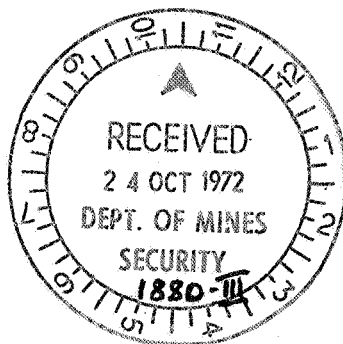


ASARCO (AUSTRALIA) PTY. LTD.

BORE - SAMPLE ANALYSES
SOUTH AUSTRALIA

Prepared by consultant geologist
S.B. Warne of Overland Enterprise Pty Ltd.
for Asarco (Australia) Pty Ltd.



Adelaide
February 1972.

Adelaide Office
Technical Report
Copy No.

CONTENTS ENVELOPE 1880.D.M.131/71.TENEMENT NOT RELATEDTENEMENT HOLDER ASARCO (AUST) PTY. LTD.REPORT

Bore-sample Analysis South Australia.

(pgs.3-39)

REPORTAlphabetic List of all Bores and Wells Sampled
for Assay Purposes.

(Period: 1 October 1971, to 30th, December 1971.)

(pgs.11-20)

APPENDIX 1.Report on Contamination of Samples - Bore Survey
(1971-1972)

(pgs.21-31)

APPENDIX 2.Results - Microscopic examination of cuttings -
Eucla Basin Maralinga Area.

(pgs.32-39)

PLANS

F.1. Tectonic Framework of Southern Australia.

(pg.18)

F.2. Precambrian Basement Contours - Lines & other
Structural Features South Aust.

(pg.19)

F.3. Basement Structures - Northern Gawler Craton.

(pg.20)

488. Bore Location SH52.

(1880-(1)-1.

485. " " SI53.

(1880-(1)-2.

487. " " SH53.

(1880-(1)-3.

486. " " SG53.

(1880-(1)-4.

483. " " SG54.

(1880-(1)-5.

484. " " SH54.

(1880-(1)-6.

490. " " SI54.

(1880-(1)-7.

489. " " SI55.

(1880-(1)-8.

507. Asarco Plan.

(1880-(1)-9.

508. " "

(1880-(1)-10.

509. " "

(1880-(1)-11.

510. " "

(1880-(1)-12.

NOTE. Plans marked Vol. 2. on film in error.

REPORT

Bore Sample Analysis South Australia.

No plans.

(pgs.40-133)

REPORT

Bores of the Northern Eucla Basin & Maralinga Area.

No plans.

(pgs.134-247)

REPORT

Great Artesian Basin Deep Stratigraphic Bores
of the Cooper Basin Area.

(pgs.176-247)

PLANS

F.9. Gidgealpa Anticline. S.A.

(pg.238)

REPORT

Great Artesean Basin Frome Embayment - Delhi -
Santos Stratigraphic Bores.

No plans.

(pgs.248-359)

REPORT

Eucla Basin - Southern Section.

(pgs.274-297)

REPORT

Gawler Craton - Norther Area.

No plans.

(pgs.298-317)

REPORT

Lake Phillipson Trough - Arkaringa Sub-basin
of the Great Artesean Basin.

No plans.

(pgs.318-324)

REPORT

Gawler Craton - Tarcoola Beds, Tarcoola

No plans.

(pgs.330-344)

REPORT

Miscellaneous Bores.

No plans.

(pgs.345-359)

REPORT

Stuart Shelf.

No plans.

(pgs.360-498)

REPORT

A.E. FRANCIS. 1972.

Report AN961/72

No plans.

(pgs.411-414)

REPORT

Bore and Well Spoil Samples -

Western Stuart Shelf Area.

No plans.

(pgs.415-436)

REPORT

Annual Report on Special Mining Lease No.55.

Pernatty Lagoon - Woocalla, Mt. Gunson, S.A.

(pgs.437-469)

PLANS.

F.1. Pernatty Lagoon Woocalla - Induced Polarisation &
Geochemical Surveys.

(pgs.468-469-
467.)

REPORT

Pernatty Lagoon - report for the six months ending

(Period: December 15th, 1969)

No plans.

(pgs.470-473)

REPORT

Special Mining Lease 315. - Stuart's Bluff Minerals

Pernatty Lagoon, S.A. Report on exploration.

(Period: April 30th, 1970.)

(pgs.474-498)

PLANS.

F.1. Locality Map.

(pg.477.)

F.2. Tectonic Map of Region Surrounding S.M.L.315.

(pg.479)

F.3. Seismic Survey S.M.L.315. - Isopach Map.

(pg.487.)

F.4. Drilling Programme - Bore Location Map.

(pg.488.)

ASARCO (AUSTRALIA) PTY LTD.
BORE-SAMPLE ANALYSES SOUTH AUSTRALIA.

CONTENTS

Page No.

1. Introduction.
2. Sampling Procedures
 - 2.1 Cuttings/Sludge Samples
 - 2.2 Old E. & W.S. Samples
 - 2.3 Diamond Drill Core
3. Recording of Data
 - 3.1 Bore Hole Record Sheets
 - 3.2 Bore Hole Assay Sheets
 - 3.3 General.
4. Alphabetic list of Bores and Wells Sampled for Assay Purposes 1 Oct. 1971 to 30 Dec. 1971

Appendix I Sample contamination

Appendix 2 Results

PLANS

Plan No.	Title
-	South Australia Geology.
-	South Australia Structure.
-	South-west Australia Tectonics.
-	Northern Gawler Craton Structure.
483	Bore locations SG 54
484	Bore locations SH 65
485	Bore locations SI 53
486	Bore locations SG 53
487	Bore locations SH 53
488	Bore locations SH 52
489	Bore locations SJ 55
490	Bore locations SI 54
507	Borehole locations Pastoral plan sheet No. 13
508	Borehole locations Pastoral plan sheet No. 14
509	Borehole locations Pastoral plan sheet No. 15
510	Borehole locations Pastoral plan sheet No. 18

Plans Nos. 483 to 490 and 507 to 510
are in pocket at back of report.

1. INTRODUCTION.

Approval was obtained by Asarco (Australia) Pty. Ltd. from the Director of Mines in a letter dated 26th August, 1971 (D.M. 131/71) to commence a systematic study of core and other samples held by the South Australian Department of Mines in the core laboratory at West Thebarton and at the head office in Rundle Street, Adelaide. The approval was subject to the following conditions :

1. Destructive assays of samples could be made only if sufficient sample was available.
2. All records and analyses obtained by Asarco be accessible to the Mines Dept. at all times during the study, and that copies of maps, records and analyses be given to the Mines Department after the completion of the first phase of the project (approximately three months from the date of commencement).

Under instruction from M. Kriewaldt, Senior Geologist, Asarco (Australia) Pty. Ltd. the study was commenced by Overland Enterprise Pty. Ltd. geologist, on 30th Sept. 1971.

Personnel engaged in the project were :

S.B. Warne.

Overland Enterprise Pty. Ltd.,
Consultant Geologist.

K. Hartwick.

Asarco (Australia) Pty. Ltd.
(Design and fabrication of bore-
core sampling devices).

R. Royal.

Asarco (Australia) Pty. Ltd.,
technician. (Sampling of bore-
core and cuttings).

R. Hoff. Asarco (Australia) Pty. Ltd.,
student geologist. (Initial
log Bada Bore; selective sampling).

R. Barnes.) Asarco (Australia) Pty. Ltd.,
A. Buck. } student geologists. (Sampling of
G. Drew.) bore-core and cuttings; literature
A. Ross.) search).

Assays were carried out by the Australian Mineral Development Laboratories, Flemington St., Frewville, and all microscopy by Central Mineralogical Services, 231 Magill Road, Maylands, S.A.

Permission to view and sample core and cuttings from Officer No. 1 and Birksgate No. 1 Wells was given by Exoil N.L. provided copies of any assays were made available to them.

To the end of December 1971, samples were assayed from 97 bore holes, the majority being of a purely stratigraphic nature. In addition 113 well spoil samples were assayed from the western Stuart Shelf area.

2. SAMPLING PROCEDURES.

2.1 Cuttings/Sludge Samples.

Approximately 1.5 to 2 gram portions of bore-hole samples were taken from packages housed at the S.A. Dept. of Mines, West Thebarton core laboratory. Equal volumes were taken using a small plastic spoon; where expediant individual sample volumes were combined to produce a bulk sample representing a greater bore footage.

Assays resulting from these samples must be evaluated with caution as, apart from up-hole contamination and drill mud impurities, microscopy shows they contain varying quantities of white paint flakes, and minute globules of metallic zinc (from a zinc-based anticorrosive paint). This contamination varies in magnitude from hole to hole depending on the condition of the drilling equipment used, the hardness of the formations drilled, the method of collection of the sample and probably other factors not as yet diagnosed. Investigations of this contamination are continuing.

2.2 Old E. & W.S. Samples.

The samples were obtained before and immediately after, the turn of the century from cable tool drilling, and stored in wooden boxes subdivided into compartments. Over the years some spillage of samples into adjoining compartments has occurred. There is however, no indication to date that this is a serious factor in assessing the metal contents of strata interpreted.

2.3 Core.

Where continuous lengths of diamond drill core were available these were sampled using a carborundum-fibreglass cutting wheel, mounted to an attachment normally used to cut asbestos sheeting,

* Engineering and Water Supply Department

2. SAMPLING PROCEDURES.

2.3 Core. (Cont.)

and coupled to a Sher portable electric drill. An adjustable cutting depth guide allowed the blade to cut a one eighth to one quarter inch groove along the core. The cutting was done inside a plastic bag slit down one side, allowing ground powder from the core to be thrown against the plastic, and later poured into a sample packet.

This arrangement was later modified to further facilitate the sampling of the large footage of core handled. The cutting wheel was mounted by a shaft to fixed bearings and belt driven by a one quarter horsepower electric motor. A guide to the blade allowed greater manual control over the core sections. A suitable cover around the blade deflected the sample downwards to a container.

Plates 1, 2 and 3, illustrate the two sampling devices used.

The only contaminant resulting from this method of sampling was from the cutting wheel. The wheels used were six inch Fiberloc Cutting-Off Wheels manufactured by Australian Abrasives Pty. Ltd., Auburn, N.S.W. 2144, Serial Number 37C24.

Atomic absorption analyses by AMDEL showed the wheel contained 15 ppm Cu, 5 ppm Pb, 30 ppm Zn, 5 ppm Co, 80 ppm Ni, 50 ppm Mn, 860 ppm Cr. Qualitative spectrographic analysis indicated Ca and Si where the major metal components of the wheel, Al a minor component, Na and Fe heavy traces 0.1 - 1%, Cr, Sr, Ti, B, Mg traces (100 - 1,000 ppm), Ni, V, K faint traces (10 - 100 ppm) and Cu, Pb, Li, very faint traces. (AMDEL JOB NO. 2373/72)

In hard, massive quartzites powder from the cutting wheel was visually estimated to be less than five percent of the total sample volume, while in soft carbonate rocks the amount of wheel powder contaminant was negligible.

2. SAMPLING PROCEDURES.

2.3 Core. (Cont.)

Samples have been submitted for assay to obtain further information on the extent of wheel contamination in the case of hard rocks.

In the case of fragmented or unconsolidated material small, similar size sample portions were taken at regular intervals, varying from three to six inches depending on the lithology and core section length.

3. RECORDING OF DATA.

3.1 Bore Hole Record Sheets.

These sheets are designed to be incorporated into general filing systems and allow additional data to be added as required. The bore log entered on these sheets was derived from the initial log found in Mines Dept. records, and in almost all cases such logs require reappraisal. References to later relogging or re-interpretations have been added as they became available, and copies of relevant publications in some cases supplement the record sheet. Following an assessment of the bore sample assays, the record sheets will require upgrading to include further reference information.

3.2 Bore Hole Assay Sheets.

These sheets are self explanatory. The lithology and formation columns in many instances require completion when logs for holes become available, and/or the stratigraphic units cut are clarified.

3.3 General.

At this stage the data record sheets are in a form which will provide a suitable basis for an assessment of the bore survey results. During the assessment, further information will accrue which will need to be added to the data sheets. Such additional information will be included as an addendum to assessment reports.

A S A R C O (A U S T R A L I A) P T Y. L T D.

4. Alphabetic List of all Bores and Wells Sampled

for

Assay Purposes

1 Oct. 1971 to 30 Dec. 1971.

BORE / WELL	Date	Driller	Latitude Longitude	Geologic Area.
ALABALA KAROO	pre 1914	E &WS	31° 27' 129° 36'	Eucla Basin
APPREETINA BORE		E &WS	27° 45' 134° 15'	Prot. ridge between Officer & Pedirka Basins.
BARATTA NO. 1			31° 54' 139° 28'	
BEDA BORE		E &WS	31° 58'30" 137° 26'00"	
BETOOTTA NO. 1	1960	Delhi- Santos	25° 42'30" 140° 49'46"	Great Artesian Basin.
BIRKSGATE NO. 1	1967	Contin. Oil	27° 56'20" 129° 48'10"	Officer Basin.
BLACK POINT NO. 1	1964	Beach Pet.	34° 37'13" 137° 54'19"	St. Vincent Gulf.
BOORTHANNA NO. 1			28° 56'04" 135° 45'18"	Arckaringa Sub- Basin.
BUTE NO. 5		D.M.		Yorke Peninsula.
COOK NO. 1		Outback Oil	30° 50'30" 130° 41'00"	Eucla Basin.
COOTANORINA NO. 1	1967	D.M.	28° 00'30" 135° 20'	Arckaringa Sub- Basin.
D. KERR WELL SPOIL SAMPLES	Sampled 1963	-	Various 113 Sample Sites	Great Artesian Basin Survey - Western Stuart Shelf Area.
DENMAN NO. 1		Outback Oil	30° 29'20" 129° 58'47"	Eucla Basin.
DULLINGARI NO. 1		Delhi	28° 07'55" 140° 52'30"	
EDITHBURGH NO. 1		Beach Pet.	35° 06'10" 137° 38'40"	Yorke Peninsula.
EMU NO. 1	1963	Exoil	28° 37'45" 132° 12'05"	Officer Basin.
EMU FLAT BORE 1		LRWE	28° 37'45" 132° 13'10"	Maralinga

BORE / WELL	Date	Driller	Latitude Longitude	Geologic Area.
GEOLOGIST WELL TARCOOLA	X	E&WS		Gawler Craton.
GIDGEALPA NO. 1		Delhi- Santos	27° 56'46" 140° 04'59.5"	Cooper Basin.
GIDGEALPA NO. 3		Delhi- Santos	27° 58'27.1" 140° 03'05"	Cooper Basin.
GRANGE NO. 1	1962	Beach Pet.	34° 49' 138° 29'	St. Vincent Gulf.
GUINEWARRA BORE		E&WS	31° 27' 129° 56'	Eucla Basin.
HUGHES NO. 1			30° 42' 129° 30'44"	Eucla Basin.
HUGHES N.W. NO. 2			30° 31'14" 129° 14'45"	Eucla Basin.
HUGHES N.E. NO. 3			30° 29'45" 129° 38'07"	Eucla Basin..
INNAMINCKA NO. 1	1960	Delhi- Frome- Santos	27° 29'21.3" 140° 55'07.7"	Cooper Basin.
KARKAROO NO. 1	1970	D.M.	28° 35'58" 133° 46'27"	Arckaringa Sub- Basin.
KERR McGEE A403/1		Kerr- McGee	30° 42' ? 134° 33'20" <i>incorrectly</i>	Gawler Craton. X
KERR McGEE A403/2A		"	33° 32'20" 136° 28'15"	Gawler Craton.
KERR McGEE A403/3		"	33° 32'20" 136° 28'15"	Gawler Craton.
KERR McGEE A405/1		"	33° 34'25" 136° 29'45"	Gawler Craton.
KERR McGEE A405/2		"	33° 34'25" 136° 29'45"	Gawler Craton.
KERR McGEE A405/3		"	33° 34'25" 136° 29'45"	Gawler Craton.
KERR McGEE A405/3A		"	"	Gawler Craton.
KERR McGEE A405/3B		"	"	Gawler Craton.

BORE / WELL	Date	Driller	Latitude Longitude	Geologic Area.
KERR McGEE L502/1		Kerr- McGee	33°37'20" 136°43'35"	Gawler Craton.
KERR McGEE L502/2		"	"	Gawler Craton.
KERR McGEE L505/1		"	33°35'35" 136°47'20"	Gawler Craton.
KERR McGEE L505/2		"	"	Gawler Craton.
KYCHERING WELL		E&WS	30°48' 134°26'	Gawler Craton.
LAMBINA NO. 1	1970	D.M.	27°31'00" 134°17'08"	Arckaringa Sub- Basin.
LAKE FROME NO. 1			31°03'24.5" 139°51'54"	Frome Embayment.
LAKE FROME NO. 2			31°02'54.5" 139°47'44.5"	" "
LAKE FROME NO. 3			31°04'30" 139°37'20"	" "
LAKE PHILLIPSON BORE	1905	E&WS	29°30' 134°37'	Lake Phillipson Trough.
LOXTON NO. 1		A.O. Corp.	34°34' 140°03'	Murray Basin.
MALBOOMA COAL BORE NO. 1		D.M.	30°40' 134°11' approx.	Gawler Craton.
MALBOOMA COAL BORE NO. 3		"	" "	Gawler Craton.
MALBOOMA COAL BORE NO. 5		"	" "	Gawler Craton.
MALLABIE NO. 1		Outback Oil	31°32'14" 130°36'06"	Eucla Basin Mallabie Depression.
MUNYARAI NO. 1	1969	Contin. Oil	27°41'53" 132°00'03"	Officer Basin.
MARALINGA BORE 5 48/54		LRWE	29°57'15" 131°39'15"	Maralinga.
MARALINGA BORE 7 168/55		LRWE	30°10'00" 131°36'10"	Maralinga.

