

*Alsoy  
Bourette D.  
Ranker  
not Diamond*

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CONTINENTAL OIL COMPANY OF AUSTRALIA LTD.

MINERAL EXPLORATION DIVISION

PROGRESS REPORT No.1

PHOSPHATE SEARCH

AUTHORITIES TO PROSPECT Nos. 1874 and 2081

NORTHERN TERRITORY  
AUSTRALIA

by

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October 1, 1968.

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PART I

AUTHORITY to PROSPECT 1874

(ALROY AREA)

NORTHERN TERRITORY

AUSTRALIA

INTRODUCTION

This report is a summary of the drilling activities carried out on behalf of the Mineral Exploration Division of the Continental Oil Company of Australia Ltd. in Authority to Prospect 1874, Northern Territory, Australia. The tenement covers 1,050 square miles in the Alroy Homestead area, it is approximately 100 miles west of the Queensland border and approximately 200 miles south-west of the Gulf of Carpentaria.

During 1968, a drilling programme within the tenement area discovered a significantly phosphatic interval, after an extensive regional evaluation and literature search. Additional exploratory holes were drilled to further delineate possible extensions of this discovery.

DRILLING

Austral Geo Prospectors Pty. Ltd., Brisbane, Queensland, contracted to air-drill a seven (7) hole exploratory programme in the tenement area. One Mayhew 1000 rotary rig was used, including the necessary equipment, i.e. caravan, water truck, etc.

In all seven (7) holes were drilled for a total footage of 700 feet, one hole was redrilled (Alroy No. 2-2A) due to loss of circulation and caving, and one hole (Alroy No. 3) was lost because of exceptionally hard drilling above the target interval.

The drilling commenced on July 3, 1968 and ended, after a drilling break, on September 20, 1968.

The following table is a summary of the drilling in A. to P. 1874, the Alroy area.

TABLE I

(See Plate I).

<u>Hole</u>	<u>Total Depth</u>	<u>Hole Status</u>
Alroy No. 1	120 feet	Completed
Alroy No. 2	95 feet	Lost Hole
Alroy No. 2A	120 feet	Completed
Alroy No. 3	54 feet	Lost Hole
Alroy No. 4	80 feet	Completed
Alroy No. 5	126 feet	Completed
Alroy No. 6	105 feet	Completed

Total number of holes completed - 5  
Total number of holes lost - 2  
Total footage drilled - 700 feet

## LOGGING & TESTING

Geological logging of the holes drilled was performed by R. Grasso (Minoil Services Ltd., Adelaide) and the writer. R. Shields (Mt. Isa, Queensland) was employed as Field Assistant. The lithologic logging was relatively simple, allowing for only a brief description of the lithologies encountered. If a detailed study becomes necessary, all of the cuttings will be relogged with a binocular microscope. Foot samples were taken and bagged, and will be offered to the Geological Section of the Mines Branch, Northern Territory Administration in due course.

Chip testing using the standard vanadomolybdate solution, was employed as a qualitative test for phosphate. When a positive result was encountered, a complete field Shapiro was run on each foot sample while the hole was being drilled. Those samples testing over 4%  $P_2O_5$ , or otherwise appearing mineralogically interesting, were later sent to Minex, Melbourne and A.M.D.E.L, Adelaide for detailed analysis.

## RESULTS

Lithologic logs of the holes drilled are included in this report in Appendix I, a plan showing well-site locations is also included (Plate I).

Since the number of holes in the tenement are presently limited and widely spaced, it is too early in the exploration programme to assess the local geology in any detail. However, a preliminary assessment of the geological information now at hand is being prepared and will be submitted at a later date.

The discovery area (Alroy No. 2-2A - see Plate I and Appendix I) penetrated a 21 foot phosphatic interval of interbedded siltstone and chert. The phosphate content of this interval averages approximately 10%  $P_2O_5$  with a six (6) foot interval high of 14.5%  $P_2O_5$ . A one (1) foot high of 21.3%  $P_2O_5$  is recorded at a depth of 65 feet. Major discontinuities exist between Alroy No. 2 and Alroy No. 2A, drilled only 50 feet to the south east: (1) A difference of 20 feet in the depth to the top of the major phosphatic zone exists: (2) A comparison of the top interval of the phosphate zone reveals marked difference in  $P_2O_5$  content; and (3) Major lithologic dissimilarities exist. (See lithologic logs - Appendix I).

Alroy No. 1 and No. 4 penetrated predominantly carbonate sections. Alroy No. 1 contained an encouraging interval of oolitic and cherty carbonate. In addition, numerous intervals of what may be erosional zones were encountered. Alroy No. 4 intercepted a silty limestone interbedded with slightly phosphatic and calcareous siltstone and black-brown chert.

Alroy No. 3 encountered a very encouraging section of interbedded siltstone and chert. Two minor phosphatic zones are recorded at approximately 17 feet and 50 feet. The uppermost zone is calcareous, while the second minor zone is non calcareous. This zone was not fully penetrated and was lost at 54 feet, still in a minor phosphatic zone. The hole was lost just above what may be an extension of the major phosphatic zone found in Alroy No. 2-2A. A relatively thick chert bed could not be penetrated after three attempts with new rock bits. A down-hole hammer was not available at the time of drilling.

A small fossil collection was recovered from the immediate well-site area. Palaeontologic evaluations are presently being completed by the Bureau of Mineral Resources in Canberra.

Alroy No. 5 also encountered an encouraging cherty siltstone, but this section only yielded traces of phosphate. A carbonate was encountered near the bottom of the hole. The presence of abundant reddish-brown chert appears to be of some significance. Other lithologic characteristics were however, very favourable.

Alroy No. 6 encountered a major interval of red to brownish-red shaly siltstone. This interval may be of continental origin, and is tentatively correlated with a similar section found in Sylvester No. 1 to the west in A. to P. 2081. (See Part II of this report). Only very minor traces of phosphate are recorded above the red, shaly siltstone.

#### SUMMARY

During the 1969 Field Season, an expanded drilling campaign has been proposed. This will commence Phase II of the phosphate exploration programme in the tenement area. During this phase, the extent of the phosphate deposit will be assessed in regard to available tonnages; metallurgical qualities of the possible ore will be examined, and mining feasibility studies will commence, if merited. The economics of mining, i.e. overburden, transportation, water resources, and possible market application will be of prime importance.



M.D. CAMPBELL

October 1, 1968.

APPENDIX I

Lithologic Logs

Alroy No. 1

Alroy No. 2

Alroy No. 2A

Alroy No. 3

Alroy No. 4

Alroy No. 5

Alroy No. 6

CONTINENTAL OIL COMPANY OF AUSTRALIA LTD.  
MINERAL EXPLORATION DIVISION

**GEOLOGICAL LOG OF DRILL HOLE**

OWNER: Continental Oil Company of Australia Ltd.  
 PROJECT: Authority to Prospect No. 1874 (Alroy)  
 HOLE No.: Alroy No. 1  
 STATE: Northern Territory COUNTY: Australia  
 PARISH: HOLDING: Alexandria  
 LAT.: 18°47'48"S LONG.: 136°33'50"E CO-ORDINATES:  
 INCLINATION: Vertical Approximately 7 miles due north of  
 TOTAL DEPTH: 120 feet Connell's Bore (RN 531)

ROTARY DRILLING: Depth from 0 to 120 feet  
 DIAMOND CORE DRILLING: Depth from to  
 DRILLING: Depth from to  
 GROUND LEVEL: Approx. 780 feet  
 DRILLING CONTRACTOR: Austral Geo Prospectors Ltd., Brisbane  
 SPUDDED: July 3, 1968  
 COMPLETED: July 4, 1968  
 GEOLOGIST: M.D. Campbell

DRILLED DEPTH				BIT		CORE RECOVERED	% CORE RECOVERY	CHIP ANALYSIS	FIELD ANALYSIS	LABORATORY ANALYSIS	GENERALIZED LITHOLOGY	LITHOLOGIC DESCRIPTION AND REMARKS	DATE
From		to		BIT	RATE								
feet	ins.	feet	ins.					feet	ins.				
0		1		RB	F			X			} } Soil	Soil, black, partly calcareous w/small calcite and gypsum crystals, clayey	
		2						X			} +	As above	
		3						X			+ } Soil	As above, becoming dark grey, gypsum crystals to 1/16" prismatic	
		4						X			} }	As above	
		5						X			+ }	As above	
		6						X			} }	As above	
		7						X			+ } Soil	As above	
		8						X			} } Soil	As above, becoming a light khaki colour (?weathered siltstone)	Recent
		9			F			X			~ ~	As above, due to increasing silty material	Tertiary
		10						X			~ ~ ~ ~	Siltstone, light khaki colour, clayey in part, very weathered black and red clay minerals, slightly calcareous, very soft	
		11						X			~ ~ + }	As above, with gypsum crystals (to 1/8")	



DRILLED DEPTH				BIT		CORE RECOVERED		% CORE RECOVERY	CHIP ANALYSIS	FIELD ANALYSIS	LABORATORY ANALYSIS	GENERALIZED LITHOLOGY	LITHOLOGIC DESCRIPTION AND REMARKS	DATE
From		to		BIT	RATE	feet	ins.							
feet	ins.	feet	ins.											
11		12							X			~	As above,	
		13							X			~	As above, becoming more clayey, colour to a light ochre - still heavily weathered	
		14							X			~	As above, still slightly calcareous	
		15							X			~	As above, macro gypsum wanting	
		16							X			~	As above	
		17							X			~	As above	
		18							X			~	As above	
		19							X			~	As above	
		20							X			~	As above	
		21							X			~	As above	
		22							X			~	As above, becoming very clayey	
		23			M				X			} ~	Clay - siltstone, white to off-pink, speckled, with frags. of white medium hard siliceous carbonate, Sample damp, also light grey siltstone, calcareous	
		24							X			~	As above	
		25							X			~	As above	
		26							X			~	As above	
		27			VF				X			~	As above, marl or calcilutite, very calcareous and more silty in places. Chert present, very minor but first appearance, black colour - nodular (rounded frags.)	

