	Clay Organic matter	Mottling Base complete ox	Sandstone lens Clay sandstone		(e (e)	Core size From To	PARACHILMA 84 54-9 EL 112 :
(METRE	Grain Size	Base partial ox. Ground water	boundaries Carbonate nodules		With long core axis (degrees) Intensity (per metre)		DRILLHOLE Nº: アc4 りもり
	Pyrite/marcosite	level ir hole	Bleaching Iron oxides	**	L COD		SHEET 2 OF 2 SHEETS
DEPTH	Other minerals	Date:	Removal of primary minerals		long	± ≥ GEOL.	ALTERATION MINERALIZATION .
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(METRE	Cryanic matter Grain size	Base complete ax Base partial ax.	Clay sandstone boundaries Carbonate nodules		metre)		DRILLHOLE N	£1.112. 5
	Feldepars Pyrite/marcosite Other minerals	Ground water level in hole Outer 30, 11, 73	Bleaching Iron axides		Der			SHEETS /74626
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and the	Coulitz Febrica	tron oxides Clay	Distribution:		core axis (degrees)		:1 4		FINAL	DEP	ŤH:	PROS		EXF	LORATION	I DEPARTMENT	* ' '
(ES)	Clay Organic matter	Mottling Base complete ox	Sandstone lens Clay sandstone		3 -				Core	size	From To	PARA	CHILLNA	6	SH 54-9 330175	2 EL11	2
(METRES)	Grain size Feldspars	Base partial ox. Ground water	boundaries Carbonate nodules		e oxis (·	-	DRIL	LHC	DLE N	19: Pc	04
	Pyrite/marcosite	level is hole	Bleaching tron oxides		With long cor								SHE	EET	2 OF 2	. SHEETS	
DEPTH	Other minerals	Date:	Removal of primary minerals		long	20		*	H.	ž	GEOL. LOG.	-	ALTERAT			MINERALI	
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RES)	Quiartz Pebbles Cloy Organic matter	Iron oxides Clay Motting Base complete ox	Distribution; Isolated beds Sandstone lens Clay sandstone		core axis (degrees)	re)			N .	FINAL	DEPTH: 80-6	PROS	PECT	LOCATION \$4 54-9 6330177	TITLE	
TH (METRE	Feldspars Pyrite/marcosite Other minerals	Base partial ox. Ground water level in hale Date: 1.12.73	boundaries Carbonate nodules Bleaching Iron oxides		g core axi	Intensity (per metre)	*			-				IOLE N	9: PC6	74627
HOLE DEPTH		1.12.73,	Removal of primary minerals		With long	Thrensity	calla	TS PER	Sec	ILE DEPTH (metres)	60 80 RECOVERY 90 % ROCK TYPE CS STRUCTURE		HIC LOG	1 Weak 2 Moderate 3 Intense	MINERALIZA	Ox/Red NO
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Constitution that the second s		' ROCK-TYPE		1	MINERALIZATION	=	1	RADIOMETRIC LOG	D	RILLING I SHEET			THE	BROKEN H	ILL PROPRIETA	ARY C	O.LTD.	•
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Cities Salarian Secretarian Lander Salarian Lander Sal	EP.	Other minerals				guo	Į.		E	<u> </u>	≿ GEC	DL.	ALTERA	TION	MINERA	LIZATIO		
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THE BROKEN HILL PROPRIETARY CO. LTD.

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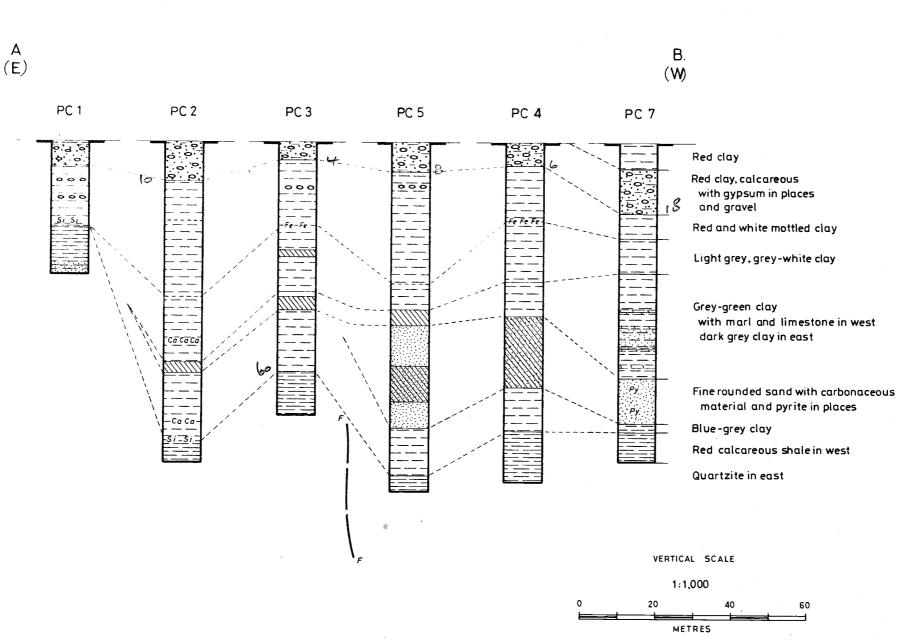
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