BORE / WELL	Date	Driller	Latitude Longitude	Geologic Area.
MARALINGA BORE 8A 356/60		LRWE	30°08'20" 131°35'30"	Maralinga.
MARALINGA BORE 11B 192/56; 174/55		LRWE	30°09'10" 131°37'00"	Maralinga.
MARALINGA BORE 12 432/55		LRWE	30°11'15" 131°37'45"	Maralinga.
MARLA BORE		E&WS	27°14' 133°36'	East Officer Basin?
MT. CHRISTIE CD1		D.M.	30°18'30" 133°30'30"	Gawler Craton.
MT. CHRISTIE CD2		D.M.	30°18'30" 133°30'30"	Gawler Craton.
MT. CHRISTIE CD5		D.M.	30°19'12" 133°32'48"	Gawler Craton.
MT. CRISPE NO. 1			26°26'43" 135°22'36"	Pedirka Basin
MT. FURNER NO. 1	1970	D.M.	28°06'15" 134°28'10"	Arckaringa Sub-Basin.
MT. WILLOUGHBY NO.1	1970	D.M.	27°39'46" 134°16'39"	Arckaringa Sub-Basin.
MT. WOOD NO. 1	1966	Delhi	29°37'30" 135°27'30"	Mt. Woods Inlier
MT. WOOD NO. 2	1966	Delhi	" "	Mt. Woods Inlier.
MT. WOOD NO. 3	1966	Delhi	" "	Mt. Woods Inlier.
MT. WOOD NO. 4	1966	Delhi	" "	Mt. Woods Inlier.
MT. WOOD NO. 5	1966	Delhi	" "	Mt. Woods Inlier.
MT. WOOD NO. 6	1966	Delhi	" "	Mt. Woods Inlier.
MT. WOOD NO. 7	1966	Delhi	" "	Mt. Woods Inlier.
NAPPACOONGEE No. 1	1966	Santos	28°01'56" 140°44'44"	Cooper Basin.

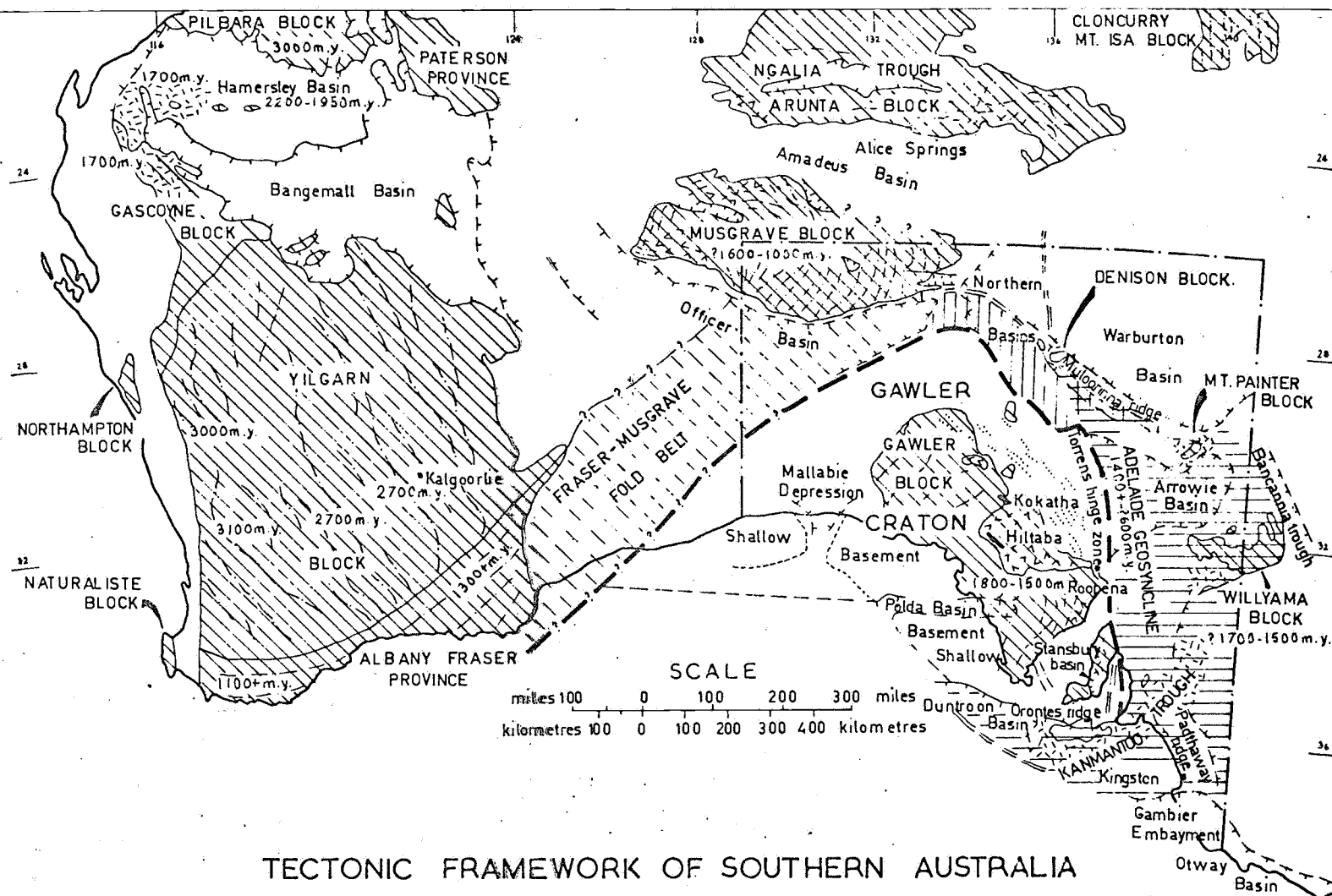
BORE / WELL	Date	Driller	Latitude Longitude	Geologic Area.
NULLARBOR PLAINS NO. 2			31°17' 130°37'	Eucla Basin Mallabie Depression.
NULLARBOR PLAINS NO. 5			30°10' 130°56'	Eucla Basin.
NULLARBOR PLAINS NO. 6			31°09' 131°12'	Eucla Basin Mallabie Depression.
NULLARBOR PLAINS NO. 7			31°01' 131°35'	Eucla Basin/ Gawler Craton.
NULLARBOR PLAINS NO. 8 (Yangoonabbie Bore)			31°27' 130°06'	Eucla Basin Mallabie Depression.
OFFICER NO. 1				Officer Basin.
OODNADATTA NO. 1		Santos	27°26' 135°21'	Great Artesian Basin.
PANDIEBURRA NO. 1	1963	Delhi- Santos	26°45'34.5" 139°29'03.1"	Great Artesian Basin.
POONORUNNA NO. 1		French Pet.	27°54'20" 137°54'50"	Great Artesian Basin.
PORT VINCENT NO. 1		Beach Pet.		St. Vincent Gulf.
PURNIE NO. 1	1964	French Pet.	26°17'10" 136°05'35"	Pedirka Basin.
PUTAMURDIE NO. 1	1963	Delhi- Santos	26°16'31" 139°46'35"	Great Artesian Basin.
RENMARK (NORTH) NO. 1	1963	A.O. Corp.	34°07' 140°41'	Murray Basin.
ROBERTSON NO. 1		Alliance Oil	37°11'45" 140°46'47"	Otway Basin.
ROOPENA STAT. HOLE NO. 1		D.M.	32°42'54" 137°24'24"	Gawler Craton.
SLEAFORD NO. 4	1964	Pendrill Ltd.	34°50'46" 135°44'33"	Gawler Craton.
SPENCER NO. 1	1966	Delhi	28°10'11" 139°52'02"	Cooper Basin.

BORE / WELL	Date	Driller	Latitude Longitude	Geologic Area.
STANSBURY TOWN NO. 1	1967	Beach Pet.	34°54'24" 137°46'46"	St. Vincent Gulf/ Yorke Pen.
STANSBURY WEST NO. 1	1966		34°54'02" 137°42'46"	"
STUART RANGE NO. 2	1920	D.M.	28°51' 134°54'	Stuart Shelf.
TARCOOLA TD 4		D.M.	30°42'10" 134°32'20"	Gawler Craton.
TARCOOLA NO. 5		D.M.	30°42' 134°33'	Gawler Craton.
TARCOOLA TD 1		D.M.	30°42'10" 134°32'20"	Gawler Craton
TARCOOLA TD 2		D.M.	30°42'10" 134°32'20"	Gawler Craton
TARCOOLA TD 4		D.M.	30°42'10" 134°32'20"	Gawler Craton.
TINGA TINGANA NO. 1	1967	Delhi	29°00'45" 140°05'38"	Cooper Basin.
WALLIRA NO. 1	1970	D.M.	29°27'03" 134°04'31"	Arckaringa Sub-Basin.
WALLIRA NO. 2	1970	D.M.	29°20'26" 133°49'42"	Arckaringa Sub-Basin.
WITCHERIE WELL	1964	French Pet.	26°22'20" 135°39'10"	Pedirka Basin.
WOOMERA BORE	1958	Clarence R. Basin Oil		Stuart Shelf.

FIGURE

**SOUTH
AUSTRALIA
GEOLOGY**

IS MISSING



TECTONIC FRAMEWORK OF SOUTHERN AUSTRALIA

REFERENCE

LATE CARPENTARIAN GRANITE.....

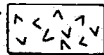


Post basin metamorphism or granite intrusion.....

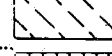


Sedimentary basin limits or hinge line.....

CARPENTARIAN VOLCANICS (dominantly acid).....



Fraser-Musgrave Basement Folding.....



Basement ridge.....

Marinoan-Cambrian Folding.....



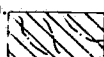
Linear magnetic anomalies (basic dykes?).....

Cambro-Ordovician Folding.....

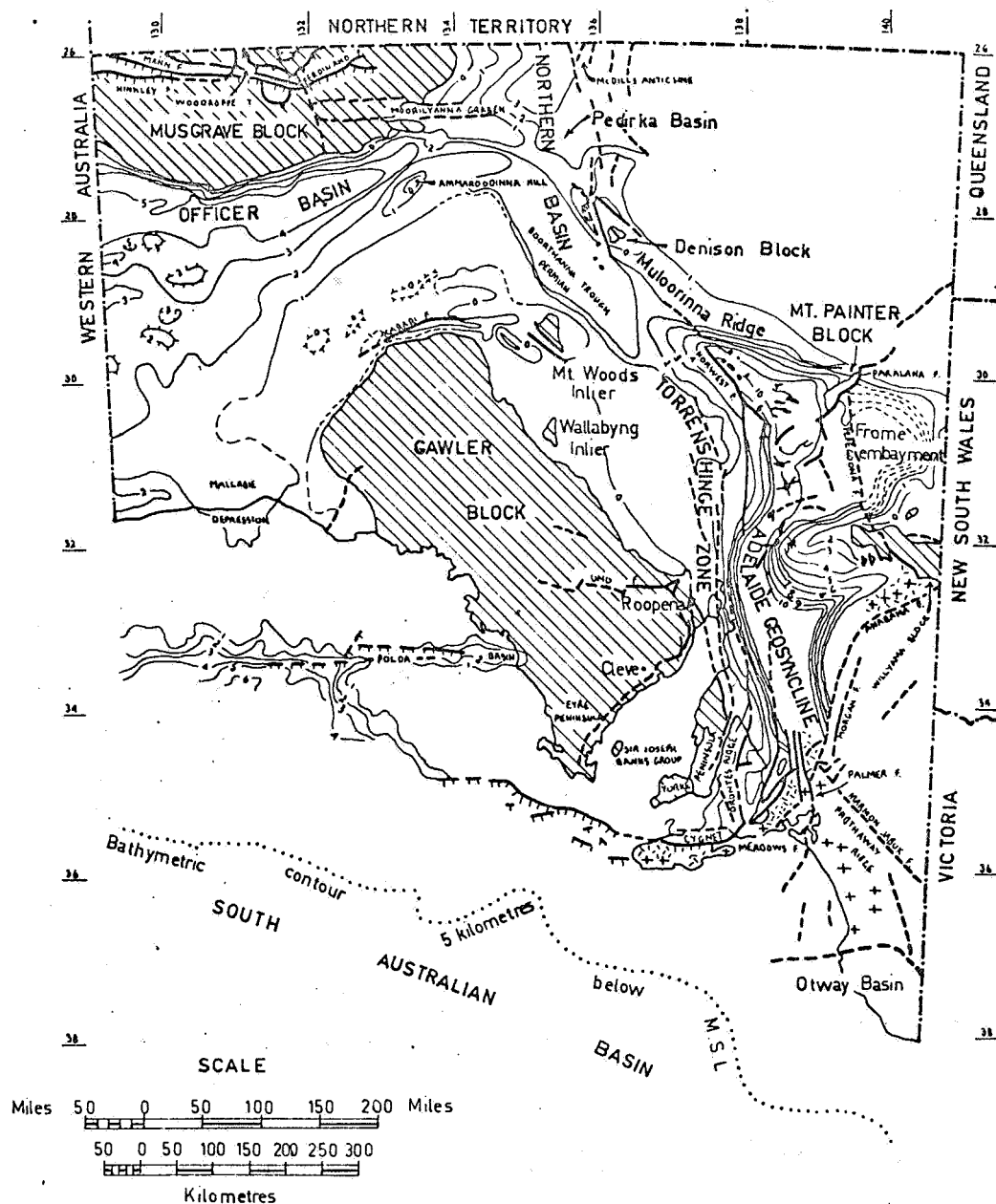


South Australian State Border.....

Structural trends in Undifferentiated Precambrian Crystalline Basement. Isotopic age, millions of years.



AFTER THOMPSON 1970



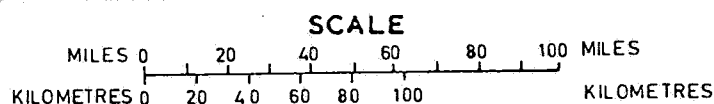
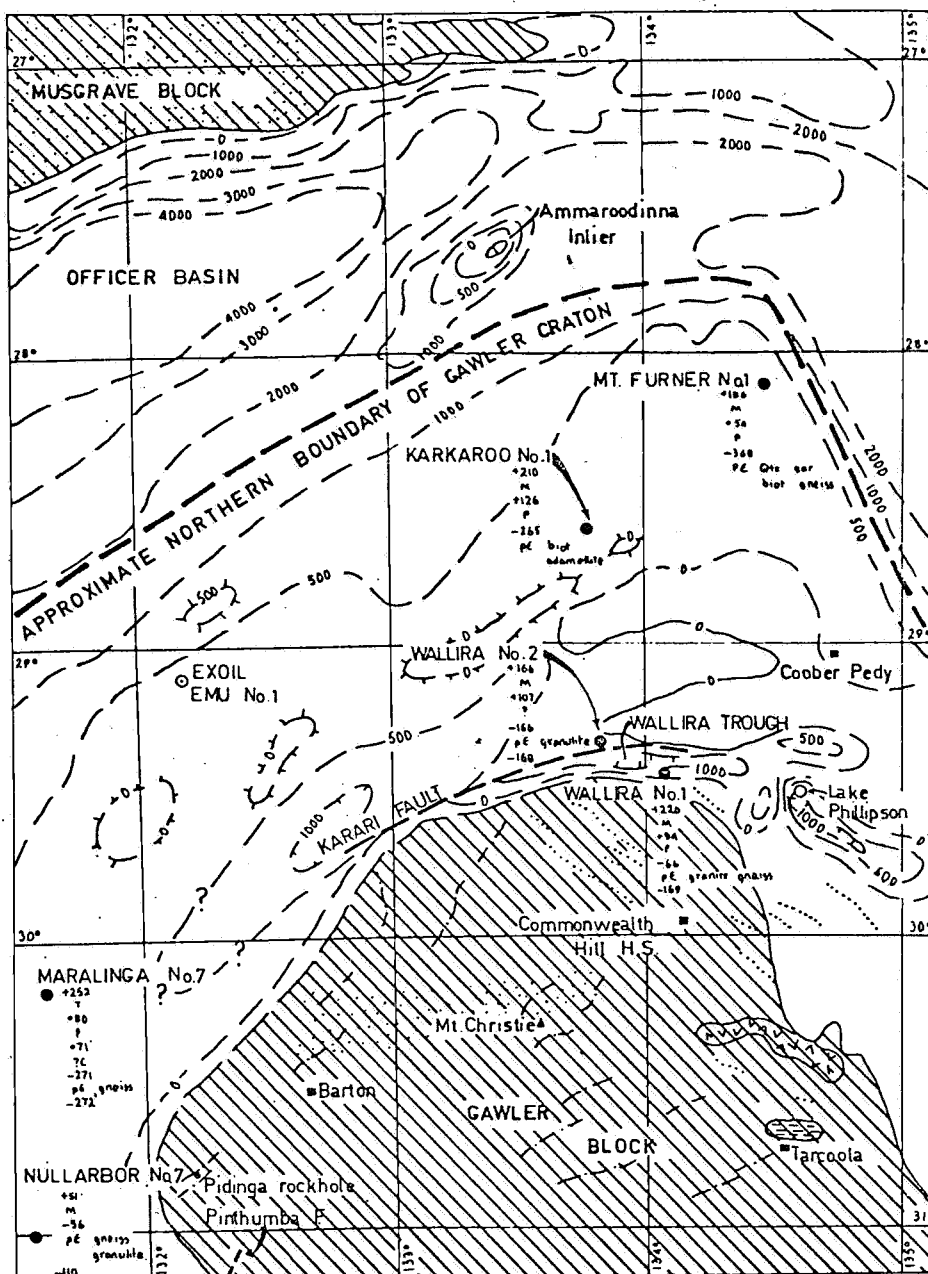
REFERENCE

- Basement contour in km. below M.S.L. ————
- FAULTS: observed
inferred
Palaeozoic metamorphism
Palaeozoic granite + + + +
Precambrian crystalline basement

Precambrian Basement Contours, Form Lines and other structural features in South Australia.