DRILLED DEPTH				BIT		CORE RECOVERED		% CORE RECOVERY	CHIP ANALYSIS	FIELD ANALYSIS	LABORATORY ANALYSIS	GENERALIZED LITHOLOGY	LITHOLOGIC DESCRIPTION AND REMARKS	DATE
From		to		BIT	RATE	feet	ins.							
feet	ins.	feet	ins.											
27		28							X				As Above	
		29							X				As above	
		30							X				As above	
		31			M				X				As above	
		32							X				Siltstone, clayey, less calcareous, dark ochre colour in places to light khaki - heavily weathered profiles, with medium hard siliceous or dolomitic carbonate. Chert wanting	Tertiary Middle Cambrian
		33							X				As above	
		34							X				As above	
		35							X				As above	
		36							X				As above	
		37			S				X				Limestone, light pink to light brown, very calcareous and crystalline, oolitic in places, silty in part, Middle Cambrian	
		38							X				As above	
		39							X				As above	
		40							X				As above	
		41			F				X				Siltstone, ochre colour to dark khaki with minor light grey carbonate - heavily weathered, siltstone clayey in part with black mineral inclusions	
		42							X				As above	
		43							X				As above	

DRILLED DEPTH				BIT		CORE RECOVERED		% CORE RECOVERY	CHIP ANALYSIS	FIELD ANALYSIS	LABORATORY ANALYSIS	GENERALIZED LITHOLOGY	LITHOLOGIC DESCRIPTION AND REMARKS	DATE
From		to		BIT	RATE	CORE RECOVERED								
feet	ins.	feet	ins.			feet	ins.							
43		44							X			~ ~	As above	
		45							X			~ ~	As above	
		46							X			~ ~	As above	
		47							X			~ ~	As above	
		48							X			~ ~	As above	
		49							X			~ ~	As above	
		50			S				X			~ ~	Limestone, light grey to off-white, partly silty in places, oolitic in places, very calcareous, chert brown (interbedded) first appearance	
		51							X			~ ~	As above	
		52							X			~ ~	As above	
		53							X			~ ~	As above	
		54							X			~ ~	As above	
		55							X			~ ~	As above	
		56							X			~ ~	As above	
		57							X			~ ~	As above	
		59							X			~ ~	As above	
		60							X		0.15	~ ~	As above	
		61							X		0.05	~ ~	As above	
		62							X		<0.05	~ ~	As above	
		63							X		<0.05	~ ~	As above	

DRILLED DEPTH				BIT		CORE RECOVERED		% CORE RECOVERY	CHIP ANALYSIS	FIELD ANALYSIS	LABORATORY ANALYSIS	GENERALIZED LITHOLOGY	LITHOLOGIC DESCRIPTION AND REMARKS	DATE
From		to		BIT	RATE	feet	ins.							
feet	ins.	feet	ins.											
63		64							X		0.05		As above	
		65							X		0.05		As above, becoming more silty	
		66			VS				X		0.20		Siltstone, khaki colour, slightly siliceous dark brown chert very abundant	
		67			F				X		0.35		Siltstone, ochre colour to light chocolate (?a very weathered zone or profile)	
		68							X		0.30		As above, becoming very calcareous	
		69			M				VST		0.10		Limestone, light brown, very silty and soft in part and partly siliceous. Brown chert with ferruginous coatings, oolitic in part - siliceous overgrowths	
		70							"		0.05		As above	
		71							"		0.10		As above	
		72							"		0.15		As above	
		73							"		0.10		As above	
		74							"		0.40		As above	
		75							"		0.10		As above	
		76							"		0.15		As above	
		77							"		0.15		As above	
		78							"		0.05		As above	
		79			VS				"		0.05		Limestone, light grey to off-white colour, mottled texture & vaguely oolitic, partly siliceous. Chert wanting	

DRILLED DEPTH				BIT		CORE RECOVERED		% CORE RECOVERY	CHIP ANALYSIS	FIELD ANALYSIS	LABORATORY ANALYSIS	GENERALIZED LITHOLOGY	LITHOLOGIC DESCRIPTION AND REMARKS	DATE
From		to		BIT	RATE	feet	ins.							
feet	ins.	feet	ins.											
79		80									0.05		As above	
		81									0.05		As above	
		82									< 0.05		As above	
		83									0.30		As above	
		84									0.05		As above	
		85									< 0.05		As above	
		86			FM						0.10		Siltstone, very calcareous, brown chert abundant, light khaki	
		87									0.10		to dark khaki - weathered profile?	
		88									0.15		As above	
		89			S						0.10		Limestone, as above, still vaguely oolitic in places	
		90									0.05		As above, chert wanting	
		91									0.05		As above	
		92									0.05		As above	
92		109									all $\leq$ 0.20		As above, very uniform	
		110							X				As above	
		111			VS				X				Limestone, med. brown, very siliceous or dolomitic, but other-	
		112							X				wise as above limestone. Chert wanting	
		113							X				As above	
		114							X				As above	

DRILLED DEPTH				BIT		CORE RECOVERED		% CORE RECOVERY	CHIP ANALYSIS	FIELD ANALYSIS	LABORATORY ANALYSIS	GENERALIZED LITHOLOGY	LITHOLOGIC DESCRIPTION AND REMARKS	DATE
From		to		BIT	RATE	feet	ins.							
feet	ins.	feet	ins.											
114		115							X			As above		
		116							X			As above		
		117							X			As above		
		118							X			As above		
		119							X			As above		
		120	T.D.						X			As above		

CONTINENTAL OIL COMPANY OF AUSTRALIA LTD.

MINERAL EXPLORATION DIVISION

GEOLOGICAL LOG OF DRILL HOLE

OWNER: Continental Oil Company of Australia Ltd.  
 PROJECT: Authority to Prospect No. 1874 (Alroy)  
 HOLE No.: Alroy No. 2  
 STATE: Northern Territory COUNTY: Australia  
 PARISH: HOLDING:  
 LAT.: 19° 09' 48" S. LONG.: 136° 26' 15" E. CO-ORDINATES:  
 INCLINATION: Vertical At Playford River  
 TOTAL DEPTH: 95 feet On Alroy - Alexandria Boundary

ROTARY DRILLING: Depth from 0 to 95 feet  
 DIAMOND CORE DRILLING: Depth from to  
 DRILLING: Depth from to  
 GROUND LEVEL: approx. 790 feet  
 DRILLING CONTRACTOR: Austral Geo Prospectors  
 SPUDDED: July 4, 1968  
 COMPLETED: July 4, 1968  
 GEOLOGIST: M.D. Campbell

DRILLED DEPTH				BIT		CORE RECOVERED	% CORE RECOVERY	CHIP ANALYSIS	FIELD ANALYSIS	LABORATORY ANALYSIS	GENERALIZED LITHOLOGY	LITHOLOGIC DESCRIPTION AND REMARKS	DATE
From		to		BIT	RATE								
feet	ins.	feet	ins.			feet	ins.						
0		1		RB	F			X			{ }	Soil - loam, dark grey to dark brown, clayey, slightly calcareous, Pedocalcic soil	July 4, '68
		2						X			{ }	As above	
		3						X			Soil { }	As above	
		4						X			{ }	As above	
		5						X			{ }	As above	
		6						X			{ }	As above, becoming very clayey	
		7						X			{ }	As above	
		8						X			{ }	As above	
		9						X			Soil { }	As above	
		10						X			{ }	As above	
		11						X			{ }	As above, sample very damp	
		12						X			Soil { }	As above, with very minor rounded chert frags. (Reddish-brown)	