AFTER THOMPSON 1970

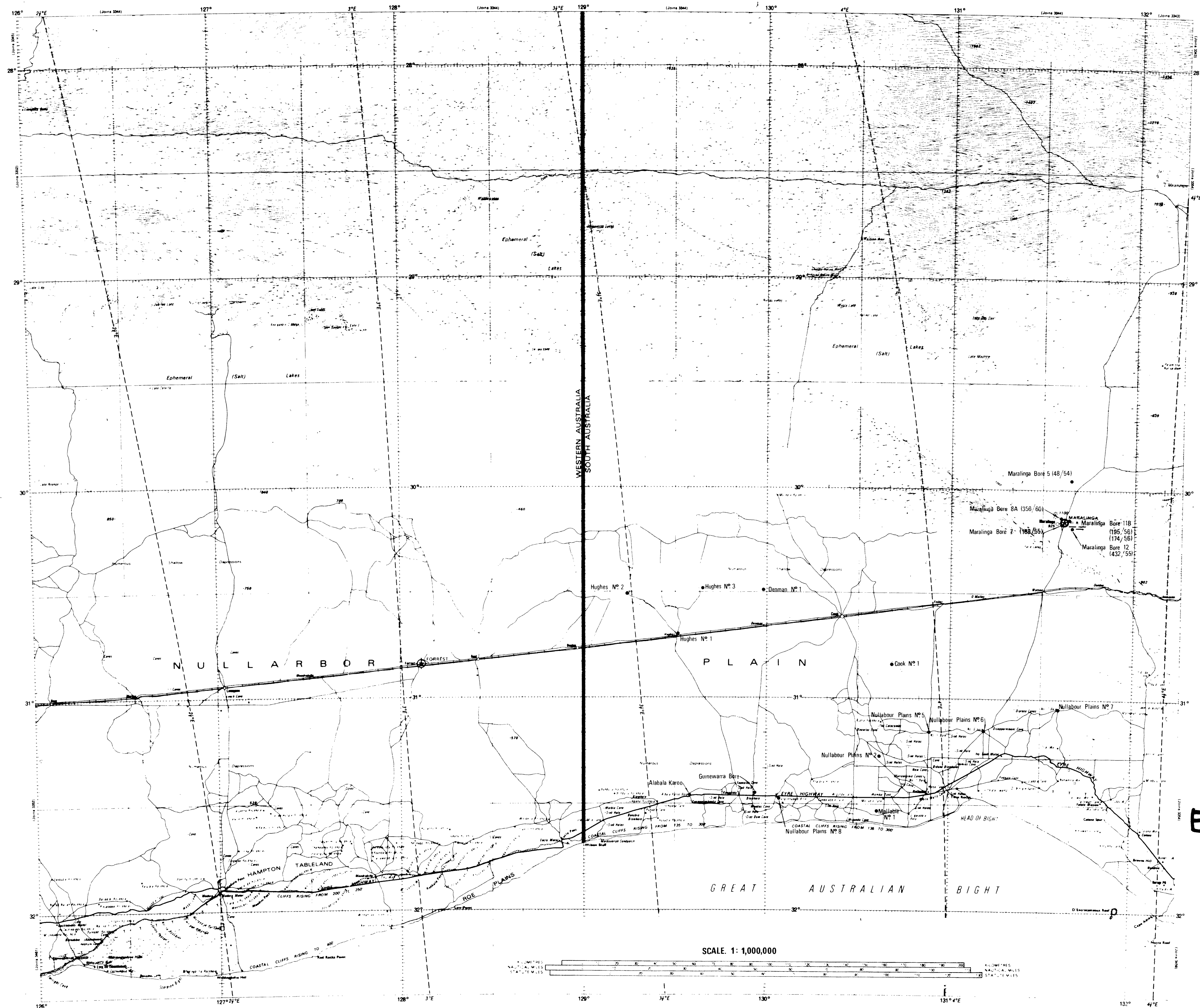
SOUTH AUSTRALIA STRUCTURE



LEGEND

- | | | | |
|---|--|--------------------------------------|---|
| Gawler Range Volcanics..... | | Basement contours, metres ref. —500— | Bores to basement depth in metres ref. M.S.L. ● |
| Tarcoola Beds..... | | Basement formlines, metres ref. —0— | Linear magnetic anomalies |
| Precambrian Basement with foliation trends..... | | | |
| Granulite Facies..... | | | |
- T (Tertiary), M (Mesozoic), P (Palaeozoic), C (Cambrian), pE (Precambrian)

BASEMENT STRUCTURES; NORTHERN GAWLER CRATON



TOPOGRAPHIC BASE
RELIABILITY DIAGRAM

- A. Compiled from accurate topographic maps and surveys
- B. Compiled from other available topographic information (Liable to vertical error)
- C. Compiled from sketches, reconnaissance, etc.

Lambert Conformal Conic Projection
Standard Parallels 28°40' and 31°20'

ENV 1880 (1) -1



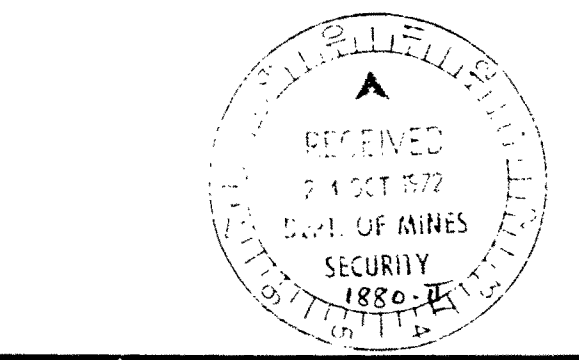
ASARCO (AUSTRALIA) PTY. LTD.

SH 52
BORE LOCATION

CHART SBW DATE Feb '72 488



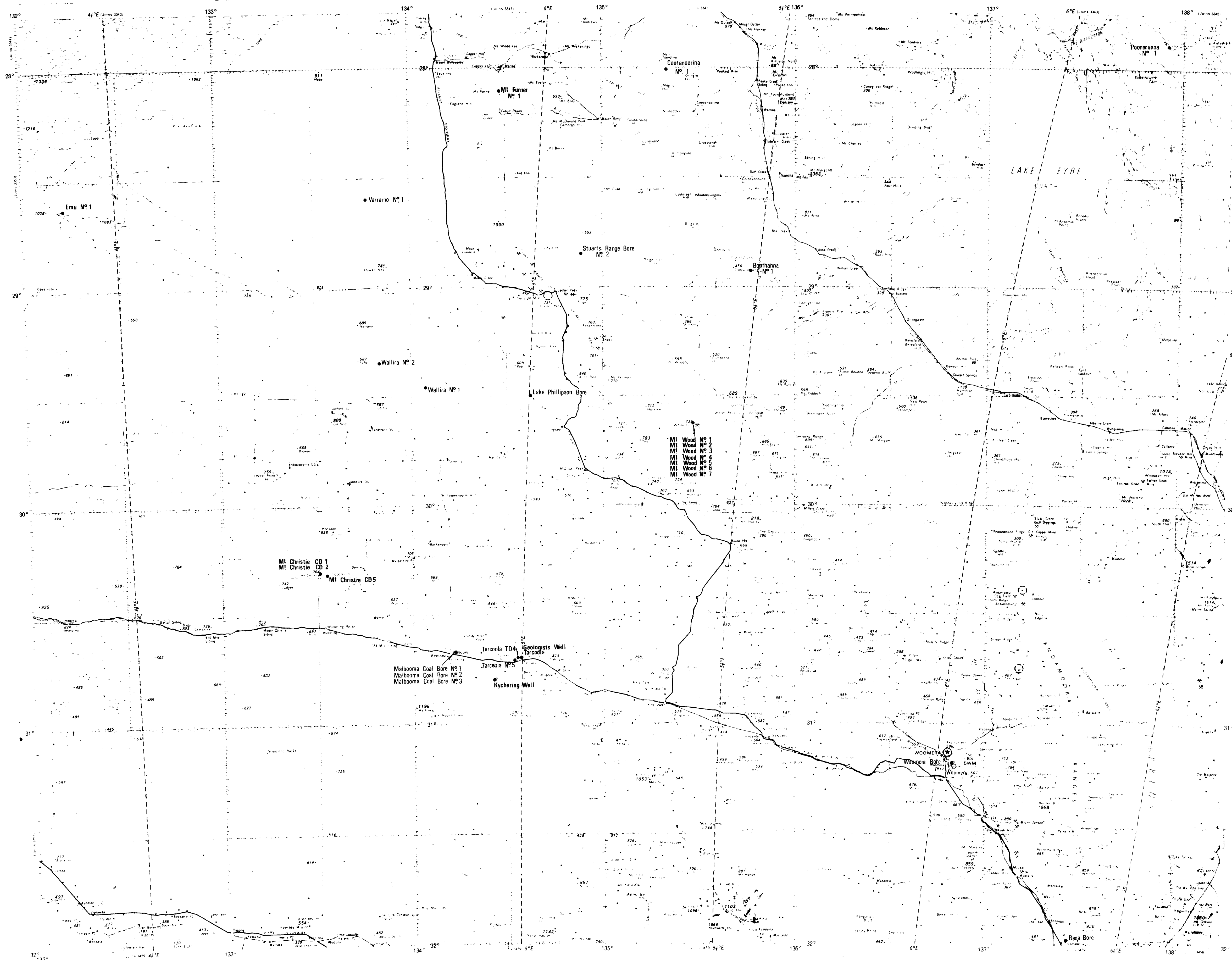
ENV 1880(1)-2



ASARCO (AUSTRALIA) PTY. LTD.

SI 53
BORE LOCATIONS

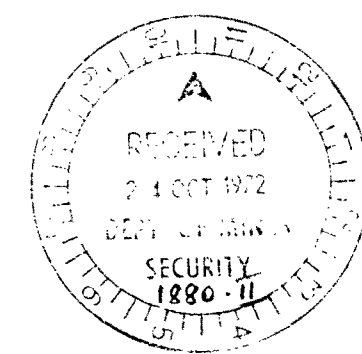
COMPILED SBW	CHECKED	PLAN NO.
DRAFTED	DATE Feb. 72	485



TOPOGRAPHIC BASE
RELIABILITY DIAGRAM

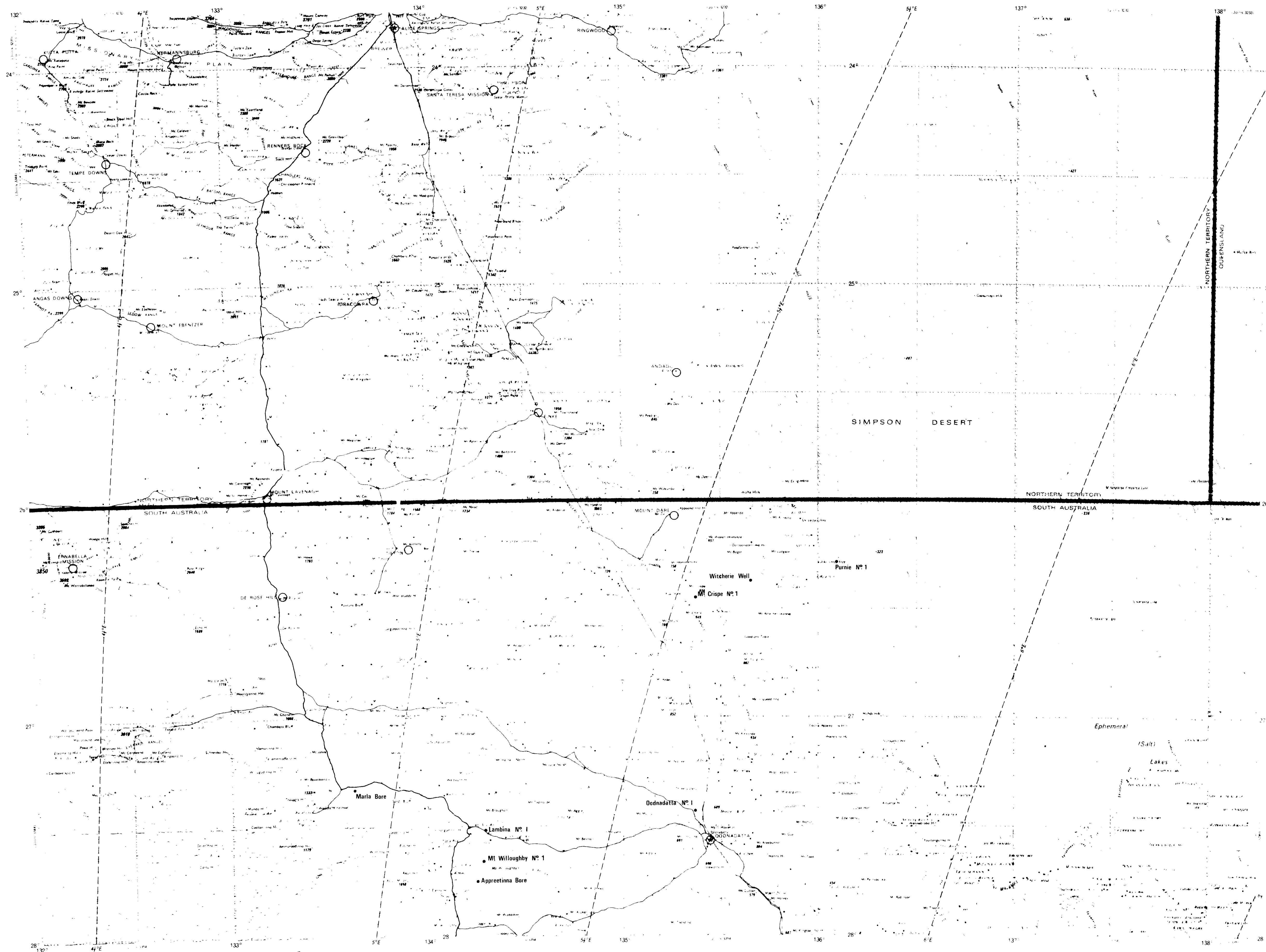
A. THE BASE MAP IS A
TOPOGRAPHIC MAP OF
AUSTRALIA
B. THE BASE MAP IS A
TOPOGRAPHIC MAP OF
AUSTRALIA
C. THE BASE MAP IS A
TOPOGRAPHIC MAP OF
AUSTRALIA

ENV 1880(1)-3

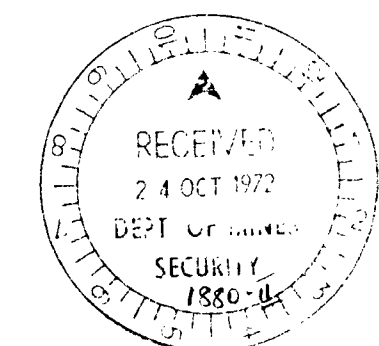


ASARCO (AUSTRALIA) PTY. LTD.

SH 53
BORE LOCATIONS

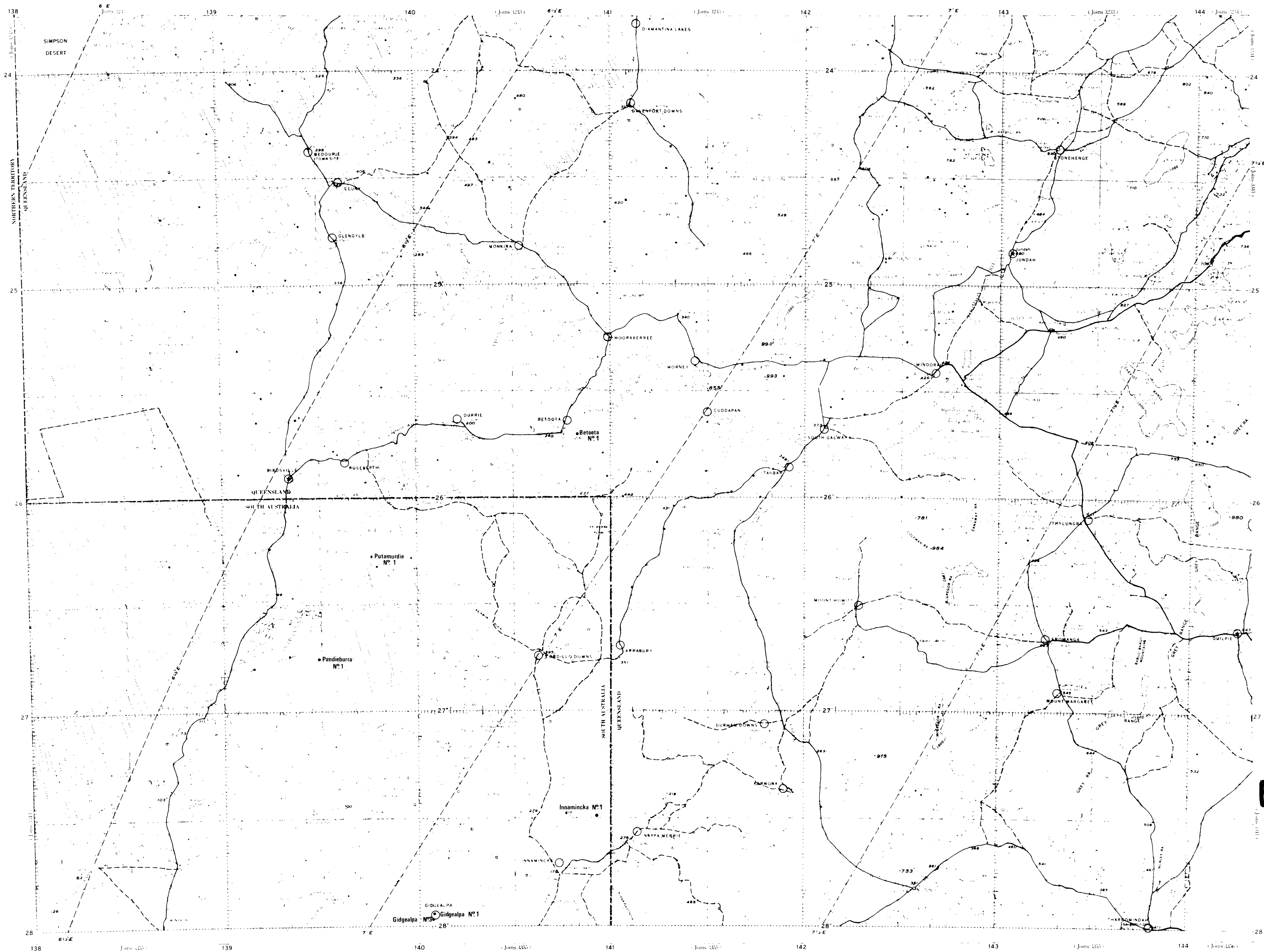


ENV 1880 (S) - 4



ASARCO (AUSTRALIA) PTY. LTD.

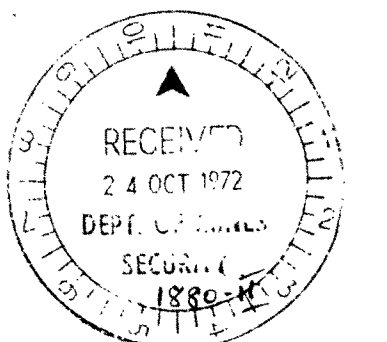
SG 53
BORE LOCATIONS



TOPOGRAPHIC BASE
RELIABILITY DIAGRAM

- B
- A RELIABLE
 - B FAIR
 - C POOR

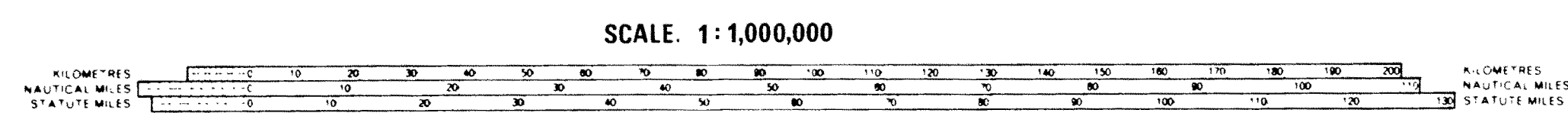
ENV 1880(1)-5



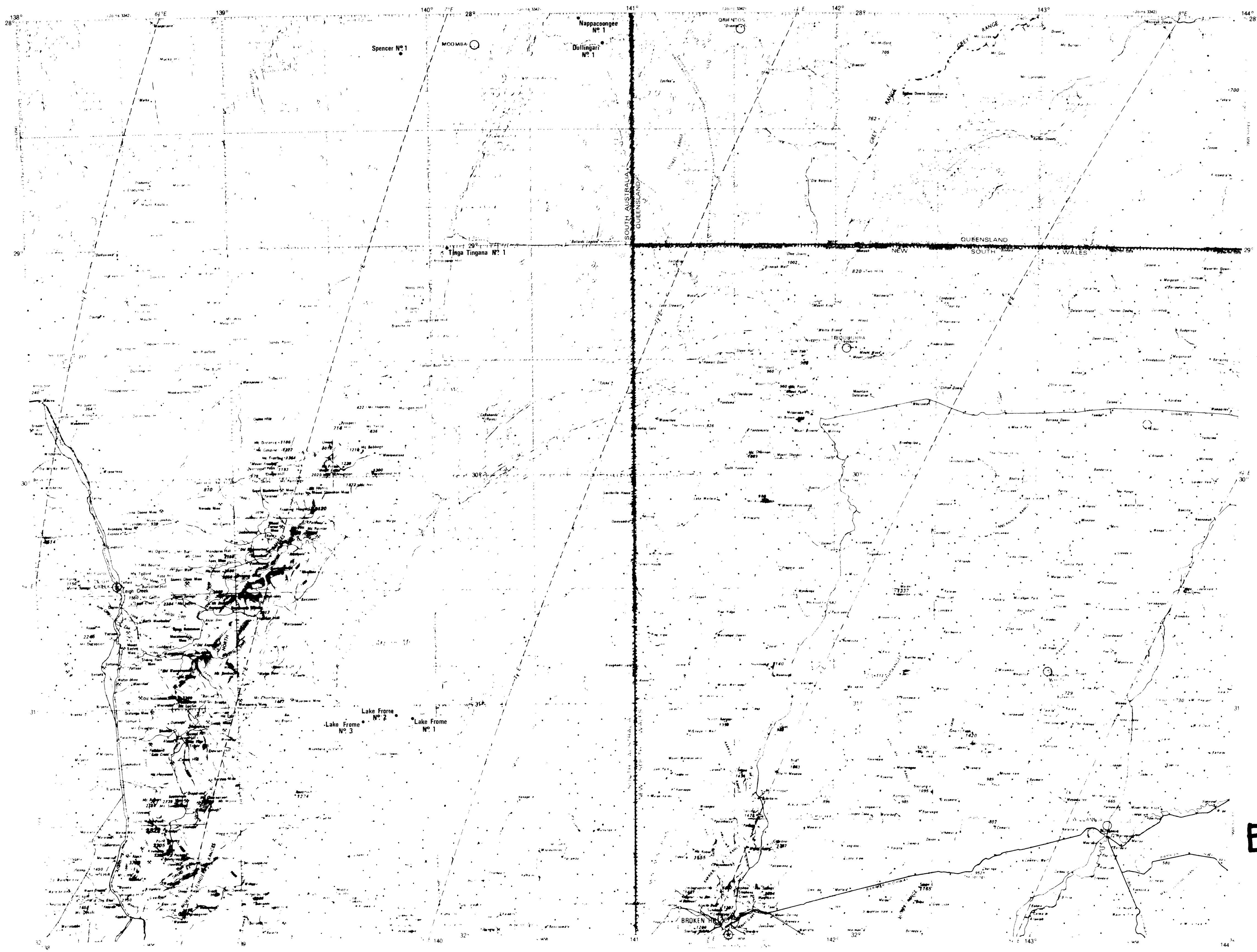
ASARCO (AUSTRALIA) PTY. LTD.

SG 54
BORE LOCATIONS

COMPILED SBW DRAFTED DATE Feb. 72 PLAN NO 483



Lambert Conformal Conic Projection
Standard Parallels 24°40' and 27°20'



TOPOGRAPHIC BASE
REL. ABILITY DIAGRAM

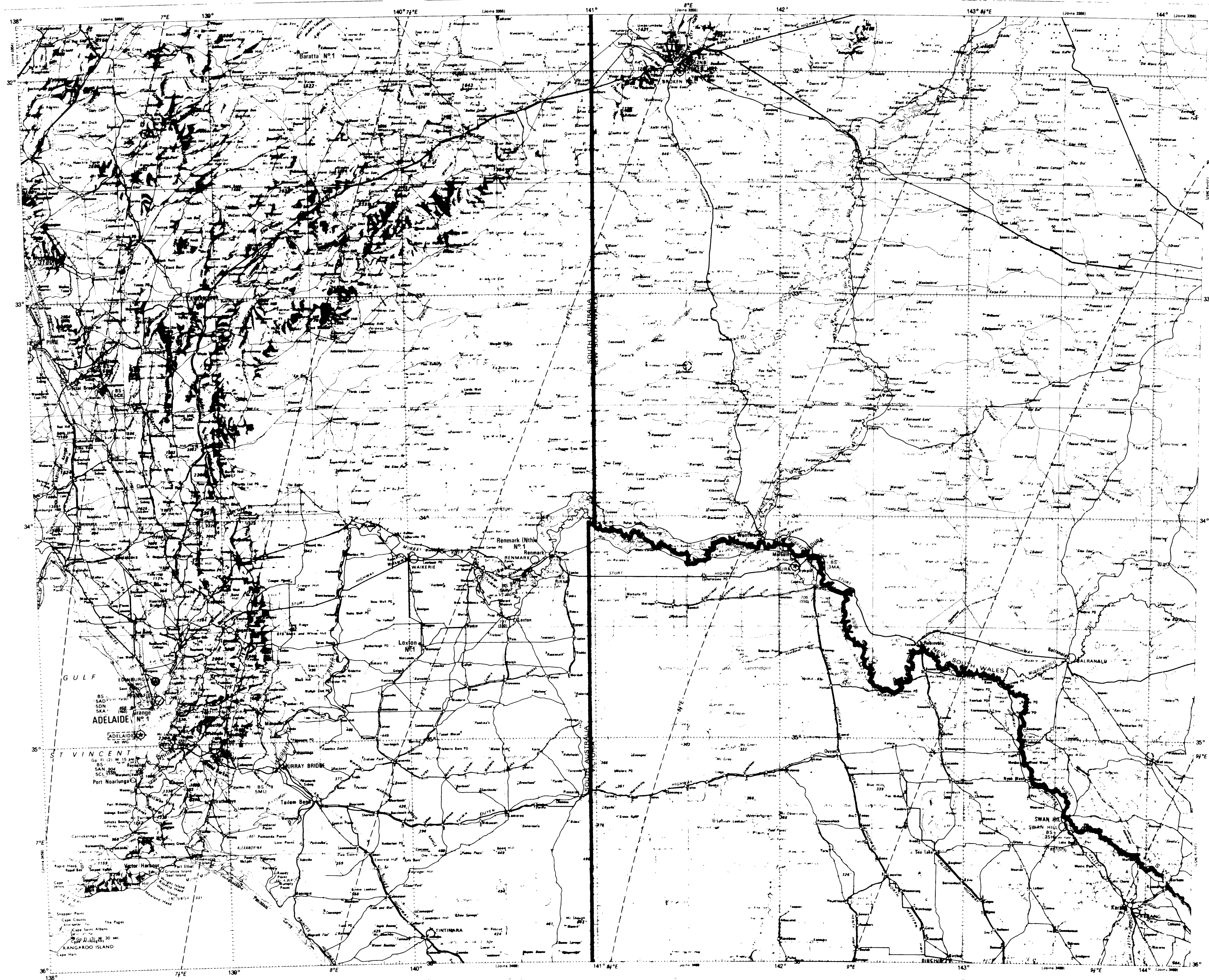
ASARCO (AUSTRALIA) PTY. LTD.
RECEIVED
24 OCT 1972
DEPT. OF MINES
SECURITY
1880-1

ENV 1880(1)-6

SCALE: 1:1,000,000

Lambert Conformal Conic Projection
Standard Parallel 26° 41' 30" S

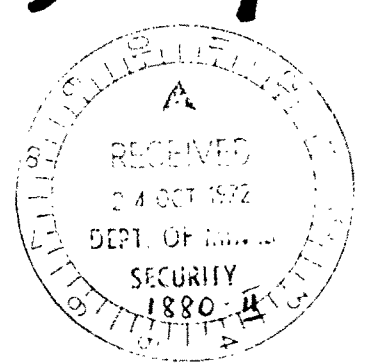
ASARCO (AUSTRALIA) PTY. LTD.	
SH 54 BORE LOCATIONS	
DATE Feb. 72	484



TOPOGRAPHIC BASE
RELIABILITY DIAGRAM

- A. Compiled from accurate topographic maps and surveys
- B. Compiled from other available topographic information. Subject to vertical error
- C. Compiled from sketches, reconnaissance, etc.

ENV 1880(1)-7

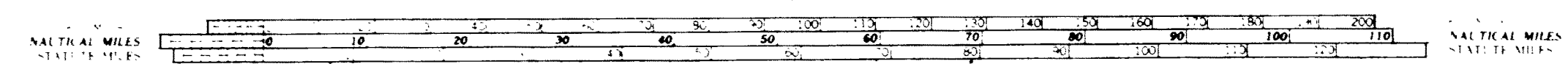


ASARCO (AUSTRALIA) PTY. LTD.

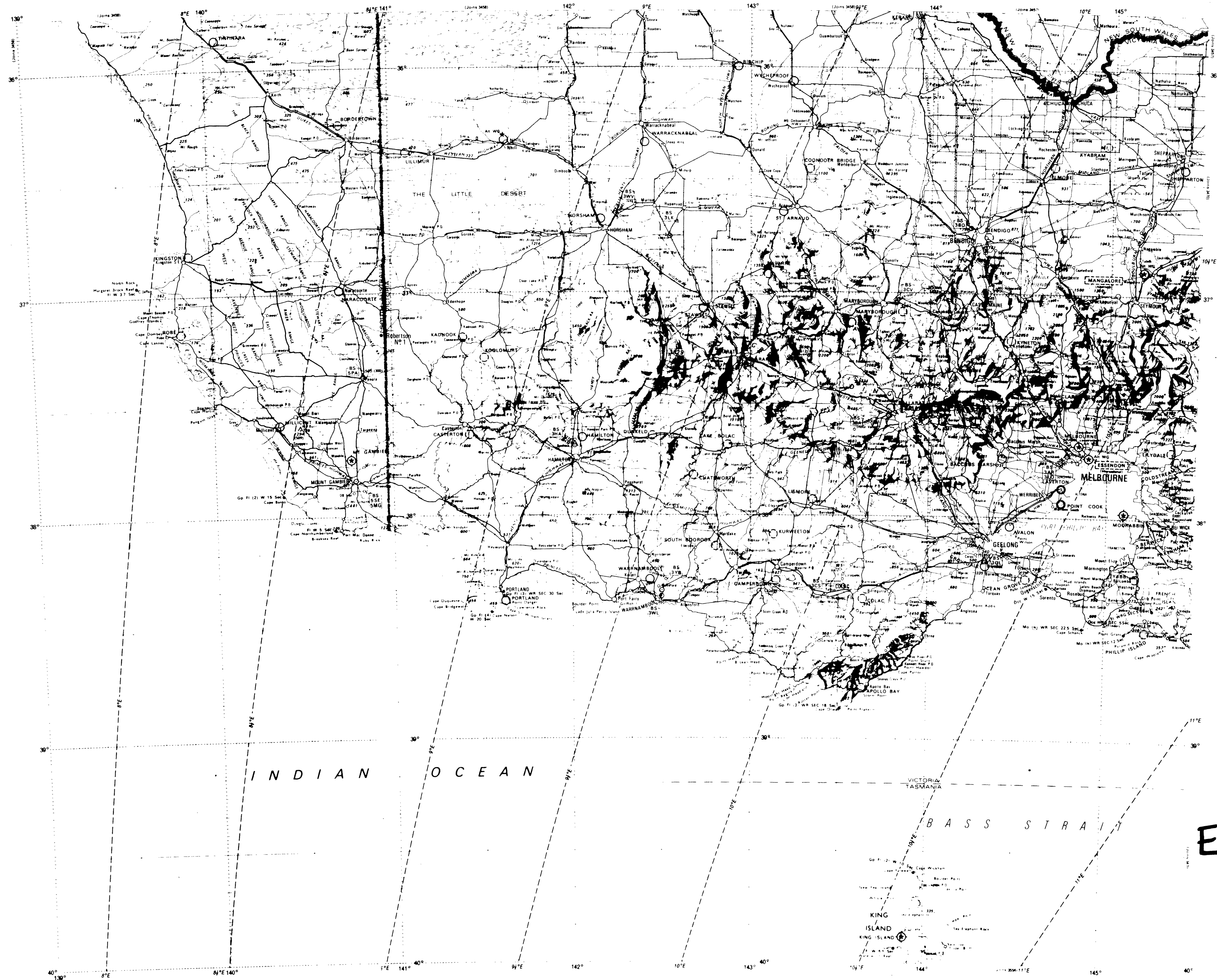
SI 54
BORE LOCATIONS

COMPILED SBW	CHECKED	PLAN NO
DRAFTED	LATE Feb. 72	490

SCALE: 1:1,000,000



Lambert Conformal Conic Projection
Standard Parallels 32°40' and 35°20'

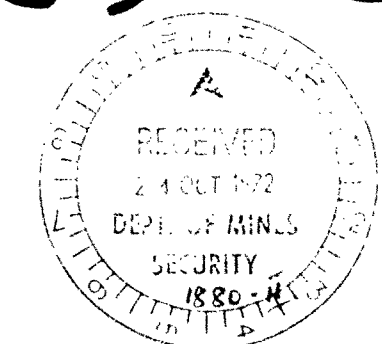


TOPOGRAPHIC BASE
RELIABILITY DIAGRAM

A
B
A

A. Compiled from accurate
topographic maps and
surveys.
B. Compiled from other
available topographic
information. liable to
vertical error.
C. Compiled from sketches
reconnaissance, etc.