DRILLED DEPTH				BIT		CORE RECOVERED		% CORE RECOVERY	CHIP ANALYSIS	FIELD ANALYSIS	LABORATORY ANALYSIS	GENERALIZED LITHOLOGY	LITHOLOGIC DESCRIPTION AND REMARKS	DATE
From		to		BIT	RATE	feet	ins.		Qual.	Semi Quan.	Quan.			
feet	ins.	feet	ins.											
28		29							X			As above		
		30							X			As above		
		31							X			As above		
		32							X			As above, very uniform		
		33							X			As above		
		34							X			As above		
		35							X			As above		
		36							X			As above		
		37			VF				VST			Siltstone, very calcareous, probably, off-white colour, a calclutite, soft, chert very minor but present - (?inter- bedded), light grey and dark brown chert (-Rd-bn chert wanting-) very slightly phosphatic - first indication	(?) Tertiary (?) Middle Cambrian	
		38							"			As above		
		39							"			As above		
		40							"			As above		
		41							"			As above		
		42							"			As above		
		43							"			As above		
		44							"			As above		
		45							"			As above		
		46							"			As above, very uniform		



DRILLED DEPTH				BIT		CORE RECOVERED		% CORE RECOVERY	CHIP ANALYSIS	FIELD ANALYSIS	LABORATORY ANALYSIS	GENERALIZED LITHOLOGY	LITHOLOGIC DESCRIPTION AND REMARKS	DATE
From		to		BIT	RATE	feet	ins.		Qual.	Semi Quan.	Quan.			
feet	ins.	feet	ins.											
46		47							"			— Δ	As above	
		48							"			— I	As above, with increasing brown chert, still very minor -	
									"			— Δ	still very slightly phosphatic	
		49							"			— J	As above	
		50							"			— I	As above	
		51							"			— J Δ	As above	
		52							"			— I	As above	
		53							"			— Δ J	As above	
		54							"			— Δ	As above	
		55							"			— I	As above, becoming a more siliceous.	
		56							"			— Δ J	As above, siltstone grading to a silty limestone	
		57							"			— J Δ	As above	
		58							"			— I Δ	As above	
		59							"			— I Δ	As above	
		60			M				"			— I Δ	Limestone, finely crystalline, partly siliceous, but also	
									"			— I Δ	partly soft - (interbedded cherty limestone and marl?)	
		61							"			— I Δ	As above, but with increase chert to common - first appearance	
									"			— I	of black-brown chert (?interbedded)	
		62							"			— Δ I	As above, becoming a silty limestone with interbedded chert	
		63							"			— I Δ	As above, fairly soft	
		64							"			— I	As above	

DRILLED DEPTH				BIT		CORE RECOVERED		% CORE RECOVERY	CHIP ANALYSIS	FIELD ANALYSIS	LABORATORY ANALYSIS	GENERALIZED LITHOLOGY	LITHOLOGIC DESCRIPTION AND REMARKS	DATE
From		to		BIT	RATE	feet	ins.		Qual.	Semi Quan.	Quan.			
feet	ins.	feet	ins.											
64		65							"				As above	
		66							"				As above	
		67							"				As above	
		68							"				As above	
		69							"				As above	
		70							ST	< 1	0.6		As above	
		71							"	≤ 1	0.8		As above	
		72							"	≤ 1	1.0		As above	
		73							"	≤ 1	1.0		As above	
		74			M				"	≤ 1	0.9		Siltstone or silty shale, siliceous in part, light khaki colour chert increase to abundant - abrupt change from limestone to only very slightly calcareous siltstone - thinly bedded observed - chert (brown-black variety)	
		75							P	9	9.8		As above, but very phosphatic, black chert with reddish stain very minor	
		76								≤ 1	1.5		As above	
		77								≤ 1	-		As above, lost circulation and sample doubtful	
		78								≤ 1	1.0		As above	
		79								≤ 1	0.5		As above	
		80								≤ 1	0.9		As above	
		81								≤ 1	0.9		As above	

DRILLED DEPTH				BIT		CORE RECOVERED		% CORE RECOVERY	CHIP ANALYSIS	FIELD ANALYSIS	LABORATORY ANALYSIS	GENERALIZED LITHOLOGY	LITHOLOGIC DESCRIPTION AND REMARKS	DATE
From		to		BIT	RATE	feet	ins.		Qual.	Semi Quan.	Quan.			
feet	ins.	feet	ins.											
81		82								1	1.3	~ Δ	As above, very uniform lithology	
		83								5	3.9	Δ ~	As above	
		84								5	6.9	~ Δ	As above	
		85								5	4.9	Δ ~	As above	
		86								5	5.5	~ Δ	As above	
		87								5	7.3	Δ ~	As above	
		88								5	6.8	~ Δ	As above	
		89								8	6.3	Δ ~	As above	
		90								12	12.0	~ Δ	As above, becoming very slightly calcareous	
		91								10	11.4	Δ ~	As above, not calcareous, but becoming a darker khaki	
		92								13	8.0	~ Δ	As above	
		93								10	11.2	Δ ~	As above, becoming very sandy w/very minor quartz grains	
		94		RB						12	14.5	~ Δ	As above, caving badly, sandy material very phosphatic	
		95	T.D. Lost Hole			Caving				8	4.5	~ Δ	As above, with increased chert (brown) Last sample of doubtful origin	

CONTINENTAL OIL COMPANY OF AUSTRALIA LTD.

MINERAL EXPLORATION DIVISION

GEOLOGICAL LOG OF DRILL HOLE

OWNER: CONTINENTAL OIL COMPANY OF AUSTRALIA LTD.  
 PROJECT: PLAYFORD BASIN PHOSPHATE  
 HOLE No.: ALROY No. 2A  
 STATE: NORTHERN TERRITORY COUNTY:  
 PARISH: HOLDING: 1874  
 LAT.: LONG.:  
 INCLINATION: Vertical CO-ORDINATES:  
 TOTAL DEPTH: 120 feet Approx. 50' South East of Alroy No. 2

ROTARY DRILLING: Depth from 0 to 120  
 DIAMOND CORE DRILLING: Depth from to  
 DRILLING: Depth from to  
 GROUND LEVEL:  
 DRILLING CONTRACTOR: Austral Geo Prospectors Ltd., Brisbane, Qld.  
 SPUDDED: September 19, 1968  
 COMPLETED: September 19, 1968  
 GEOLOGIST: M.D. Campbell

DRILLED DEPTH				BIT		CORE RECOVERED		% CORE RECOVERY	CHIP ANALYSIS	FIELD ANALYSIS	LABORATORY ANALYSIS	GENERALIZED LITHOLOGY	LITHOLOGIC DESCRIPTION AND REMARKS	DATE
From		to		BIT	RATE	feet	ins.							
feet	ins.	feet	ins.											
0		50							X				See previous log Alroy No. 2 (Date July 4, 1968)	
		51								4			SILTSTONE, calcareous - no chert. Siliceous in part -	
													slightly phosphatic. Light grey colours	
		52								2			As above	
		53								1			As above	
		54								1			As above	
		55								1			As above	
		56								1			As above	
		57								1			As above, with black chert and decreasing calcareous material.	
		59								4	1.4		As above	
		60								9	-		As above, only slight calc.	
		61								11	11.4		SILTSTONE, colour change to medium brown, with brown chert medium soft - chert coated with highly phosphatic material.	

HOLE No.: ALROY No. 2A

GEOLOGIST M.D. Campbell

Page 2

DRILLED DEPTH				BIT		CORE RECOVERED		% CORE RECOVERY	CHIP ANALYSIS	FIELD ANALYSIS	LABORATORY ANALYSIS	GENERALIZED LITHOLOGY	LITHOLOGIC DESCRIPTION AND REMARKS	DATE
From		to		BIT	RATE	feet	ins.							
feet	ins.	feet	ins.											
61		62								13	15.6	~ Δ	As above	
		63								15	12.0	Δ ~	As above	
		64								16	14.7	~ Δ	SILTSTONE, light grey, with less chert.	
		65								16	12.3	Δ ~	As above	
		66								14	21.3		As above	
		67								9	7.3	~ Δ	As above	
		68								10	9.4	Δ ~	As above, with increasing chert and fragments of hard dolomitic (?)	
		69								9.8		~ Δ	limestone.	
		70								4	5.5	~ Δ	As above	
		71								4	4.4	~ Δ	As above, becoming very gritty sample (dolomitic very silty	
												~ Δ	carbonate or very siliceous siltstone - abundant. Black brown chert.	
		72								5	4.5	Δ ~	As above	
		73								6	6.2	~ Δ	As above	
		74								4	4.9	Δ ~	As above	
		75								5	4.7	~ Δ	As above, becoming softer (less gritty material)	
		76								8	10.1	~	As above	
		77								10	8.1	~ Δ	As above	
		78								9	9.7	Δ ~	As above	
		79								10	10.3	~ Δ	As above	
		80								8	8.4	Δ ~	As above	

DRILLED DEPTH				BIT		CORE RECOVERED	% CORE RECOVERY	CHIP ANALYSIS	FIELD ANALYSIS	LABORATORY ANALYSIS	GENERALIZED LITHOLOGY	LITHOLOGIC DESCRIPTION AND REMARKS	DATE
From		to		BIT	RATE								
feet	ins.	feet	ins.					feet	ins.				
80		81							3	-	~ Δ	SILTSTONE, medium brown colour, abundant black chert and minor white siltstone.	
		82							2	2.9	~ Δ	As above	
		83							2		Δ ~	As above	
		84							2	2.4	~ Δ	As above	
		85							2		~ Δ	As above	
		86							3	2.2	~ Δ	As above	
		87							2		Δ ~	As above	
		88							2	2.1	~ Δ	As above, becoming light brown in colour	
		89							3		Δ ~	As above	
		90							3	4.3	~ Δ	As above	
		91							3	4.3	~ Δ	As above	
		92							5	6.0	~ Δ	As above	
		93							5	6.7	~ Δ	As above	
		94							3	3.3	Δ ~	As above	
		95							2		~ Δ	As above	
		96							2	2.0	~ Δ	As above, becoming darker again, stil phosphatic.	
		97							2		~ Δ	As above	
		98							2	2.1	~ Δ	As above	
		99							4		~ Δ	As above	

DRILLED DEPTH				BIT		CORE RECOVERED		% CORE RECOVERY	CHIP ANALYSIS	FIELD ANALYSIS	LABORATORY ANALYSIS	GENERALIZED LITHOLOGY	LITHOLOGIC DESCRIPTION AND REMARKS	DATE
From		to		BIT	RATE	feet	ins.							
feet	ins.	feet	ins.											
99		100								6	3.1	~ Δ	As above, caving badly	
		101								Missed		~	As above	
		102								Missed			As above	
		103								Missed		~ Δ	As above	
		104								2		~	As above	
		105								3			As above	
		106								3		~ Δ	As above	
		107								2		~	As above	
		108								2		Δ	As above	
		109								2		~	As above	
		110								2	1.7	~	As above	
		111								3		~ Δ	As above	
		112								3		~	As above	
		113								2		Δ	As above	
		114								2		~	As above	
		115								2		~	As above	
		116								2		Δ	As above	
		117								2		~	As above	
		118								Missed		~ Δ	Lost circulation	
		119								Missed		Δ ~	Lost circulation	





CONTINENTAL OIL COMPANY OF AUSTRALIA LTD.

MINERAL EXPLORATION DIVISION

GEOLOGICAL LOG OF DRILL HOLE

OWNER: CONTINENTAL OIL COMPANY OF AUSTRALIA LTD.  
 PROJECT: PLAYFORD BASIN PHOSPHATE  
 HOLE No.: ALROY No. 3  
 STATE: NORTHERN TERRITORY COUNTY:  
 PARISH: HOLDING: 1874  
 LAT.: LONG.:  
 INCLINATION: Vertical CO-ORDINATES: Approx. 6 miles West South-west along  
 TOTAL DEPTH: 54 feet Alroy Alexandria Road

ROTARY DRILLING: Depth from ..... to .....  
 DIAMOND CORE DRILLING: Depth from ..... to .....  
 ..... DRILLING: Depth from ..... to .....  
 GROUND LEVEL: Approx. 760'  
 DRILLING CONTRACTOR: Austral Geo Prospectors Ltd., Brisbane, Qld.  
 SPUDDED: September 19, 1968  
 COMPLETED: September 19, 1968  
 GEOLOGIST: M.D. Campbell

DRILLED DEPTH				BIT		CORE RECOVERED	% CORE RECOVERY	CHIP ANALYSIS	FIELD ANALYSIS	LABORATORY ANALYSIS	GENERALIZED LITHOLOGY	LITHOLOGIC DESCRIPTION AND REMARKS	DATE
From		to		BIT	RATE								
feet	ins.	feet	ins.					feet	ins.				
0		1						X			Soil	SOIL, medium brown, clayey, with minor small gypsum crystals	
		2						X			+	As above	
		3						X			} Soil	As above	
		4						X			} }	As above	
		5						X			Soil	As above	
		6						X			+ }	As above	
		7						X			Soil	As above	
		8						X			} }	As above	
		9						X			~ Δ	SILTSTONE, light grey to medium brown, mottled. Very calcareous,	
											Δ ~	chert (brown - light), not usual brown chert (inter-bedded?)	
											~ I	Soft on top becoming harder towards bottom	
		10							1		~ Δ	As above	
		11							1		~ Δ	As above	

DRILLED DEPTH				BIT		CORE RECOVERED	% CORE RECOVERY	CHIP ANALYSIS	FIELD ANALYSIS	LABORATORY ANALYSIS	GENERALIZED LITHOLOGY	LITHOLOGIC DESCRIPTION AND REMARKS	DATE
From		to		BIT	RATE								
feet	ins.	feet	ins.					feet	ins.				
11		12							1		~ Δ	As above	
		13							1		Δ ~	As above	
		14							1		~ Δ	As above	
		15							1		Δ ~	As above	
		16							1		~ Δ	As above	
		17							2	2.0	~ Δ	SILTSTONE, medium brown colour, otherwise as above calc.	
		18							14	5.9	~ Δ	As above	
		19							1		~ Δ	As above	
		20							5	4.7	~ Δ	As above	
		21							1		~ Δ	SILTSTONE, calc. as above (light grey to white) - soft.	
		22							1		Δ ~	As above	
		23							1		~ Δ	As above	
		24							1		~ Δ	As above	
		25							1		~ Δ	As above	
		26							1		~ Δ	As above	
		27							1		~ Δ	SILTSTONE, light grey to white, dark red chert - medium soft to slightly siliceous.	
		28							1		~ Δ	As above	
		29							1		~ Δ	As above	
		30							1		~ Δ	As above	
		31							1		~ Δ	As above	

DRILLED DEPTH				BIT		CORE RECOVERED		% CORE RECOVERY	CHIP ANALYSIS	FIELD ANALYSIS	LABORATORY ANALYSIS	GENERALIZED LITHOLOGY	LITHOLOGIC DESCRIPTION AND REMARKS	DATE
From		to		BIT	RATE	feet		ins.						
feet	ins.	feet	ins.			feet	ins.							
31		32								1		~ Δ	As above	
		33								1		~	As above	
		34								1		Δ	As above	
		35								1		~ Δ	As above	
		36								1		Δ ~	As above	
		37								1		~ Δ	As above	
		38								1		~	As above	
		39								1		Δ	As above	
		40								1		~ Δ	As above	
		41								1		Δ ~	As above	
		42								1		~ Δ	As above	
		43								1		Δ ~	As above	
		44								1		~ Δ	As above	
		45								2		~ Δ	As above	
		46								2	3.7	Δ ~	As above	
		47								3	4.3	~ Δ	SILTSTONE, light grey to off white, dark red brown chert, non calcareous to very slightly calcareous.	
		48								2	5.2	~ Δ	As above	
		49								3	4.6	Δ ~	As above	
		50								5	6.4	~ Δ	As above	
		51								4	6.0	~ Δ	As above	



CONTINENTAL OIL COMPANY OF AUSTRALIA LTD.  
MINERAL EXPLORATION DIVISION

**GEOLOGICAL LOG OF DRILL HOLE**

OWNER: CONTINENTAL OIL COMPANY OF AUSTRALIA LTD.  
 PROJECT: PLAYFORD BASIN PHOSPHATE  
 HOLE No.: ALROY No. 4  
 STATE: NORTHERN TERRITORY COUNTY:  
 PARISH: HOLDING: 1874  
 LAT.: LONG.: CO-ORDINATES:  
 INCLINATION: Vertical 4 miles due south of Alroy 2-2A  
 TOTAL DEPTH: 80 feet along Alroy - Alexandria Border fence.

ROTARY DRILLING: Depth from 0 to 80  
 DIAMOND CORE DRILLING: Depth from to  
 DRILLING: Depth from to  
 GROUND LEVEL: Approx. 765'  
 DRILLING CONTRACTOR: Austral Geo Prospectors Ltd., Brisbane, Qld.  
 SPUDED: September 18, 1968.  
 COMPLETED: September 18, 1968.  
 GEOLOGIST: M.D. Campbell

DRILLED DEPTH				BIT		CORE RECOVERED feet ins.	% CORE RECOVERY	CHIP ANALYSIS	FIELD ANALYSIS	LABORATORY ANALYSIS	GENERALIZED LITHOLOGY	LITHOLOGIC DESCRIPTION AND REMARKS	DATE
From		to		BIT	RATE								
feet	ins.	feet	ins.										
0		8						X			} Soil } +	SOIL, dark to medium brown, clayey, with minor gypsum	
											Soil } +	crystal	
8		13						X			+ Soil }	SOIL, medium grey with increasing gypsum crystal up to	
											Soil ~	1/16" width	
13		14						X			Soil ~	SOIL, with very minor fragments of carbonate material (very	
											Soil ~	silty) a calc. siltstone (?), white colour, slightly	
											} Soil }	phosphatic	
14		15						X			~	As above	
15		16						X			Soil ~	As above, with increasing white calc. material (but still	
											} Soil }	mostly a clayey, med. grey to olive soil.	
16		17							1		~	LIMESTONE, with interbedded siltstone and brown and black	
											~ Δ	chert. Limestone white, very silty. Siltstone weathered	
											Δ ~	Lt. grey to dark brown (mottled), soft brown chert predominates	