ENV 1880 (1)-8



ASARCO (AUSTRALIA) PTY. LTD.

SI 55

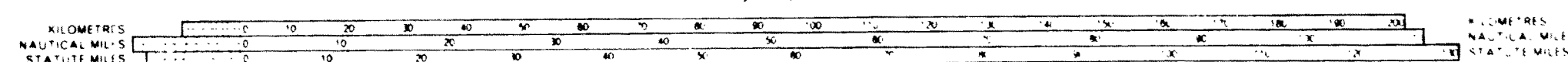
BORE LOCATION

COMPILED SBW

DATE Feb 72

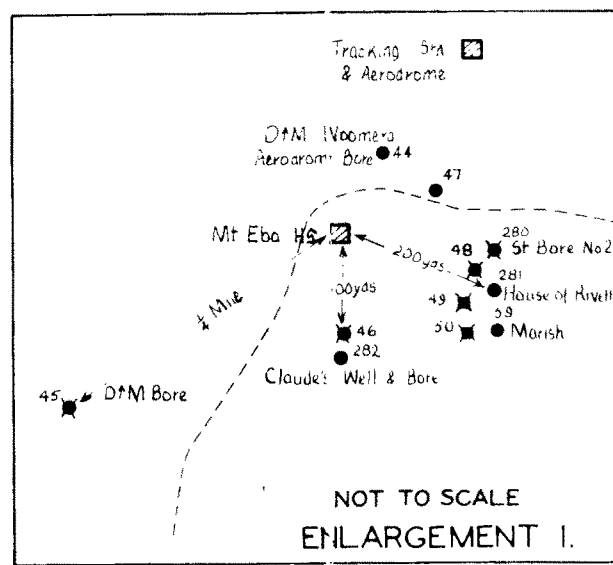
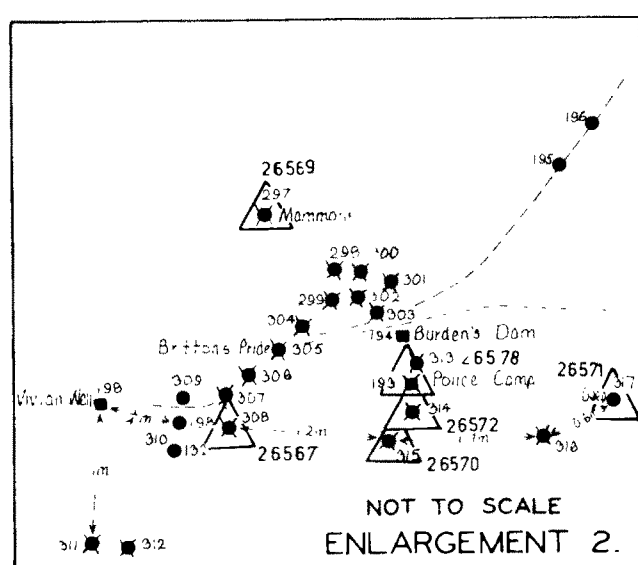
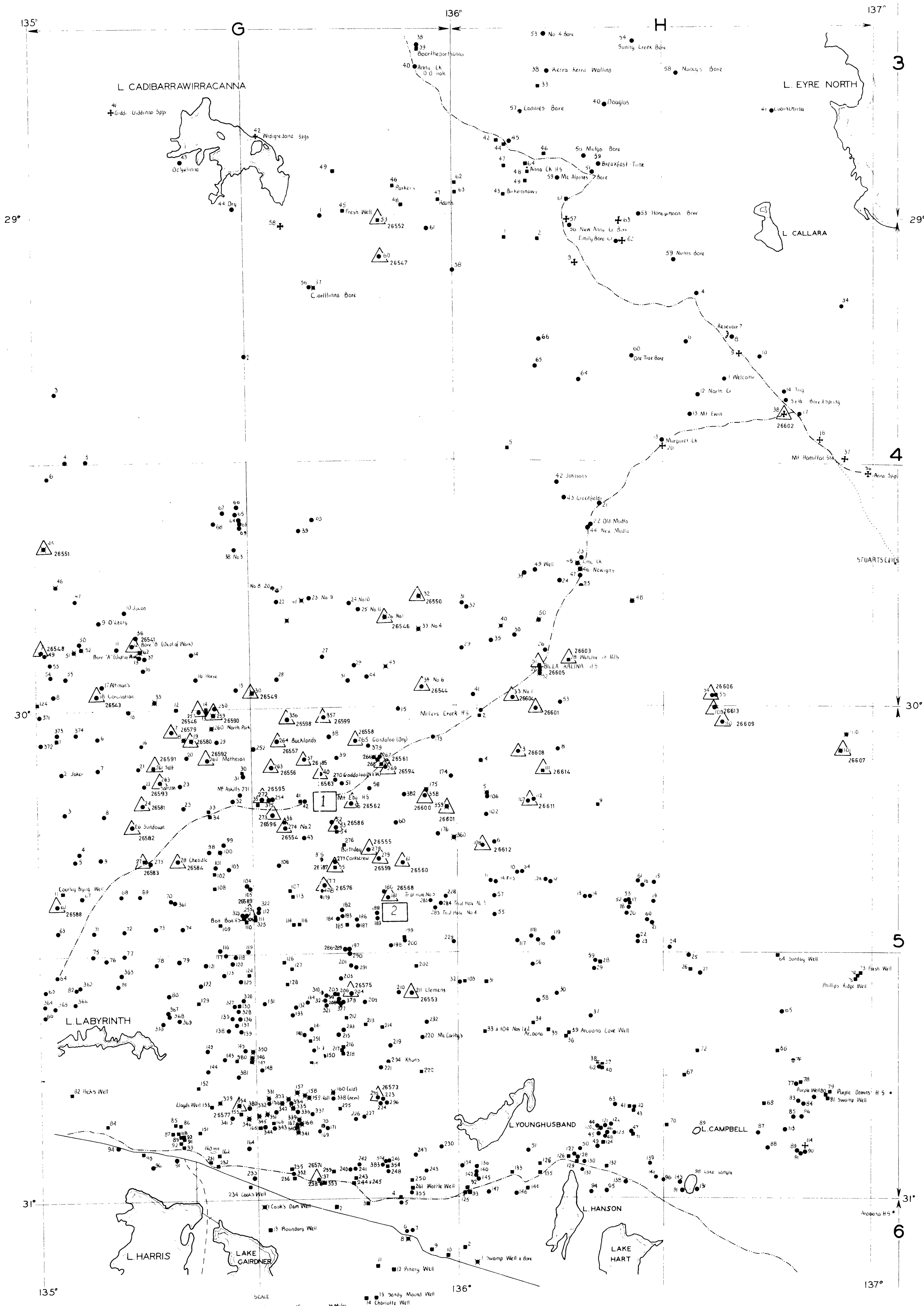
489

SCALE 1:1,000,000



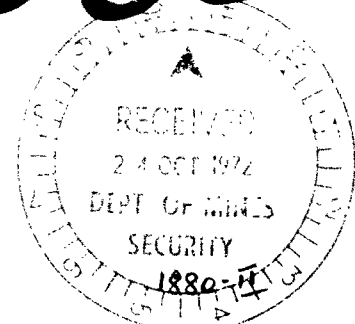
Lambert Conformal Conic Projection
Standard Parallels 36°40' and 39°20'

PASTORAL PLAN SHEET Nº 13.