DRILLED DEPTH				BIT		CORE RECOVERED		% CORE RECOVERY	CHIP ANALYSIS	FIELD ANALYSIS	LABORATORY ANALYSIS	GENERALIZED LITHOLOGY	LITHOLOGIC DESCRIPTION AND REMARKS	DATE
From		to		BIT	RATE	feet	ins.							
feet	ins.	feet	ins.											
													over black chert - slightly phosphatic	
17		18								1			SILTSTONE, as above, but with minor limestone	
18		19								1			As above, may be zone of advanced weathering (?)	
19		20								2			As above, with increasing carbonate, with major increase in brown chert - still slightly phosphatic	
20		21								1			As above with grey siltstone equal to brown siltstone (brown siltstone slightly siliceous - grey siltstone, soft; black chert chert appears to be nodular - brown chert interbedded	
21		22								1			As above, still calcareous	
22		23								2.5			As above	
23		24								2			As above, with major increase in brown chert	
24		25								2			As above	
25		26								1			SILTSTONE, medium brown, with brown chert and interbedded light grey to white limestone, all calcareous, slightly less phosphatic, major decrease in chert	
26		27								1			As above	
27		28								1			As above	
28		29								1			As above	
29		30								1			As above	
30		31								1			As above, chert almost wanting.	
31		32								1			As above	

DRILLED DEPTH				BIT		CORE RECOVERED		% CORE RECOVERY	CHIP ANALYSIS	FIELD ANALYSIS	LABORATORY ANALYSIS	GENERALIZED LITHOLOGY	LITHOLOGIC DESCRIPTION AND REMARKS	DATE
From		to		BIT	RATE	feet	ins.							
feet	ins.	feet	ins.											
32		33								1		~ [ ]	As above	
33		34								1		~	As above	
34		35								1		[ ] ~	As above	
35		36								1		~	As above	
36		37								1		[ ] ~	As above	
37		38								1		~	As above	
38		39								1		[ ] ~	As above, with increasing dark grey to purple limestone, chert wanting, still phosphatic	
39		40								1		[ ] ~	As above	
40		41								1		~	As above	
41		42								1		[ ] ~	As above	
42		43								1		~	As above	
43		44								1		[ ] ~	As above	
44		45								1		[ ] ~	As above	
45		46								1		[ ] ~	As above	
46		47								1		~	As above	
47		48								1		[ ] ~	As above	
48		49								1		~	As above	
49		50								1		[ ] ~	As above	
50		51								1		[ ] ~	As above	
51		52								1		~	As above	

DRILLED DEPTH				BIT		CORE RECOVERED		% CORE RECOVERY	CHIP ANALYSIS	FIELD ANALYSIS	LABORATORY ANALYSIS	GENERALIZED LITHOLOGY	LITHOLOGIC DESCRIPTION AND REMARKS	DATE
From		to		BIT	RATE	feet	ins.							
feet	ins.	feet	ins.											
52		53								1			LIMESTONE, med. grey colour, still phosphatic but less than	
												Δ	above siltstone - chert minor (? nodular) black colour, with	
												~ Δ	minor interbedded med. brown siliceous (slightly) siltstone	
53		54								1			As above	
54		55								1		Δ	As above	
55		56								1		Δ ~	As above	
56		57								1		Δ	As above	
57		58								1		Δ ~	As above	
58		59								1		Δ	As above	
59		60								1		~ Δ	As above	
60		61								1		Δ	As above	
61		62								1			As above	
62		63								1			As above	
63		64								1		Δ	As above	
64		65								1			As above	
65		66								1		~ Δ	As above, with some soft dark grey siltstone calcareous	
66		67								1			As above	
67		68								1			As above	
68		69								1		Δ	As above	
69		70								1			As above	
70		71								1			As above	



DRILLED DEPTH				BIT		CORE RECOVERED		% CORE RECOVERY	CHIP ANALYSIS	FIELD ANALYSIS	LABORATORY ANALYSIS	GENERALIZED LITHOLOGY	LITHOLOGIC DESCRIPTION AND REMARKS	DATE
From		to		BIT	RATE	feet	ins.							
feet	ins.	feet	ins.											
71		72								1		Δ	As above	
72		73								1		Δ ~	As above	
73		74								1		~ Δ	As above	
74		75								1		Δ	As above	
75		76								1			As above	
76		77								1			As above	
77		78								2		Δ	As above	
78		79								1			As above	
79		80 T.D.								1		Δ	As above	

CONTINENTAL OIL COMPANY OF AUSTRALIA LTD.

MINERAL EXPLORATION DIVISION

GEOLOGICAL LOG OF DRILL HOLE

OWNER: CONTINENTAL OIL COMPANY OF AUSTRALIA LTD.  
 PROJECT: PLAYFORD BASIN PHOSPHATE  
 HOLE No.: ALROY No. 5  
 STATE: NORTHERN TERRITORY COUNTY:  
 PARISH: HOLDING: 1874  
 LAT.: LONG.: CO-ORDINATES:  
 INCLINATION: Vertical Approx. 4 miles due North of Alroy  
 TOTAL DEPTH: 126 feet Bore No. 10

ROTARY DRILLING: Depth from 0 to 126  
 DIAMOND CORE DRILLING: Depth from to  
 DRILLING: Depth from to  
 GROUND LEVEL: Approx. 750'  
 DRILLING CONTRACTOR: Austral Geo Prospectors Ltd., Brisbane, Qld.  
 SPUDED: September 20, 1968  
 COMPLETED: September 20, 1968  
 GEOLOGIST: M.D. Campbell

DRILLED DEPTH				BIT		CORE RECOVERED	% CORE RECOVERY	CHIP ANALYSIS	FIELD ANALYSIS	LABORATORY ANALYSIS	GENERALIZED LITHOLOGY	LITHOLOGIC DESCRIPTION AND REMARKS	DATE
From		to		BIT	RATE								
feet	ins.	feet	ins.					feet	ins.				
0		10						X			Soil +	SOIL, medium brown, clayey, gypsum crystals.	
10		17						X			Δ + Δ	SILTSTONE, calcareous, white, gypsum crystals with chert (brown)	
17		24						X			Δ Δ	SILTSTONE, calcareous, white to tan colour, with dark red brown chert.	
24		28						X			Δ Δ	SILTSTONE, Calcareous, white to tan colour, with brown chert.	
28		29						X			Δ Δ	SILTSTONE, medium brown colour, otherwise as above.	
29		64							1		Δ Δ	SILTSTONE, white, soft with dark red brown chert, calcareous, some grey chert, slightly phosphatic.	
64		67							1		Δ Δ	As above, but colour change to medium brown.	
67		80							1		Δ Δ	SILTSTONE, white to light brown, red brown chert, soft slightly calcareous.	
80		90									Δ Δ	SILTSTONE, white to light brown, red brown chert, brown-black chert, only slightly calcareous, medium soft, slightly phosphatic only	



CONTINENTAL OIL COMPANY OF AUSTRALIA LTD.

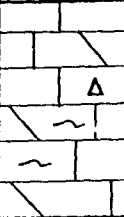
MINERAL EXPLORATION DIVISION

GEOLOGICAL LOG OF DRILL HOLE

OWNER: CONTINENTAL OIL COMPANY OF AUSTRALIA LTD.  
 PROJECT: PLAYFORD BASIN PHOSPHATE  
 HOLE No.: ALROY No. 6  
 STATE: NORTHERN TERRITORY COUNTY:  
 PARISH: HOLDING: 1874  
 LAT.: LONG.: CO-ORDINATES:  
 INCLINATION: Vertical Approx. 8 miles Southwest of Alroy Bore  
 TOTAL DEPTH: 105 feet No. 10 (within sight of Alroy Homestead)

ROTARY DRILLING: Depth from 0 to 105  
 DIAMOND CORE DRILLING: Depth from to  
 DRILLING: Depth from to  
 GROUND LEVEL: Approx. 750'  
 DRILLING CONTRACTOR: Austral Geo Prospectors Ltd., Brisbane, Qld.  
 SPUDED: September 20, 1968  
 COMPLETED: September 20, 1968  
 GEOLOGIST: M.D. Campbell

DRILLED DEPTH				BIT		CORE RECOVERED	% CORE RECOVERY	CHIP ANALYSIS	FIELD ANALYSIS	LABORATORY ANALYSIS	GENERALIZED LITHOLOGY	LITHOLOGIC DESCRIPTION AND REMARKS	DATE
From		to		BIT	RATE								
feet	ins.	feet	ins.					feet	ins.				
0		7						X			Soil }	SOIL, medium brown, clayey, gypsum crystals; slightly calcareous.	
7		32						VST	1		~ Δ ~ Δ Δ ~ ~ Δ	SILTSTONE, cream colour, slightly calcareous, medium hard with chert (nodular (?)) - brown - tertiary (?) chert varied coloured redish brown and black.	
32		36						VST	1		Δ ~ ~ H Δ ~	SILTSTONE, light ochre colour, non calcareous, chert as above.	
36		70						X			~ Δ ~ Δ Δ ~ ~	SILTSTONE, non calcareous, slightly calcareous, dark red to light red at bottom, talcose, medium soft with inter-bedded black chert.	
70		85						X			~ Δ Δ ~ ~	SILTSTONE, slightly calcareous, light red to dark red to medium brown, with minor fragments of light grey siliceous; silty carbonate (dolomitic?) or siliceous siltstone chert brown to black (grey).	

DRILLED DEPTH				BIT		CORE RECOVERED		% CORE RECOVERY	CHIP ANALYSIS	FIELD ANALYSIS	LABORATORY ANALYSIS	GENERALIZED LITHOLOGY	LITHOLOGIC DESCRIPTION AND REMARKS	DATE
From		to		BIT	RATE	feet	ins.							
feet	ins.	feet	ins.											
85		105 T.D.							VST	1			 Limestone, light brown, partly siliceous (medium hard) and/or dolomitic, chert minor (inter-bedded brown to grey - little black. Occasional siltstone, slightly siliceous, non calcareous, dark brown, inter-bedded.	

DRILLED DEPTH				BIT		CORE RECOVERED		% CORE RECOVERY	CHIP ANALYSIS	FIELD ANALYSIS	LABORATORY ANALYSIS	GENERALIZED LITHOLOGY	LITHOLOGIC DESCRIPTION AND REMARKS	DATE
From		to		BIT	RATE	feet	ins.		Qual.	Semi Quan.	Quan.			
feet	ins.	feet	ins.											
12		13							X			Soil	As above, w/very small crystals of gypsum and more calcareous	
		14							X			Soil	As above, with colour change to light grey - light brown, with increase Rd-bn chert frags.	
		15							X				As above	
		16							X				Clay, very silty, mustard colour - heavily weathered profile (?weathered limestone) with Rd-bn chert (rounded) very calcareous	
		17							X				As above	
		18							X				As above	
		19			M				X				Limestone, white to light grey, silty and soft very weathered (?) w/rounded Rd-bn chert (? nodular)	Recent (?)Tertiary
		20							X				As above, calcite crystals	
		21							X				As above	
		22							X				As above, less weathered and harder	
		23							X				As above	
		24							X				As Above, still with chert, as above	
		25							X				As above, becoming less crystalline and more silty	
		26							X				As above	
		27			F				X				Siltstone, light grey to dark khaki, very weathered in places and very calcareous	
		28							X				As above, very soft, no chert	

PART II

AUTHORITY TO PROSPECT 2081

(SYLVESTER AREA)

NORTHERN TERRITORY

AUSTRALIA

INTRODUCTION

This report is a summary of the drilling activities carried out on behalf of the Mineral Exploration Division of the Continental Oil Company of Australia Ltd. in Authority to Prospect 2081. The tenement was taken out to cover an area of approximately 2,600 square miles immediately to the west of Authority to Prospect 1874 (Part I of this report) on the basis that a possible extension of the phosphate beds may continue to the west.

During the 1968 drilling programme, widely spaced exploratory holes were drilled to define more clearly the regional aspects of the phosphate occurrence in the east. No significant phosphate has been discovered in the area to date, but indications are encouraging.

DRILLING

Austral Geo Prospectors Pty. Ltd., Brisbane, Queensland were engaged to air drill a six (6) hole exploratory programme in the tenement area and in conjunction with the drilling programme in A. to P. 1874.

In all, 4 holes were drilled for a total footage of 458 feet. All holes were completed. However, additional holes were planned, but due to a major rig break-down, the drilling campaign was halted on September 22, 1968.

The following table is a summary of the drilling in A. to P. 2081:-

TABLE I

(See Plate I)

<u>Hole</u>	<u>Total Depth</u>	<u>Hole Status</u>
Sylvester No. 1	181 feet	Completed
Sylvester No. 2	173 feet	Completed
Sylvester No. 3	44 feet	Completed
Sylvester No. 4	60 feet	Completed
Sylvester No. 5	-	Not spudded
Sylvester No. 6	-	Not spudded
Total number holes completed:	4	
Total number holes lost:	Nil	
Total footage drilled	458 feet	



## LOGGING AND TESTING

Geological logging of the holes drilled was preformed by R. Grasso (Minoil Services Ltd., Adelaide) and the writer. R. Shields of Mt. Isa was employed as Field Assistant.

The lithologic logging was relatively simple, allowing for only a brief description of the lithology encountered. If a detailed study becomes necessary, all of the cuttings will be relogged with a binocular microscope. Cuttings of all holes drilled in the tenement area will be offered to the Geological Section, Mines Branch, Northern Territory Administration in Darwin.

Chip testing using the standard vanadomolybdate reagent was used as a qualitative test for phosphate. When a positive result was encountered, a complete field Shapiro was run on each foot sample while drilling was in progress. Those samples testing over 4%  $P_2O_5$ , or appearing mineralogically interesting, were later sent to Minex, Melbourne and A.M.D.E.L. Adelaide for detailed analysis.

## RESULTS

Lithologic logs and a plan showing well-site locations are included in this section of the report as Appendix II and Plate I.

As previously mentioned in Part I, an assessment of the local geology within the tenement areas is presently premature. Since only four holes were completed in the Sylvester area, only preliminary statements can be made at this date.

Sylvester No. 1 encountered a predominantly cherty siltstone section overlying intervals of possible continental sediments of highly weathered, red shaly and micaceous siltstone. A dolomitic and cherty carbonate underlies the red shaly siltstone. A tentative correlation can be made between this hole and Alroy No. 6 to the east. Only the red shaly siltstone and underlying carbonate contains any trace of phosphate, i.e. not greater than 1%  $P_2O_5$ .

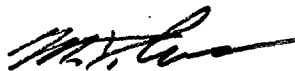
Sylvester No. 2 found a very sandy section with intervals of red to brown cherty and shaly siltstone. Only minor carbonate development is recorded near the top of the section. Phosphate content is nil throughout the section.

Sylvester No. 3 was drilled to assess the lithology of the Wonarah Beds which outcrop around the well-site (see Plate I). A cherty and very siliceous siltstone is recorded near the top of the section. Below this interval, however, a very sandy section overlying a red to red-brown micaceous siltstone was encountered. The entire section is non phosphatic.

Alroy No. 4 also is a sandy and red, micaceous siltstone section. An encouraging section of light brown siltstone, interbedded with brown chert was encountered near the top of the hole. Phosphate content however, is nil throughout the section.

SUMMARY

As in A. to P. 1874, during the 1969 field season, an expanded drilling campaign has been proposed for this tenement. While significant phosphate has not been discovered to date, drilling coverage of the area is presently insufficient and an extension of the phosphate found in A. to P. 1874 still appears possible in selected areas.



M.D. CAMPBELL

October 1, 1968

APPENDIX II

Lithologic Logs

Sylvester No. 1

Sylvester No. 2

Sylvester No. 3

Sylvester No. 4

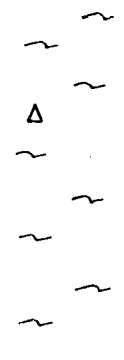
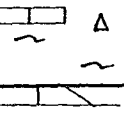
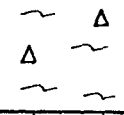
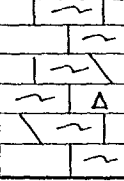
CONTINENTAL OIL COMPANY OF AUSTRALIA LTD.  
MINERAL EXPLORATION DIVISION

GEOLOGICAL LOG OF DRILL HOLE

OWNER: CONTINENTAL OIL COMPANY OF AUSTRALIA LTD.  
 PROJECT: SYLVESTER AREA  
 HOLE No.: SYLVESTER No. 1  
 STATE: NORTHERN TERRITORY COUNTY:  
 PARISH: HOLDING: A to P. 2081  
 LAT.: LONG.: CO-ORDINATES:  
 INCLINATION: Vertical Approx. 1 mile South of Alroy Bore  
 TOTAL DEPTH: 181 feet No. 5

ROTARY DRILLING: Depth from 0 to 181  
 DIAMOND CORE DRILLING: Depth from to  
 DRILLING: Depth from to  
 GROUND LEVEL: Approx. 720 feet  
 DRILLING CONTRACTOR: Austral Geo Prospectors Ltd., Brisbane, Qld.  
 SPUDED: September 20, 1968.  
 COMPLETED: September 20, 1968  
 GEOLOGIST: M.D. Campbell

DRILLED DEPTH				BIT		CORE RECOVERED	% CORE RECOVERY	CHIP ANALYSIS	FIELD ANALYSIS	LABORATORY ANALYSIS	GENERALIZED LITHOLOGY	LITHOLOGIC DESCRIPTION AND REMARKS	DATE
From		to		BIT	RATE								
feet	ins.	feet	ins.					feet	ins.				
0		4						X			Soil +	SOIL, dark brown gypsum crystals, slightly calcareous, clayey.	
4		20						X			Soil ~	SOIL, medium brown, calcareous (weathered siltstone (?))	
20		45						X			~ Δ	SILTSTONE, light grey, ivory, minor light grey; black chert, non calcareous to slight calcareous, talcose in places, fine grained quartz in places, well rounded - soft to slightly siliceous.	
45		47						X			~ Δ	SILTSTONE, light grey, soft, abundant light grey black and red brown chert - slight siliceous in places - calcareous - generally very soft.	
47		91						X			~ Δ	SILTSTONE, white to medium brown to light brown to red brown, chert - very minor if not wanting, soft to medium hard - non calcareous, very soft.	