26576. BOREHOLE LOCATIONS WITH SAMPLE NUMBERS

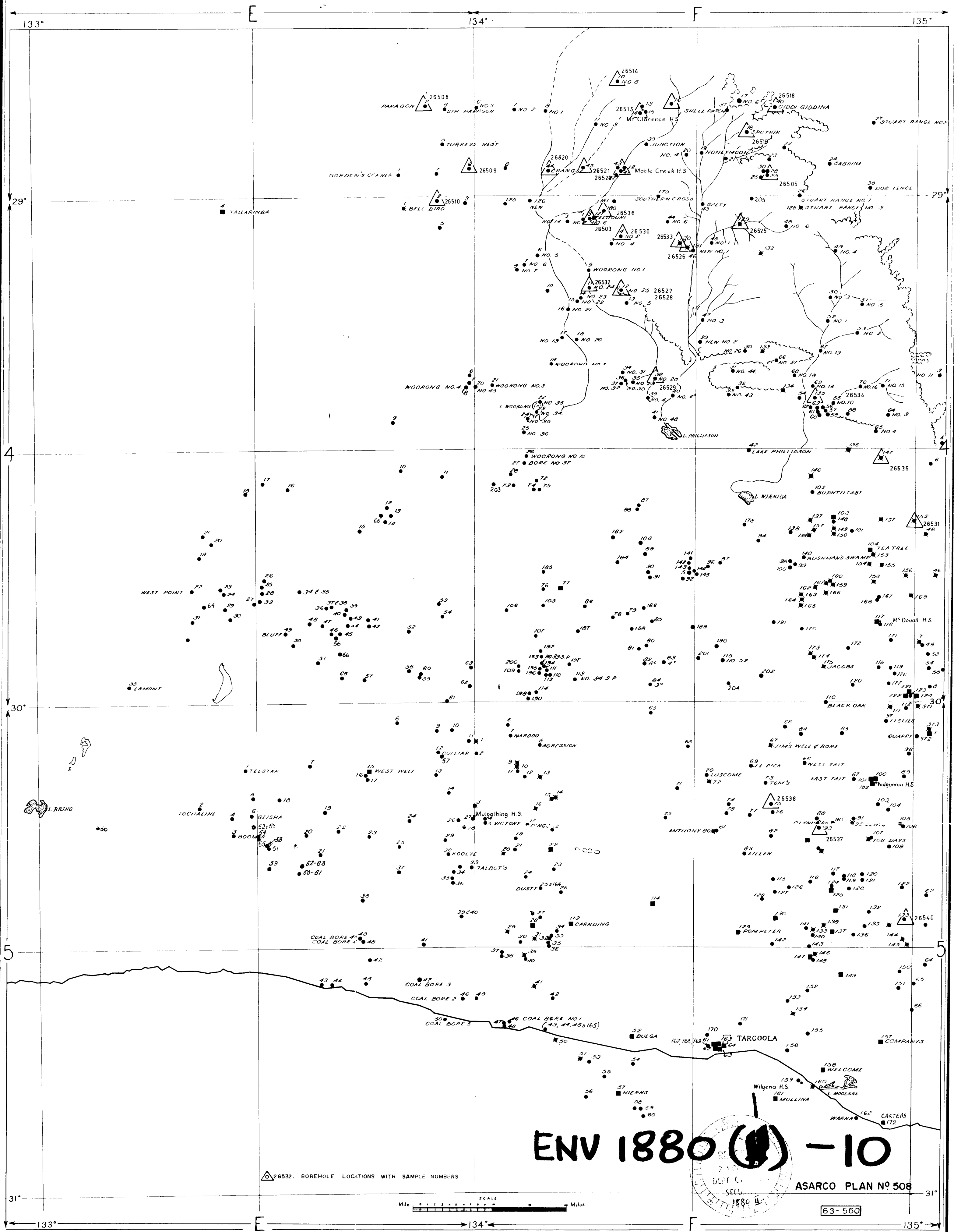
ENV 1880 (1)-9



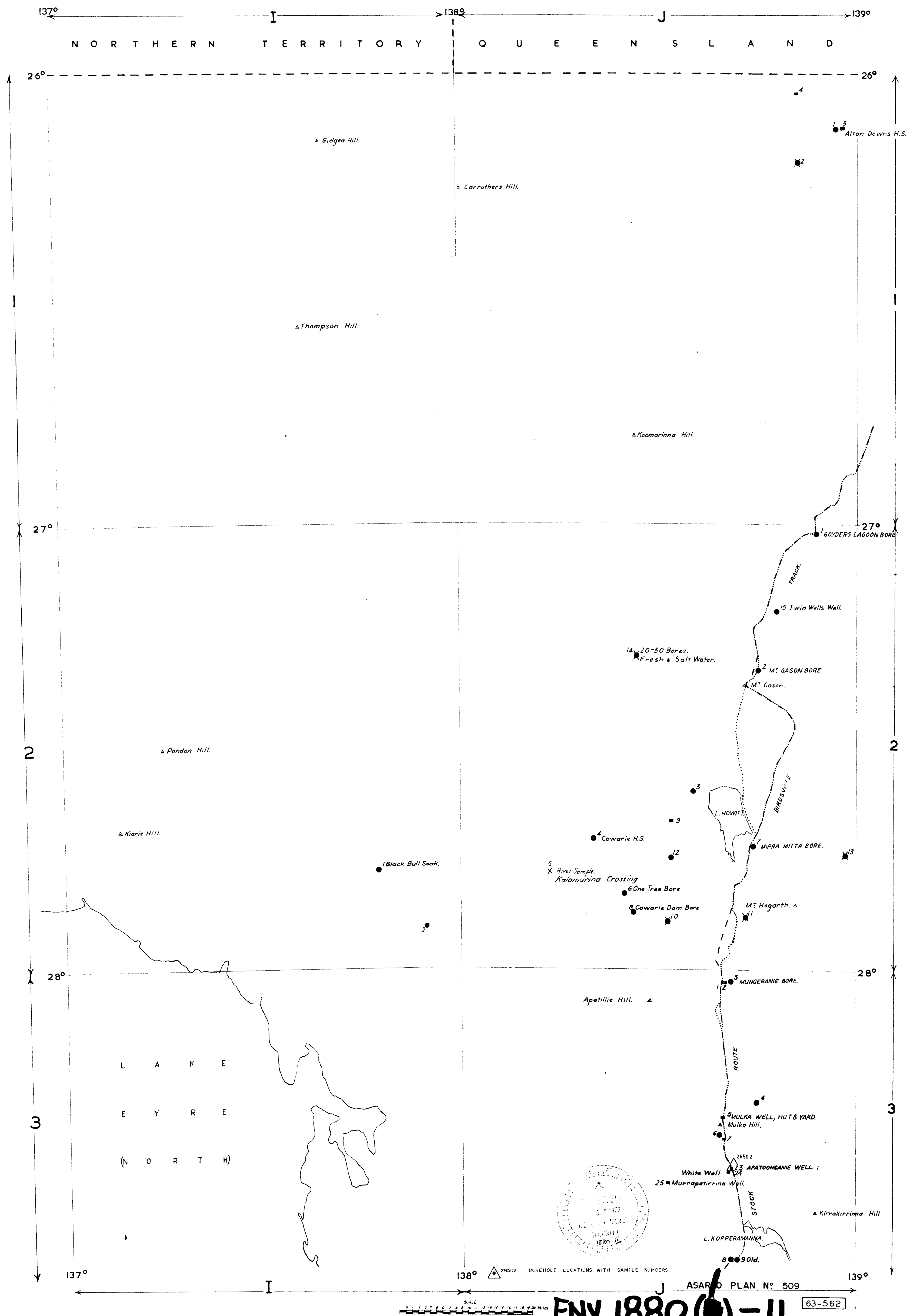
ASARCO PLAN Nº 507

63-565

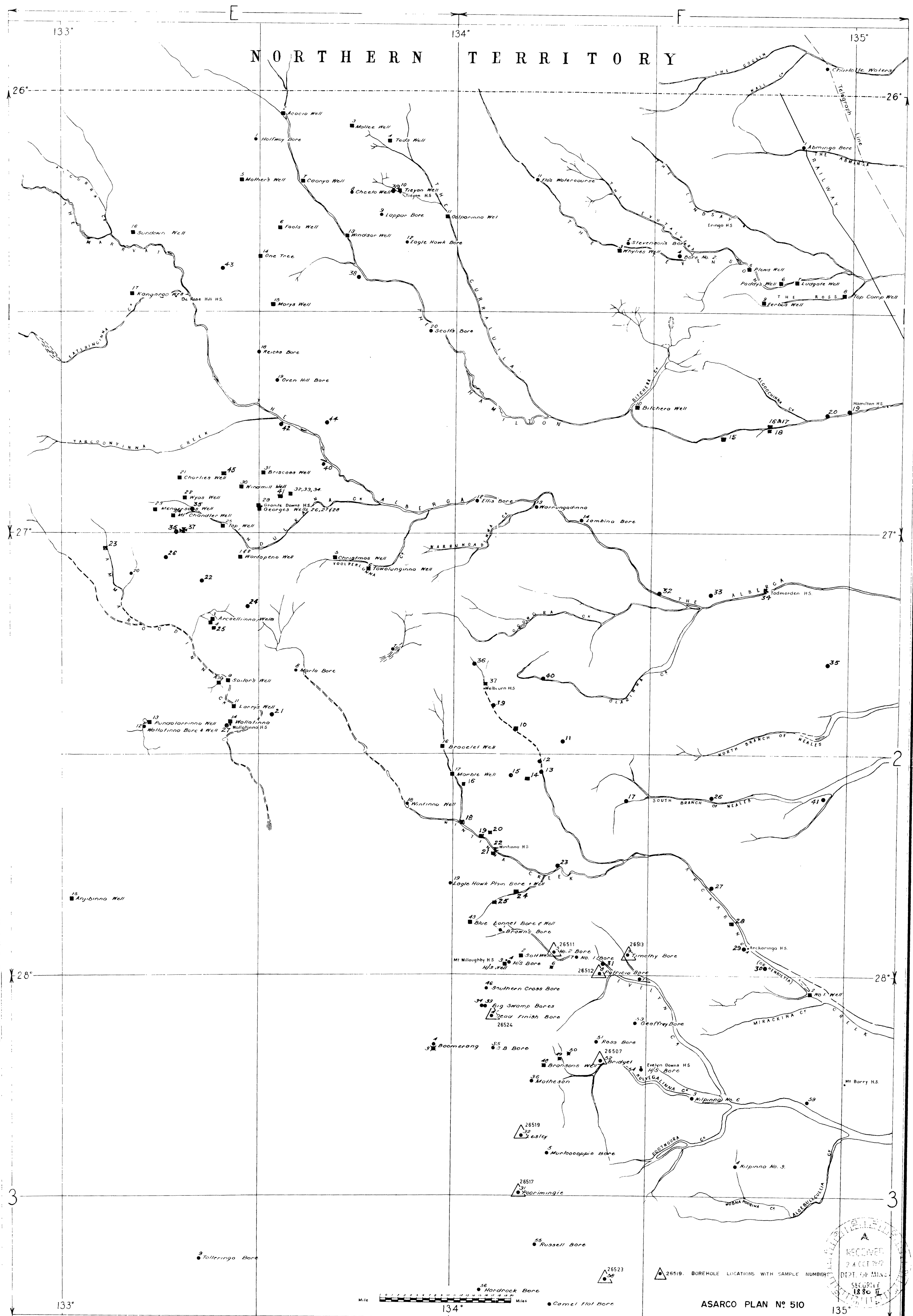
PASTORAL PLAN SHEET N° 14.



PASTORAL PLAN SHEET Nº 16



PASTORAL PLAN SHEET N^o 18.



ASARCO PLAN Nº 510

RECEIVED
24 OCT 1962
DEPT. OF MINE
SECURITY
1880 II

ENV 1880 (2) - 12

BORE-SAMPLE ANALYSES SOUTH AUSTRALIA
APPENDIX 1
SAMPLE CONTAMINATION

REPORT ON CONTAMINATION OF SAMPLES

used in

ASARCO (AUSTRALIA) PTY. LTD. BORE SURVEY,

1971 - 1972.

By

OVERLAND ENTERPRISE PTY. LTD.

Feb. 1972.

INTRODUCTION.

The survey of approximately one hundred stratigraphic bores in a limited time period necessitated the use of samples subject to contamination. Bore cores were sampled using an electric powered cutting wheel set in a convenient frame while the formations of many deep bores, particularly those completed pertinent to oil search, were sampled using ditch cuttings, as only restricted footages of core material or no cores at all were available. In the case of bore core sampling, the induced contaminant factors were realised from the outset of the survey while the contaminations present in ditch cuttings were varied, unpredictable in occurrence and were derived from several sources prior to storage in the Mines. Dept. core library.

This report briefly describes the degree and extent of the contamination encountered in the survey.

CONTAMINATION OF CORE SAMPLES.

The cutting mechanism used to sample bore core has been described in an earlier report.

The hand-held mechanism first used (a cutting-off wheel attachment to a Sher portable electric drill) contributed contamination only in the form of particles from the cutting wheel. Atomic absorption assays of the cutting wheel indicated the following gross metal contents in part per million.

Cu	Pb	Zn	Ni	Co	Mn	Cr
15	5	30	80	5	50	860

In rock of extreme hardness the volume of cutting wheel contamination was small. Counts of fragments in a sample taken from a massive quartzite indicated a contamination volume of 2%-4%.

This sample gave the following assay :

Cu	Pb	Zn	Ni	Co	Mn
-5	5	10	-	-	15

The later use of the same cutting-off wheel mounted on a shaft driven by an electric motor, increased zinc contamination due to the use of a galvanised iron guard around the blade to act as a safety device, and to deflect the sample onto a collecting tray. To determine the extent of contamination, quartz was sampled for a protracted period, firstly under normal conditions and secondly attempting to induce contamination by forcing the wheel to come in contact with the guard. The following results were obtained :

	Cu	Pb	Zn	Co	Ni	Mn
Quartz	-5	-5	-5	-5	-5	15
Sample 1	5	5	210	-5	30	10
Sample 2	5	5	310	5	15	90

CONTAMINATION OF CORE SAMPLES (Cont.)

The results showed that under extreme conditions 200-300+ p.p.m. Zn could be contributed to samples from hard rocks but other metal values were not adversely affected. Softer rocks placed no great strain on the cutting mechanism and the amount of contamination was therefore considerably less.

Overall the method used to sample core was considered satisfactory, and zinc contamination, below values of general interest, did not adversely affect the assessment of assay results.

The zinc contamination of the mechanism used could be readily removed by the use of a wooden or plastic guard surrounding the cutting blade.

TABLE 1

Bore (footage).	Paint			Fibres		Rusty Steel	Other
	Red	Yellow	Blue	Green	Wood	Jute	
Lake Frome 1 (1270'-1290')	-	tr.	-	-	-	-	tr. pyrite, tr. arsenopyrite tr. metallic zinc globules.
Lake Frome 1 (2110'-2130')	tr.	-	-	-	10%	-	tr. grey metallic zinc coating on some grains.
Lake Frome 2 (1470'-1490')	-	-	-	tr.	-	-	tr. metallic zinc.
Lake Frome 2 (1850'-1870')	tr.	-	-	tr.	minor	-	tr. zinc globules form grey coat- ing on some grains (1-2%).
Lake Frome 2 (2270'-2290')	tr.	tr.	-	tr.	tr. (cane?)-	-	tr. metallic zinc.
Lake Frome 3 (1240'-1260')	tr.	tr.	-	important (10%)	-	-	tr. Black bitumen specks (-2%) Metallic zinc -1%.
Lake Frome 3 (1320'-1340')	-	Important (15-20%)	tr.	tr.	minor	-	tr. yellow and red paints adhere to each other. Metallic zinc -1%.

TABLE 1 (Cont.)

tr. = trace. Yellow paint is probably zinc chromate anticorrosive undercoat paint.

Other colours (blue, green) probably contain copper and chromium elements.

Metallic grey zinc globules (as grey sludge or grains) have probably been produced by reduction of a zinc-based paint.

Rusty metal is part of the drilling equipment.

Individual globules of zinc have grains sizes of less than five microns.

CONTAMINANTS OF CUTTING SAMPLES.

Considerable difficulties occur in assessing metal values in assays from cutting samples. A number of contaminants, the quantities and varieties of which vary from bore to bore and in different sections of the same bore, give rise to marked anomalies. The most widespread contaminant is paint in the form of flakes of different colour (white, red, blue, green, yellow) and also as very fine zinc globules present as decomposition products surrounding sample grains.

By far the most intense contamination was found in ditch cuttings from bores Lake Frome 1, Lake Frome 2 and Lake Frome 3. Zinc values of over 1%, and high lead values were found to be due to red, blue, yellow and green paint flakes and zinc globules derived from paint breakdown. Other contaminants were wood fibres, bitumen and steel fragments. A summary of investigations carried out on these holes by I.F. Scott, Central Mineralogical Services (Report 72/1/4 of 5th Jan. '72) is given in Table 1.

Follow-up investigations on cuttings from bores in the Eucla Basin-Maralinga area also showed that paint was a widespread contaminant but to a far lesser degree and dominantly white in colour. Some examinations of more recent wells drilled for oil companies did not disclose any contaminants reflecting greater care in collecting the samples (e.g. Gidgealpa No.3).

The origin of the contaminants in various bores is conjectural. It was noted that the majority of cuttings displaying contamination came from bores where the water supply for drilling purposes was restricted and had to be carted considerable distances (this was the case for the Lake Frome bores). Dirty water tanks, recirculating water, painting machinery during the drilling programme, poor sample collection practices and working on contaminated surfaces when dividing samples for filing are all possible contributing factors to the contaminations observed.

CONTAMINANTS OF CUTTING SAMPLES (Cont.)

Cutting assays therefore require to be treated with caution. Anomalous values need to be investigated to determine whether they are due to contaminants, sulphide or other inherent mineral contents.

Table 2 lists the bores assayed and indicates the extent of contamination present, so far as is known.

The following legend is used to define the reliability of the assay samples for each bore :-

1. Core samples - reliable assays.
2. Bore fragment samples from discontinuous and irregular intervals - reliable individual assays which may not reflect the average metal content of the formations cut.
3. Cuttings samples - assay values useful in assessing base metal contents of strata.
4. Cuttings samples - assay values or microscopy indicating partial significant contamination. Anomalous assays require individual appraisal.
5. Cutting samples - widespread contamination; even with the aid of microscopy the metal content of strata remains indeterminate.
6. Cutting samples - no information available on contamination, Microscopy required.
7. Well and Bore Spoil Samples - useful in assessing base metal contents in an area; no known significant contamination.

TABLE 2.

Bore	Sample	Reliability	Contaminants
ALABALAKAROO	Frag.	2	
APPREETINA BORE	Frag.	2	
BARATTA NO. 1.	Core	1	
BEDA BORE	Frag.	2	
BETOOTA NO. 1.	Cut.	3	Not investigated
BIRKSGATE NO. 1.	Cut.	4	Possible contamination indicated by assays.
	Core	1	
BLACK POINT NO. 1.	Cut.	3	Not investigated.
BOORTHANNA NO. 1.	Cut.	3	Not investigated.
BUTE NO. 5.	Core	1	
COOK NO. 1.	Cut.	3,4	White paint(tr.), zinc globules.
COOTANORINA NO. 1.	Cut.	3(4)	Possible partial contamination indicated by assays.
D. KER SAMPLES	Spoil	7	Not investigated.
DENMAN NO. 1.	Cut.	3	No apparent contaminants.
DULLINGARI NO. 1.	Cut.	3	Not investigated.
EDITHBURGH NO. 1.	Cut.	3	
EMU NO. 1.	Core	1	Not investigated. Some
	Cut.	4	contamination possible.
EMU FLAT BORE 1.	Cut.	3	
GEOLOGIST WELL	Frag.	2	
GIDGEALPA NO. 1.	Cut.	3	
GIDGEALPA NO. 3.	Cut.	3	
"	Core	1	
GRANGE NO. 1.	Cut.	3	
GUINEWARRA BORE	Frag.	2	
HUGHES NO. 1.	Cut.	3	No apparent contaminants.
HUGHES NW NO. 2.	Cut.	3	
	Core.	1	
HUGHES NE NO. 3.	Cut.	3	
INNAMINCKA NO. 1.	Cut.	3	Not investigated.
KARKAROO NO. 1	Cut.	3	

TABLE 2 (Cont.)

Bore	Sample	Reliability	Contaminants
KERR McGEE BORES	Core	1	
KYCHERING WELL	Frag.	2	
LAMBINA NO. 1.	Core	1	
LAKE FROME NO. 1.	Cut.	5	Paint, wood fibre, zinc globules.
	Core	1	
LAKE FROME NO. 2.	Cut.	5	Paint, wood fibre, rust, zinc globules.
	Core	1	
LAKE FROME NO. 3.	Cut.	5	Paint, wood fibre, rust, zinc globules.
	Core	1	
LAKE PHILLIPSON	Frag.	2	
LOXTON NO. 1.	Cut.	3(4)	
MALBOOMA NOS. 1-3	Cut.	2	
MALLABIE NO. 1.	Cut.	3	
	Core	1	
MUNYARAI NO. 1.	Cut.	4	
	Core	1	
MARALINGA 5, 7, 8A, 11B, 12	Cut.	3	
MARLA BORE	Frag.	2	
MT. CHRISTIE 1, 2, 5	Core	1	
MT. CRISPE NO. 1.	Cut.	4(6)	
MT. FURNER NO. 1.	Core	1	
MT. WILLOUGHBY NO. 1.	Core	1	
MT. WOOD 1-7	Core	1	
NAPPACOONGEE NO. 1.	Core	1	
NULLARBOR PLAINS NOS. 2, 5, 6, 7, 8	Frag. and Cut.	2 3(4)	Zn globules. Generally minor white paint, green paint.
OFFICER NO. 1.	Cut.	3	
	Core	1	
ODNADATTA NO. 1.	Cut.	3	
PANDIEBURRA NO. 1.	Cut.	4	Paint traces.
POONARUNNA NO. 1.	Cut.	4(6)	No correlation between core and cutting assays.
	Core	1	
PT. VINCENT. NO. 1.	-	-	Not assayed.
PURNI NO. 1.	Cut.	4	

TABLE 2 (Cont.)

Bore	Sample	Reliability	Contaminants
PUTAMURDIE NO. 1.	Core	1	Zn contamination
	Cut.	3	
RENMARK NORTH NO. 1.	Cut.	3	
ROBERTSON NO. 1.	Core	1	Minor contaminations indicated.
	Cut.	4	
ROOPENA NO. 1.	Core	1	
SLEAFORD NO. 1.	Cut.	3	
SPENCER NO. 1.	Cut.	3	
STANSBURY TOWN NO. 1.	CORE	1	
	Cut.	4(6)	
STANSBURY WEST NO. 1.	Cut.	3(4)	
STUART RANGE NO. 2.	Cut.	3	
TARCOOLA T.D.1-4	Core	1.	
TINGA TINGANA NO.1.	Core	1	
WALLIRA NO. 1.	Core	1	
WALLIRA NO. 2.	Core	1	
WITCHERIE NO. 1.	Cut.	3(6)	
WOOMERA BORE	Core	1	

MICROSCOPIC EXAMINATION OF CUTTINGS: EUCIA BASIN MARALINGA AREA

Page. 1

Assay no.	Bore name Interval	Assays (ppm)			Lithology	Sulphides		Paint		Zinc coating	Remarks
		Cu	Pb	Zn		%	type	%	colour		
21386	Alabala Karoo	10	130	45	Qtz and Carbonaceous material in dk gray sand. Magnetite. Chlorite present. Fossiliferous.	tr	pyritic quartzite	tr	white	—	—
	632 662										
21387	Alabala Karoo	25	10	120	Fine grained gray sand. Pyritic. Glauconite.	tr	pyrite	tr	white	rare metallic zinc globules	No ferrugination.
	662 790?										
21388	Alabala Karoo	15	10	590	Dark Pyritic Clay with Qtz and quartzite fragments.	tr	pyrite	tr	white (insignificant)	—	—
	790 860										
21389	Alabala Karoo	25	10	170	Dk sandy clay with Qtz and feldspar fragments. Pyritic accessories, glauconite, magnetite, bolite	tr	pyrite	tr	white	rare zinc coating on some grains	
	860 925										
22279	Cook No 1 Alabala Karoo	5	270	10,000	Qtz quartzite and limestone fragments in calcareous cement. Some green & opatite	tr	pyrite	—	—	~2% metallic zinc globules and small grains	goethite boxworks after pyrite
	520 540										
22280	Cook No. 1	15	110	430	Quartzite and limestone fragments, rare greens and rutile	tr	pyrite	—	—	aggregates and coatings of metallic zinc	poorly developed in goethite fragments. - boxworks after pyrite
	540 560										
22285	Cook No 1	15	180	310	Pyritic quartzite, Qtz and rare limestone fragments in poorly consolidated sand.	tr	pyrite	tr	white rust fragments	globular zinc coatings	As above.
	640 660										
22290	Cook No 1	10	390	440	Qtz fragments with Qtz, monzonite, rutile & other heavy minerals also quartzite frags clay and magnetite.	tr	pyrite (individual grains.)	tr	white rust fragments also	zinc coatings on some grains	As above.
	740 760										
22291	Cook No 1	10	640	550	Detrital Qtz grains, grains of feldspar, green shale, quartzite, also many heavy minerals (rutile, green etc)	tr	pyrite	tr	white	rare zinc globules on some grains	—
	760 780										

MICROSCOPIC EXAMINATION OF CUTTINGS: EUCLA BASIN-MARALINGA AREA

Page. 3

Assay no.	Bore name Interval	Assays (ppm)			Lithology	Sulphides		Paint		Zinc coating	Remarks
		Cu	Pb	Zn		%	type	%	colour		
22574	Hughes No 1 1260 1280	60	25	95	Fragments of micaceous green and purple shale. Some Feldspar fragments also.	tr	pyrite	—	—	—	No contamination.
21343	Malabar No 1 3250 3300	70	25	110	Iron rich basalt fragments (magnetic) with some red quartz. Feldspar porphyry. Rare quartz crystals.	tr	pyrite (in porphyry)	—	—	—	No contamination. Some goethite boxworks after pyrite.
21350	Malabar No 1 3600 3650	280	75	200	Magnetic vesicular green basalt fragments. Some gneissic grains. Pyritic porphyry.	tr	pyrite	—	—	Pest flakes.	—
21351	Malabar No 1 3650 3700	30	90	540	Mainly porphyry. Some green basalt fragments. Evidence of shearing.	tr	pyrite (very minor)	—	—	Some aggregates of zinc globules.	—
21353 21353	Malabar No 1 3750 3800	130	10	75	As above. mainly acid volcanics. Some crystalline translucent cement - may be varnish?	tr	pyrite	tr	varnish?	As above.	—
21354	Malabar No 1 3800 3850	20	130	230	Apparently rounded detrital quartz grains with fragments of quartz-feldspar (red), porphyry and basalt.	tr	pyrite (in porphyry)	—	—	zinc coatings on some quartz feldspar grains.	? contamination uphole
21359	Malabar No 1 4000 4050	40	50	310	As above	tr	pyrite	—	—	Some foreign grains. may be carbonate.	—
21364	Malabar No 1 4500 4600	210	20	55	Quartz. Feldspar and biotite grains (granitic gneiss). Rare porphyry. Some ferruginous material. Epidote is common.	tr	pyrite	—	—	—	goethite - no apparent boxworks.
21367	Malabar No 1 4800 4880	10	110	200	Similar to above. Some GYPSIFEROUS clay contamination.	tr	pyrite	—	—	—	goethite.