DRILLED DEPTH				BIT		CORE RECOVERED		% CORE RECOVERY	CHIP ANALYSIS	FIELD ANALYSIS	LABORATORY ANALYSIS	GENERALIZED LITHOLOGY	LITHOLOGIC DESCRIPTION AND REMARKS	DATE
From		to		BIT	RATE	feet	ins.							
feet	ins.	feet	ins.											
91		120								1			<p>SILTSTONE, red to red brown to light brown to chocolate to ochre chert very minor in places (black variety) - non calcareous -</p> <p>Sample 1 - 95 feet</p> <p>Sample 2 - 96 feet</p> <p>Sample 3 - 110 feet</p> <p>Sample 4 - 119 feet</p>	
													<p>becoming slightly calcareous at bottom, dolomitic (?) carbonate, light brown - slightly phosphatic.</p>	
120		166								1			<p>SILTSTONE, light brown, slightly calcareous, with brown and black chert, slightly phosphatic.</p>	
166		181 T.D.								1			<p>LIMESTONE, very silty dolomitic (?) - slightly platy, chert very minor, light grey colour - still slightly phosphatic (water at 181 feet).</p>	

CONTINENTAL OIL COMPANY OF AUSTRALIA LTD.





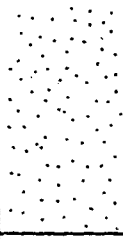

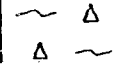
MINERAL EXPLORATION DIVISION


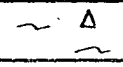
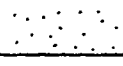
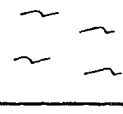

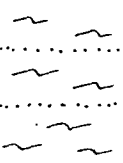
GEOLOGICAL LOG OF DRILL HOLE

OWNER: CONTINENTAL OIL COMPANY OF AUSTRALIA LTD.  
 PROJECT: SYLVESTER AREA  
 HOLE No.: SYLVESTER No. 2  
 STATE: NORTHERN TERRITORY COUNTY:  
 PARISH: HOLDING: A to P 2081  
 LAT.: LONG.: CO-ORDINATES:  
 INCLINATION: Vertical Approx. 1/2 mile due South of Alroy  
 TOTAL DEPTH: 173 feet bore No. 30

ROTARY DRILLING: Depth from 0 to 173  
 DIAMOND CORE DRILLING: Depth from to  
 DRILLING: Depth from to  
 GROUND LEVEL: Approx. 715 feet  
 DRILLING CONTRACTOR: Austral Geo Prospectors Ltd., Brisbane, Qld.  
 SPUDDED: September 21, 1968  
 COMPLETED: September 21, 1968  
 GEOLOGIST: M.D. Campbell

DRILLED DEPTH				BIT		CORE RECOVERED		% CORE RECOVERY	CHIP ANALYSIS	FIELD ANALYSIS	LABORATORY ANALYSIS	GENERALIZED LITHOLOGY	LITHOLOGIC DESCRIPTION AND REMARKS	DATE
From		to		BIT	RATE	feet	ins.							
feet	ins.	feet	ins.											
0		6							X			Soil } + Soil }	SOIL, dark grey, non calcareous, slightly gypsiferous, clayey, with fine grained quartz, sub rounded and ferruginous pebbles very minor.	
6		21							X				LIMESTONE, very silty in places, crystalline in places, highly weathered in places. White to light grey in colour, calcareous only in places; with red-brown silty shale towards bottom, non calc. with brown chert (silicified shale?)	
21		37							X				SILTSTONE, light pink to light brown to medium red to light grey colour, medium hard in places, soft also in places. Chert wanting. Fine grained quartz in siltstone matrix. Very ferruginous in places.	

DRILLED DEPTH				BIT		CORE RECOVERED		% CORE RECOVERY	CHIP ANALYSIS	FIELD ANALYSIS	LABORATORY ANALYSIS	GENERALIZED LITHOLOGY	LITHOLOGIC DESCRIPTION AND REMARKS	DATE
From		to		BIT	RATE	feet	ins.							
feet	ins.	feet	ins.											
37		49							X			 SILTSTONE, interbedded with a sand sandstone at top becoming a sand sandstone at bottom. Siltstone light red colour, non calc. chert (brown) minors, ferruginous in places - siltstone becoming sandy then to a clear sand to sand stone (soft) - sand; light brown to white in colour.		
49		57							X			 SILTSTONE, very sandy in places, light brown to light grey with dark grey and lightbrown chert (interbedded (?)) non calcareous very soft in places, very siliceous in places.		
57		61							X			 SANDSTONE, very soft light grey, non calc. minor siltstone at bottom, chert abundant (brown and black)		
61		77							X			 SILTSTONE, light brown to red brown very soft - non calc. minor intervals of brown chert - also minor light grey quartzite towards bottom.		
77		85							X			 QUARTZITE, light grey, quartz grains in a siliceous matrix - very tight, with interbeds of silty and softer quartzite of same colour - brown chert in silty parts. All quartz grains of similar size and shape.		
85		90							X			 SILTSTONE, light grey, medium hard, non calc. with brown chert slightly micaceous.		
90		98							X			 SILTSTONE, micaceous, med. red brown, minor brown chert, non calc., with minor quartz grains in matrix.		

DRILLED DEPTH				BIT		CORE RECOVERED		% CORE RECOVERY	CHIP ANALYSIS	FIELD ANALYSIS	LABORATORY ANALYSIS	GENERALIZED LITHOLOGY	LITHOLOGIC DESCRIPTION AND REMARKS	DATE
From		to		BIT	RATE	feet	ins.							
feet	ins.	feet	ins.											
98		104							X				SAND, unconsolidated, partly silty, non calc. siltstone, minor quartz grains poorly sorted and angular.	
104		111							X				SILTSTONE, (as at 90 - 98)	
111		120							X				SAND, (as at 98 to 104)	
120		129							X				SILTSTONE, light khaki colour, with minor quartzite (chert?) very minor.	
129		140							X				SANDSTONE, medium level, as above (111 to 120) with brown chert and siltstone, light brown interbeds, becoming a red silty sand at bottom.	
140		173 T.D.							X				SILTSTONE, medium red brown colour, non calc. chert wanting. Partly micaceous with minor sandy intervals. Very poor returns. Struck water.	



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GEOLOGICAL LOG OF DRILL HOLE

OWNER: CONTINENTAL OIL COMPANY OF AUSTRALIA LTD.  
 PROJECT: SYLVESTER AREA  
 HOLE No.: SYLVESTER No. 3  
 STATE: NORTHERN TERRITORY COUNTY:  
 PARISH: HOLDING: A to P 2081  
 LAT.: LONG.: CO-ORDINATES:  
 INCLINATION: Vertical Approx. 1/2 mile West of Alroy Bore  
 TOTAL DEPTH: 44 feet No. 8

ROTARY DRILLING: Depth from 0 to 44  
 DIAMOND CORE DRILLING: Depth from to  
 DRILLING: Depth from to  
 GROUND LEVEL: Approx. 750 feet  
 DRILLING CONTRACTOR: Austral Geo Prospectors Ltd., Brisbane, Qld.  
 SPUDED: September 22, 1968  
 COMPLETED: September 22, 1968  
 GEOLOGIST: M.D. Campbell

DRILLED DEPTH				BIT		CORE RECOVERED		% CORE RECOVERY	CHIP ANALYSIS	FIELD ANALYSIS	LABORATORY ANALYSIS	GENERALIZED LITHOLOGY	LITHOLOGIC DESCRIPTION AND REMARKS	DATE
From		to		BIT	RATE	feet	ins.							
feet	ins.	feet	ins.											
0		3							X			Soil ~ Δ ~ Δ	SOIL AND SILICIFIED SILTSTONE SOIL, medium red partly clayey with abundant silicified siltstone, light to medium brown, chert (brown) common; all non calcareous.	
3		5							X			~ Δ ~ Δ	SILTSTONE, medium red brown micaceous, platy chips, non calc. with chert (brown) minors.	
5		11							X			~ Δ Δ ~ ~ Δ	SILTSTONE, light khaki to off white, very siliceous, brown chert common.	
11		39							X			~ ~ ~ ~ ~ ~	QUARTZITE, very silty in places, light brown at top to white at bottom, very tight, chert wanting, very hard in places.	
39		41							X			~ ~ ~ ~ ~ ~	SILTSTONE, sandy in places non calc. chert wanting, medium soft light brown colour.	
41		44 T.D.							X			~ ~ ~ ~ ~ ~	SILTSTONE, light to med. red-brown, non calc., clayey in parts and generally soft - micaceous in parts.	

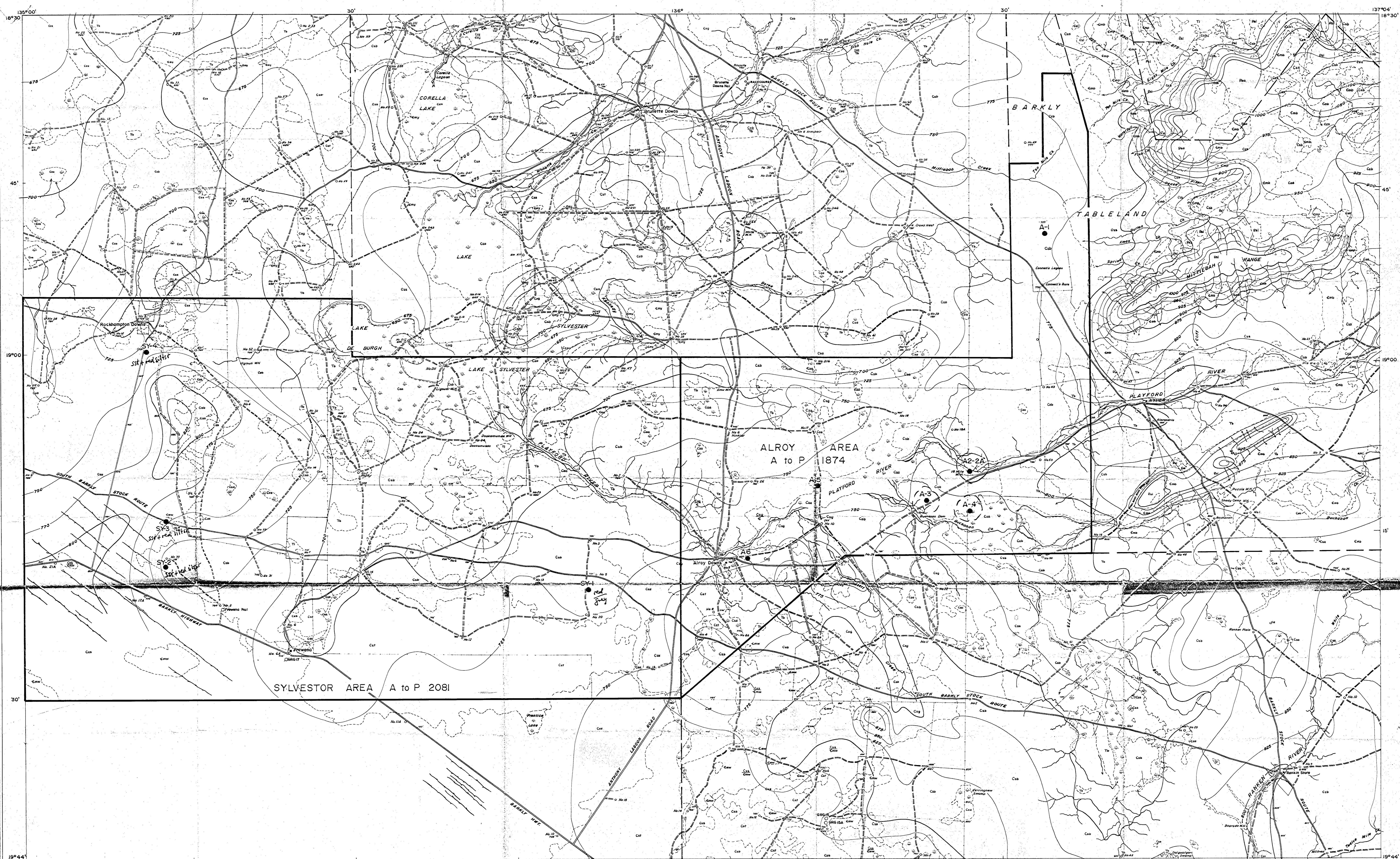
CONTINENTAL OIL COMPANY OF AUSTRALIA LTD.  
MINERAL EXPLORATION DIVISION

**GEOLOGICAL LOG OF DRILL HOLE**

OWNER: CONTINENTAL OIL COMPANY OF AUSTRALIA LTD.  
 PROJECT: SYLVESTER AREA  
 HOLE No.: SYLVESTER No. 4  
 STATE: NORTHERN TERRITORY COUNTY:  
 PARISH: HOLDING: A to P 2081  
 LAT.: LONG.: CO-ORDINATES:  
 INCLINATION: Vertical Approx. 4 miles due South of  
 TOTAL DEPTH: 60 feet Rockhampton Downs

ROTARY DRILLING: Depth from 0 to 60  
 DIAMOND CORE DRILLING: Depth from to  
 DRILLING: Depth from to  
 GROUND LEVEL: Approx. 750 feet  
 DRILLING CONTRACTOR: Austral Geo Prospectors Ltd., Brisbane, Qld.  
 SPURRED: September 22, 1968  
 COMPLETED: September 22, 1968  
 GEOLOGIST: M.D. Campbell

DRILLED DEPTH				BIT		CORE RECOVERED		% CORE RECOVERY	CHIP ANALYSIS	FIELD ANALYSIS	LABORATORY ANALYSIS	GENERALIZED LITHOLOGY	LITHOLOGIC DESCRIPTION AND REMARKS	DATE
From		to		BIT	RATE	feet	ins.							
feet	ins.	feet	ins.											
0		6							X			Soil	BUCK SHOT GRAVEL AND SOIL, red brown colour, highly ferruginized, non calc. chert wanting.	
6		30							X			~ Δ ~	SILTSTONE, light brown to medium brown, medium soft, chert (brown) abundant, non calc. shaly in places.	
30		51							X			~ ~ ~	QUARTZITE, very silty in places, minor brown chert (cavings?) non calcareous (as in Hole 9)	
51		55							X			~ Δ ~	SILTSTONE, non calc. medium brown colour, chert light brown colour common, platy chips, partly siliceous, partly quartzitic.	
55		60 T.D.							X			~ ~ ~	SILTSTONE, non calc. medium red colour, chert wanting, siliceous, micaceous and very platy chips - looks like protozoic sediments(?).	



CAINOZOIC		PALAEOZOIC		
Cca	Alluvium including river gravels, some black soil.	Undifferentiated	€	Limestone, chert, dolomite, sandstone.
Ccb	Black and grey clayey soils, some sand and gravel.	Undifferentiated	€m	Fossiliferous crystalline, dolomite & chert.
Ccg	Gravel, pebbles of psittacite ironstone and chert.	Anthony Lagoon Beds	€my	Dolomite & dolomitic limestone, with chert nodules & bands, algal dolomitic limestone, ferruginous grey & white quartz sandstone & siltstone.
Ccl	Laterite, lateritic soil.	Burton Beds	€mb	Fossiliferous siltstone & chert, calcarenite, coquinae, crystalline limestone, shale and minor sandstone.
Cct	Travertine, some detrital laterite.	Wonarran Beds	€mw	Fossiliferous silicified limestone & dolomite, siltstone, chert, silicified shale, leached carbonate.
Ccs	Mainly sand, black soil, gravel, travertine, detrital laterite.	Peaker Plier Volcanics	€mp	Basalt, trachyte, minor dolerite, quartz sandstone.
Td	Nodular white limestone, silicified in part and containing chert nodules & bands. Minor quartz sandstone & conglomerate.	Ranken Limestone	€mk	Silicified & crystalline limestone, some chert nodules.
Tl	Laterite, mainly ferruginous sandstone & siltstone, leached carbonates, some gravel & sand.	Mitriebah Sandstone	€m	Cross-bedded quartz sandstone, rare pebbles & cobbles.
		Mullera Formation	€ml	Siltstone, shale, quartz sandstone, glauconitic sandstone, feldspathic sandstone, ferruginous sandstone, ironstone.

**REFERENCE**

- Topographic contours (Contour interval 25 ft.)
- Geological boundaries
- Sand dunes
- Stratigraphic hole (B.M.R.)
- Swamp
- Road
- Vehicle track
- Fence
- Homestead
- Frewend
- Yard
- Height in feet - Datum: mean sea level
- Water bare
- Water hole
- A to P boundaries (Others)
- A to P boundaries (ConAus)
- Hole Locations (Alroy No.2)

CONTINENTAL OIL COMPANY AUSTRALIA LTD.  
 MINERALS EXPLORATION DIVISION  
**ALROY - SYLVESTER AREA**  
 PLATE I  
 AUTHORITY TO PROSPECT 1874 & 2081  
 NORTHERN TERRITORY

SCALE: 1:250,000  
 1" = 3.945 Miles

BY: M. D. CAMPBELL DATE: October 1968

Map based on B.M.R. Geological Series

CR 68/16