MICROSCOPIC EXAMINATION OF CUTTINGS: MUCLA BASIN-MARALINGA AREA

Page. 5

Assay no.	Bore name Interval	Assays (ppm)			Lithology	Sulphides		Paint		Zinc coating	Remarks
		Cu	Pb	Zn		%	type	%	colour		
22420	Maralinga 7 1690 1708	5	10	2000	Reddish Brown drilling mud with a few rounded quartz fragments.	—		—		—	—
22461	Maralinga 8A 507 530	15	20	360	Dominantly grey mud (drilling mud?) very few particles - non-magnetic.	—				Possible coatings on some larger grains	
22465	Maralinga 8A 584 600	15	15	200	Small subrounded quartz grains in even grained mass. Fine grained pink mud matrix. Traces of magnetite.	—				Very minor if any.	
22470	Maralinga 8A 720 750	5	5	720	Detrital quartz and rutile in matrix as above. Rare larger quartz grains.	—				—	
22477	Maralinga 8A 885 900	5	5	450	As above. non magnetic	—				traces only	green and white fibres.
22480	Maralinga 8A 940 960	5	5	720	Rounded quartz grains in drilling mud. Fibres common. Rare larger sandstone and carbonate fragments.	—				traces only	
22442	Maralinga 11B 423 469	<5	5	60	Fine grained aggregate of quartz grains with some carbonate, lignite, pyrite nodules, zircon.	<1%	pyrite	—		—	no apparent contamination
22450	Maralinga 11B 770 800	5	5	240	Quartz, limestone, and shale fragments in a drilling mud?	<1%	pyrite				As above. some graphite.
22453	Maralinga 11B 873 900	5	10	360	Mass of detrital grains including magnetite, rutile, rounded quartz, ilmenite and other heavy minerals. Matrix may be drilling mud.	tr	pyrite			rare coatings on some grains.	some ferruginous staining

MICROSCOPIC EXAMINATION OF CUTTINGS: EUCIA BASIN-MARALINGA AREA

Page. 4

Assay no.	Bore name Interval	Assays (ppm)			Lithology	Sulphides		Paint		Zinc coating	Remarks
		Cu	Pb	Zn		%	type	%	colour		
22383	Maralinga 7	75	45	170	Grey sand with fragments of dk mudstone and epidote. Magnetite is common.	?	Chalcopyrite	tr	green	—	Goethite with traces of sulphide in minute boxworks.
	580 620										
22384	Maralinga 7	25	140	170	Grey sand. with quartz and clay fragments. Rutile and magnetite common.	tr	pyrite	—	—	—	Small ferruginous grains.
	620 650										
22385	Maralinga 7	75	760	110	Sandy mudstone. many rounded quartz pebbles. Epidote and rutile, ? monazite accessories.	tr	pyrite	—	—	—	Some goethite with minute boxworks.
	650 668										
22387	Maralinga 7	15	10	590	Unconsolidated quartz and biotite fragments in gypsiferous clay. lignitic.	—	—	tr	white	Aggregates form grains. Some coatings on biotite fragments.	—
	740 820							rarely	green.		
22393	Maralinga 7	15	20	270	Small rounded quartz grains in iron rich clay. ? part of drill bit.	—	—	tr	green	—	Goethite. no apparent boxworks.
	940 980										
22410	Maralinga 7	10	25	3550	Magnetic mud. May be drilling mud with drill fragments.	—	—	—	—	—	—
	1503 1523										
22412	Maralinga 7	10	55	6450	Quartz fragments in drilling mud. Magnetite particles are common. Rutile & other heavy minerals are common.					No coating or aggregates. May be rare single zinc blebs.	Hgt zinc value not explained.
	1543 1563										
22415	Maralinga 7	10	15	3900	Quartz magnetite and accessories (rutile, ilmenite etc) in magnetic drilling mud.	rare	pyrite	—	—	As above	—
	1603 1623										
22418	Maralinga 7	5	20	1600	Reddish brown drilling mud with well rounded quartz and rutile grains. Very magnetic particles also common.					As above	Goethite after magnetite.
	1663 1690										

MICROSCOPIC EXAMINATION OF CUTTINGS: EUCLA BASIN-MARALINGA AREA

Page. 6

Assay no.	Bore name Interval	Assays (ppm)			Lithology	Sulphides		Paint		Zinc coating	Remarks
		Cu	Pb	Zn		%	type	%	colour		
22485	Maralinga 12	30	5	240	Drilling mud with fragments of kaolinitic. Some dark clay with seams of white.	tr	pyrite	—	—	—	—
	448 492										
22486	Maralinga 12	120	5	55	Fragments of shale and quartz feldspar with epidote, rutile and other detrital accessories.	<1%	pyrite				Some green mammillary mineral? malachite. also ferruginous staining.
	493 515										
22489	Maralinga 12	100	15	85	Rounded detrital quartz with larger shale fragments. Epidote is common. magnetite.	tr	pyrite assoc with magnetite	—	—	—	—
	547 570										
22497	Maralinga 12	5	5	220	Fine grained evenly sorted sand with heavy mineral accessories as above.			tr	dk brown-black.	—	Some goethite.
	860 903										
25705	Nullabour 2	30	15	380	Dark grey clay with frags of quartz and chlorite.	tr	pyrite	tr	green	small globules	—
	530 735										
25708	Nullabour 2	10	10	40	Quartz and carbonate in even grained unconsolidated mass. Some heavy minerals.	—	—	—	—	traces of rust fragments.	—
	788 810										
25709	Nullabour 2	20	20	800	Detrital quartz in carbonate cement.	—	—	traces of rust fragments.	traces of rust fragments.	possible coatings on quartz grains	Some goethite.
	735 788										
22201	Nullabour 6	5	35	700	Mainly h.s fragments. Rare quartz and goethite	—	—	tr	white paint	—	—
	120 130										
22206	Nullabour 6	20	90	4200	Fragmented quartz + shale in dark carbonaceous clay (pyritic)	tr	pyrite	<1%	white	wood fibres some zinc coatings on grains.	
	400 480										

BORE - SAMPLE ANALYSES
CLEVE UPLANDS AND LINCOLN UPLANDS
(EYRE PENINSULA) SOUTH AUSTRALIA

Maps : SI 53-8 Whyalla, SI 53-11 Lincoln.

Bores examined :

Pendrill Sleaford No. 4 -
Kerr McGee A403-1
Kerr McGee A403-2A
Kerr McGee A403-3
Kerr McGee A405-1
Kerr McGee A405-2
Kerr McGee A405-3
Kerr McGee A405-3A
Kerr McGee A405-3B
Kerr McGee L502-1
Kerr McGee L502-2
Kerr McGee L505-1
Kerr McGee L505-2

042

INDEX NO.

LATITUDE LONGITUDE

BORE HOLE RECORD

34°50' 46" S

125° 44' 33" E

NAME OF BORE/WELL: SLEAFORD NO. 4

GEOLOGIC AREA :

_____ :

_____ :

_____ :

NOTES ON LOCATION :DATE COMPLETED : Pendrill Ltd., 1964ABBREVIATED LOG : Aeolianite (Pleist.) 0-280 ; L. Tert. lignitic sands + py. + clays 280-435 ; Archean basement 435-520
? amphibolite with crystalline pyrite.REFERENCES : DTM Fw. 324 : SR/11/5/71REMARKS :

BORE HOLE ASSAYS

INDEX NO.

			NAME OF BORE/WELL: SLEAFORD NO. 4												
	Footage		Sample Type	Lithology	Formation	Cu	Pb	Zn	Co	Ni	Mn	Cr	Ag	Au	
Assay No.	From	To				b.p.m.	b.p.m.	b.p.m.	b.p.m.	b.p.m.	b.p.m.	b.p.m.	b.p.m.	b.p.m.	b.p.m.
22667	445	450	CORE 2	Amphibolite. clay	Prot.	95	30	20	35	5	2400	25	<1	<3	
22668	480	490	CUTTINGS.	siliceous metam. rock Pyrite abundant		20	25	35	75	35	5300	120	<1	<3	
22669	490	500	"	quartzite & other metam. rocks Abundant Pyrite. ? malachite		25	20	35	50	35	3700	60	<1	<3	
22670	500	510	"	quartzite, mica amphibolite Abundant pyrite		20	20	35	100	100	4450	90	<1	<3	
22671	510	520	"	quartzite, mica amphibolite Abundant pyrite		35	10	40	30	15	3050	35	<1	<3	
22672	520	522	"	"		35	20	40	30	15	3050	35	<1	<3	
22673	522	528	CORE 3	Amphibolite pyrite		25	15	75	15	15	1700	50	<1	<3	

ASSAY TECHNIQUE: A/A AMDEL JOB NO. 2373/72

Au: semiquant. Spectro.

LATITUDE LONGITUDE

BORE HOLE RECORD

INDEX NO.

33° 31' 20"

136° 28' 15" S

NAME OF BORE/WELL: KERR-MCGEE A403/1

GEOLOGIC AREA : GAWLER CRATON

_____ :

_____ :

_____ :

NOTES ON LOCATION : Cowell-Clare Area.DATE COMPLETED : 1968ABBREVIATED LOG : 0-50 clay & sand

50-105 gneiss - fels. - qtz - ferromagnes. ; mangiferous & ferruginous veinlets.

105-110 pegmatite and pegmatitic gneiss - coarse. Fe + Mn oxides.

110-125 gneiss - granitic and pegmatitic. Fe + Mn oxides.

125-143 gneiss + schist. Crystalline. Chloritic rock with biotite, feldsp., qtz. Graphite and/or pyrite below 127'.

REFERENCES :

DPM Env. 1108

143-167 schist. Gneissic in places. Graphitic at 166'.

167-170 gneissic granite, gneiss and schist layers.

170-194 schist and gneissic qtz. Thin gneissic layers in schist. Abundant graphite.

194-200 graphitic schist.

REMARKS :

8 samples

BORE HOLE ASSAYS

INDEX NO.

			NAME OF BORE/WELL: KERR MCGEE A403/1											
Footage			Sample Type	Lithology	Formation	Cu	Pb	Zn	Co	Ni	Mn	Cr	Ag	
Assay No.	From	To				p.p.m.	p.p.m.	p.p.m.	p.p.m.	p.p.m.	p.p.m.	p.p.m.	p.p.m.	
25409	95	110	CORE	See log. Env 1108 Vol 1 App. D.		110	20	70	20	5	6500	30	<1	
25410	110	129				85	25	110	20	15	2100	35		
25411	130	140				55	20	140	20	5	9000	120		
25412	140	151				95	20	120	20	15	1600	25		
25413	151	162				75	10	140	20	20	650	25		
25414	162	173				45	10	140	20	25	630	20		
25415	173	184				55	5	180	50	30	2000	30		
25416	184	200				55	10	180	25	35	720	50		

ASSAY TECHNIQUE: A/AMDEL JOB NO. 2685/72

LATITUDE LONGITUDE

BORE HOLE RECORD

INDEX NO.

33° 32' 20" S

136° 28' 15" E

NAME OF BORE/WELL: KERR MCGEE A403/2A

GEOLOGIC AREA : GAWLER CRATON

_____ :

_____ :

_____ :

NOTES ON LOCATION : COWELL-CLEVE AREADATE COMPLETED : 1968ABBREVIATED LOG :REFERENCES :

DPM ENV. 1108

0-30 weathered gneiss; traces of graphite.

30-42 weathered schist, micaceous, feldspar.

42-59 weathered gneiss. Fels. → clays.

59-83 fault gouge and weathered gneiss. fault gouge is manguniferous, talcose, chloritic, graphitic.

83-97 brown and sandy schist, manguniferous.

97-146 gneiss. Mn + Fe rich; graphitic in places.

146-150 gneiss and pegmatite. Pegmatite is granitic with secondary Mn oxides.

REMARKS : 5 samples

BORE HOLE ASSAYS

			NAME OF BORE/WELL: KERR MCGEE A403/2A													
	Footage		Sample Type	Lithology	Formation	Cu	Pb	Zn	Co	Ni	Mn	Cr	Ag			
Assay No.	From	To				p.p.m.	p.p.m.	p.p.m.	p.p.m.	p.p.m.	p.p.m.	p.p.m.	p.p.m.	p.p.m.	p.p.m.	
25436	100	110	CORE	See log. Gneisses & Mn coatings		120	70	260	55	60	1.3%	40	2			
25437	110	119				140	60	190	10	20	1.1%	35	1			
25438	119	130				130	80	300	20	25	1.5%	30	<1			
25439	130	139.7				85	30	200	25	20	5200	35	<1			
25440	139.7	150				110	40	160	20	20	6900	35	<1			
								</								

LATITUDE LONGITUDE

BORE HOLE RECORD

INDEX NO.

33° 32' 20"

136° 28' 15"

NAME OF BORE/WELL: KERR - MCGEE A403/3

GEOLOGIC AREA : GAULDER CRATON

_____ :

_____ :

_____ :

NOTES ON LOCATION : CLIVE UPLANDSDATE COMPLETED : 1968ABBREVIATED LOG : 0-30 no core

30-80 weathered gneissic schist. Sandy.

REFERENCES :

80-129 gneiss, quartzitic in parts, qtz. veins and augens, secondary Mn, graphitic; pyritic sulphides near 119'.

DTM Env. 1102.

REMARKS : 4 samples

Log: R. Grasso, Minoil Service 1968.

LATITUDE LONGITUDE

BORE HOLE RECORD

INDEX NO.

33° 34' 25"

136° 29' 45"

NAME OF BORE/WELL: KERR MCGEE A 405/1

GEOLOGIC AREA : GAUWER CRATON

_____ :

_____ :

_____ :

NOTES ON LOCATION : Rudall 1M sheet AreaDATE COMPLETED : 1968 January 8ABBREVIATED LOG :REFERENCES : DMM ENV. 1108.

0-40 no core. Sludge of yellow-brown silic. ochre with abundant secondary Mn minerals.
 40-75 Dolomite. Grey and cream-brown, hard, rough, siliceous. Brecciated, weathered.
 Abundant fine black ?manganiferous specks in places; occasionally ochreous.
 75-110 few ft gouge and brecciated dolomite. few ft gouge composed of mainly slickensided
 clay minerals and contains orange-yellow ferruginous stains. Dolomite is brecciated,
 partly silicified and shows boxwork weathering. Abundant ferrug. secondary minerals.
 110-125 chert. Dk. grey, rough with abundant ?manganiferous silica.

6 samples

REMARKS : Log by Missil Sarvasat.

Hole depressed 50° Bearing N. 125°.

LATITUDE LONGITUDE

BORE HOLE RECORD

INDEX NO.

33° 34' 25" S

136° 29' 45" E

NAME OF BORE/WELL: KERR-MCGEE A405/2

GEOLOGIC AREA : GAWLER CRATON

_____ :

_____ :

_____ :

NOTES ON LOCATION : CLEVE UPLANDSDATE COMPLETED : 1968ABBREVIATED LOG :

0-15 no core

15-23 chert, mangiferous clay.

23-106 mangiferous and ferruginous dolomite, cherty in part.

106-170 brecciated dolomite; chloritic and graphitic fault gouge. Mn + Fe common.

170-184 recemented, brecciated schist ~ ferromagn. + gls. Graphite and pyrite common in places.

184-193 dolomite.

REFERENCES :

DTM Env. 1108

REMARKS : 16 samples

BORE HOLE ASSAYS

INDEX NO.

			NAME OF BORE/WELL: KERR MCGEE A405/2												
	Footage		Sample Type	Lithology	Formation	Cu	Pb	Zn	Co	Ni	Mn	Cr	Ag		
Assay No.	From	To				t.p.m.	t.p.m.	t.p.m.	t.p.m.	t.p.m.	t.p.m.	t.p.m.	t.p.m.	t.p.m.	t.p.m.
25441	15	30	CORE	gossanous ls		85	30	390	30	75	1300	30	1		
25442	30	41				40	30	260	75	15	8800	10	1		
25443	41	55.6				15	30	45	20	5	1400	25	1		
25444	55.6	66				25	40	110	25	15	3000	10	1		
25445	66	76				5	30	95	55	20	7900	15	1		
25446		76				5	30	110	90	20	-	10	1		
25447	76	86				5	30	85	25	35	4500	30	<1		
25448	86	95				15	30	95	30	40	4000	30	1		
25449	95	106				15	20	70	25	40	3500	60	1		
25450	106	114.2				40	170	490	270	270	6100	35	<1		
25451	114.2	126				60	110	440	250	220	7600	40	1		
25452	126	132				65	90	930	280	320	1.1%	50	1		
ASSAY TECHNIQUE: A) AMDEL JOB NO. 2685/72															

LATITUDE LONGITUDE

BORE HOLE RECORD

INDEX NO.

33° 24' 25" S

136° 29' 45" E

NAME OF BORE/WELL: KERR-MCGEE A405/3A and KERR-MCGEE A405/3

GEOLOGIC AREA : GAWLER CRATON

_____ :

_____ :

_____ :

NOTES ON LOCATION : CLEVE UPLANDSDATE COMPLETED : 1968ABBREVIATED LOG : 0-83 ~~is~~ is stored as Hole A405/3

83-91 dolomite. Broken, with secondary Mn and Fe

91-124 fault gouge and breccia. Gneissic.

REFERENCES :

124-135 schistose gneiss. Carbonate with abundant qtz. veining and graphite.

135-137 brecciated Solomitic gneiss. Traces of pyritic sulphides; black chert.

DPM Env. 1108

REMARKS :

Log by Minoil Services 1968.

LATITUDE LONGITUDE

BORE HOLE RECORD

INDEX NO.

33° 34' 25" S

136° 29' 45" E

NAME OF BORE/WELL: KERR MCGEE A405/3B

GEOLOGIC AREA : GAWLER CRATON

_____ :

_____ :

_____ :

NOTES ON LOCATION : CLEVE UPLANDSDATE COMPLETED : 1968ABBREVIATED LOG :

0-10 no core

10-90 dolomite, brown clay and chert.

90-99 silicified Solomitic breccia.

99-111 chert, stylolitic, possibly after dolomite.

111-125 brecciated dolomite.

125-132 chert after dolomite.

132-168 dolomite; manganiferous veinlets. Traces of graphite.

REFERENCES :

DTM Env. 1102

REMARKS :

Logged by Minoil Services P/L, 1968.

INDEX NO.

BORE HOLE ASSAYS

NAME OF BORE/WELL: KERR M' GEE A405/38														
	Footage		Sample Type	Lithology	Formation	Cu	Pb	Zn	Co	Ni	Mn	Cr	Ag	
Assay No.	From	To				p.p.m.	p.p.m.	p.p.m.	p.p.m.	p.p.m.	p.p.m.	p.p.m.	p.p.m.	
25417	10	20	CUTTINGS	See log. g		20	20	30	25	30	2900	20	<1	
25418	20	30			20	20	25	25	50	3000	15			
25419	30	40			40	30	25	50	60	2300	15			
25420	40	50			45	50	40	110	75	3200	20			
25421	50	60			65	60	40	120	95	3300	20			
25422	60	70			45	55	55	120	95	3800	25			
25423	70	80			100	50	90	65	35	3500	75	1		
25424	80	90			120	60	110	70	160	4100	50	2		
25425	90	107	CORE		10	35	85	15	20	2400	40	<1		
25426	107	118			15	20	150	25	25	1800	130			
25427	118	132.3		5	10	140	20	25	1400	70				
25428	132.3	144.6		15	30	160	10	25	1200	110				
ASSAY TECHNIQUE: A/A AMDEL JOB NO. 2685/72														

INDEX NO.

BORE HOLE ASSAYS

			NAME OF BORE/WELL: KERR MCGEE A405/38													
Assay No.	Footage		Sample Type	Lithology	Formation	Cu	Pb	Zn	Co	Ni	Mn	Cr	Ag			
	From	To				p.p.m.	p.p.m.	p.p.m.	p.p.m.	p.p.m.	p.p.m.	p.p.m.	p.p.m.			
25429	144.6	157.8	CORE	See log		15	40	160	15	25	1300	50	<1			
25430	157.8	168	CORE			15	55	220	25	35	2000	30	2			
			</													

LATITUDE LONGITUDE

BORE HOLE RECORD

061
INDEX NO.

33°37'50"S

136°43'35"E

NAME OF BORE/WELL: KERR-MCGEE L502/1

GEOLOGIC AREA : GAWLER CANYON

_____ :

_____ :

_____ :

NOTES ON LOCATION : CLEVE UPLANDS

DATE COMPLETED : 1968

ABBREVIATED LOG :

REFERENCES :

▶ M Env. 1108.

0-54 gneiss with pegmatite. Pegmatite at 27' & 34' of felspar & quartz; schistose bands in gneiss.
54-114 schist with pegmatite. Amphibolitic, graphitic, some chlorite; pyrite at 80', 110'.
114-118 mylonitic schist; pyrite and graphite common.
118-138 schist and dolomite; schist is amphibolitic, dolomite contains to 5% pyrite at 137'.
138-158 dolomite and mylonite; pyritic. Mylonite contains scapolite.
158-173 schist and dolomite. Chloritic schist with pyrite traces.
173-193 gneissic quartzite with some amphibole.

REMARKS :

Log by Minoil Serv. 1968

BORE HOLE ASSAYS

			NAME OF BORE/WELL: KERR-Mc GEE L502/1												
	Footage		Sample Type	Lithology	Formation	Cu	Pb	Zn	Co	Ni	Mn	Cr	Ag		
Assay No.	From	To				p.p.m.	p.p.m.	p.p.m.	p.p.m.	p.p.m.	p.p.m.	p.p.m.	p.p.m.		
25397	42	57	CORE			25	<5	20	<5	20	430	25	<1		
25398	57.4	74.2				140	5	25	15	35	500	15	<1		
25399	74.2	93.3				75	15	60	15	30	540	15	<1		
25400	93.3	107.9				95	5	40	20	50	800	20	<1		
25401	107.9	124.4				45	30	60	50	25	7100	75	<1		
25402	124.4	130				45	10	45	30	30	1900	130	<1		
25403	130	139				10	30	45	20	20	3000	25	<1		
25404	139	148				5	30	60	20	15	700	10	<1		
25405	148	157				5	30	120	20	15	1600	30	<1		
25406	157	166				35	30	110	25	15	1500	10	<1		
25407	166	175				25	20	95	25	25	930	30	<1		
25408	175	193				10	100	180	10	20	640	40	<1		
ASSAY TECHNIQUE: A/A AMDEL JOB NO. 25397-25400: 2544/72 25401-25408: 2685/2															

LATITUDE LONGITUDE

BORE HOLE RECORD

INDEX NO.

33° 37' 20"

136° 47' 20"

NAME OF BORE/WELL: KERR M. GER 1502/2

GEOLOGIC AREA : GAULHER CRATON

_____ :

_____ :

_____ :

NOTES ON LOCATION : Colcoobra mine

DATE COMPLETED : 1969.

ABBREVIATED LOG : See across.

REFERENCES : DPM Env. 1108.

REMARKS : Hole Sided at Sepperson of 60° on bearing 343° M.

- 0-10 Sludge of qtz , chlorite + black ferromag. minerals
 10-16 Amphibolite schist + pegmatite.
 16-28 Amphibolite schist
 28-29 Qtz -fels. - pegmatite.
 29-38.5 Amphibolite schist. Dk. green-grey, hard, quartzitic.
 38.5-63 Amphibolite schist with minor Dolomite lenses, quartzitic in places.
 63-64.5 Brecciated gneissic schist + pegmatite. Schist is weathered and contains thin ($\frac{1}{64}$ ") ferruginous vnlts.
 64.5-65.5 Coarsely crystalline pegmatite
 65.5-81 Amphibolite schist. Dk. grey-green, hard, quartzitic.
 81-115 Amphibolite schist. Traces of pyritic sulphides.
 115-120 Quartzitic amphibolite schist. Resembles hornfels. Dk grey, hard. Composed of finely crystalline ferromagnes. minerals, qtz , feldspar. May be chloritic in places. Pyritic sulphides common in trace amounts (vnlts $\rightarrow \frac{1}{16}$ " near 119')
- 120-155.3 Dolomite schist. Lt. grey-brown, coarsely crystalline; traces of green-black ferromag. minerals. Talcoose in part. Pyrite traces common.
- 155.3-163.5 Amphibolite schist (resembles hornfels)
 163.5-168 Acid gneiss.

 $\left. \begin{array}{l} < 0.010\% \\ U_{208} \end{array} \right\}$

BORE HOLE ASSAYS

INDEX NO.

			NAME OF BORE/WELL: KERR MCGEE L502/2												
Assay No.	Footage		Sample Type	Lithology	Formation	Cu	Pb	Zn	Co	Ni	Mn	Cr	Ag		
	From	To				p.p.m.	p.p.m.	p.p.m.	p.p.m.	p.p.m.	p.p.m.	p.p.m.	p.p.m.		
25384	10	20	CORE			45	20	35	<5	10	130	15	<1		
25385	20	32				85	40	80	5	20	220	10			
25386	32	42				75	15	75	20	20	960	10			
25387	42	52				65	10	40 40	15	15	600	10			
25388	52	63				75	45	110	25	30	620	10			
25389	63	74				60	5	35	5	15	180	15			
25390	74	89				95	5	35	15	30	340	15			
25391	89	111				100	5	40	15	20	580	10			
25392	111	120				95	10	45	30	20	3600	40			
25393	120	128.6				55	20	45	20	35	9000	180			
25394	128.6	144.2				45	20	55	15	20	2600	25			
25395	144.2	161.8				60	30	110	15	25	2000	15			
ASSAY TECHNIQUE: A/A ANAL JOB NO. 2544/72															
25396	161.8	168	END			15	10	75	15	30	460	65	<1		

LATITUDE LONGITUDE

BORE HOLE RECORD

INDEX NO.

33° 35' 35" S 136° 47' 20" E

NAME OF BORE/WELL: KERR-MC GEE L505/1

GEOLOGIC AREA : CAWLER CRATON

_____ :

_____ :

_____ :

NOTES ON LOCATION : CLEVE UPLANDSDATE COMPLETED : 1968.ABBREVIATED LOG :REFERENCES :

DTM ENV. 1108

REMARKS :

Log by Minsil Service 1968/69.

- 0-37 Limonitic and talcose clay. Manganiferous.
- 37-41 Weathered gneiss.
- 41-62 Clay, Mn/Fe oxides
- 62-71 Ferruginous gneiss. Kaolin and other clays.
- 71-79 Quartzite with diopside.
- 79-87 Pegmatite. Mn/Fe coatings.
- 87-96 Diopside.
- 96-98 Pegmatite; contains qtz. and diopside.
- 98-104 Qtz.; secondary; some ferromagnesian minerals.
- 104-157 Gneiss and quartzitic gneiss.

INDEX NO.

INDEX NO.

			NAME OF BORE/WELL: KERR MC GEE L505/1												
	Footage		Sample Type	Lithology	Formation	Cu	Pb	Zn	Co	Ni	Mn	Cr	Ag		
Assay No.	From	To				p.p.m.	p.p.m.	p.p.m.	p.p.m.	p.p.m.	p.p.m.	p.p.m.	p.p.m.	p.p.m.	
25474	41	62	CORE	See Log.		5	60	860	410	270	6.9%	20	<1		
25475	75	80	CORE			5	10	110	<5	35	2200	20	<1		
ASSAY TECHNIQUE: A AAMDEL JOB NO. 2685/72															

LATITUDE LONGITUDE

BORE HOLE RECORD

INDEX NO.

33° 35' 36" S

136° 47' 20" E

NAME OF BORE/WELL: KEAR-MCGEE L505/2

GEOLOGIC AREA : GAWLER CRATON

_____ :

_____ :

_____ :

NOTES ON LOCATION : CLIVE UPLANDSDATE COMPLETED : 1968ABBREVIATED LOG :

0-19 Silicified and ferruginised dolomite. Green opaline silica.

19-24 Iron rich chert.

24-28 Fe/Mn oxides.

28-37 Ferruginous clay.

37-48 Clay, iron oxides and chert

48-69 Talcosse clay.

69-75 Siliceous and limonitic chert. Dendrites.

75-104 Gneiss. Green inclusions.

104-114 Gneiss. Chloritic and granitic.

REFERENCES :

DTM Env. 1108

REMARKS :

Log by Minoil Service 1968.

BORE HOLE ASSAYS

INDEX NO.

			NAME OF BORE/WELL: KERR MC GEE L505/2												
	Footage		Sample Type	Lithology	Formation	Cu	Pb	Zn	Co	Ni	Mn	Cr	Ag		
Assay No.	From	To				See Log.	p.p.m.	p.p.m.	p.p.m.	p.p.m.	p.p.m.	p.p.m.	p.p.m.	p.p.m.	p.p.m.
25461	8	16	CORE	limonitic dolomite		15	25	1100	360	250	8100	35	<1		
25462	16	24				5	20	6800	640	510	2.9%	50			
25463		23				5	20	6600	410	1000	4.2%	20			
25464	24	32				15	20	6700	1100	1200	4.1%	10			
25465	32	41.6				5	20	2100	300	360	1.4%	70			
25466		35.6				5	20	970	250	190	3.1%	30			
25467	41.6	52				15	90	1200	140	190	1.7%	25			
25468	52	66.6				5	15	1440	30	75	3600	20			
25469	66.6	75.6				15	55	380	40	95	9000	15			
25470	75.6	84.2				5	10	75	<5	40	450	170			
25471	84.2	92.5				10	5	65	<5	50	150	95			
25472	92.5	102				55	20	45	25	25	1.1%	10			
ASSAY TECHNIQUE: A/P AMDEL JOB NO. 2685/72															
25473	102	114				5	15	50	10	40	1300	130			

MURRAY BASIN

LOXTON NO. 1 WELL

NORTH RENMARK NO. 1 WELL.

070

LATITUDE LONGITUDE

BORE HOLE RECORD

INDEX NO.

NAME OF BORE/WELL: LOXTON No. 1

GEOLOGIC AREA : MURRAY BASIN

_____ :

_____ :

_____ :

NOTES ON LOCATION :DATE COMPLETED : Aust. Oil & Gas Corp. Ltd.ABBREVIATED LOG :REFERENCES : D↑M Env. 264REMARKS :

072

LATITUDE LONGITUDE

BORE HOLE RECORD

INDEX NO.

34° 07' S	110° 41' E	NAME OF BORE/WELL: RENMARK NO. 1, (NORTH RENMARK NO. 1)	
GEOLOGIC AREA : MURRAY BASIN _____ : _____ : _____ : <u>NOTES ON LOCATION</u> : 054. 29. <u>DATE COMPLETED</u> : 1963 ; Aust. Oil. Corp. <u>ABBREVIATED LOG</u> : <u>REFERENCES</u> : DPM Env. 307 ; SR 11/5/90 <u>REMARKS</u> : Ended in glacial marine lower Permian 3745' - 4018'.			

BORE HOLE ASSAYS

073
INDEX NO.

		NAME OF BORE/WELL: NORTH RENMARK NO. 1												
Sample No. Assay No.	Footage		Sample Type	Lithology	Formation	Cu	Pb	Zn	Ag	Mo				
	From	To				p.p.m.	p.p.m.	p.p.m.	p.p.m.	p.p.m.				
22157	706	716	Core + cuttings	Pyritic clays, sands; carbonaceous matter with pyrite	Eocene Knight brook	15	20	'65	<1	7				
22158	716	726	Cuttings			10	15	'50		5				
22159	726	736	"			10	10	'50		4				
22160	736	746	"			5	10	40		5				
22161	746	756	"			5	10	110		4				
22162	756	766	"			10	15	'60		3				
22163	766	776	"			10	15	'50		3				
22164	776	786	"			10	10	'55		3				
22165	786	796	"			10	10	'60		5				
22166	796	806	"			10	15	'50		6				
22167	806	816	"			5	5	15		5				
22168	816	826	"			5	5	15		5				
22169	826	836	"			5	10	35		3				

ASSAY TECHNIQUE: AMBEL. JORS 2000/72 : AA Cu, Pb, Zn, Ag, Mo.

BORE HOLE ASSAYS

INDEX NO.

			NAME OF BORE/WELL: NORTH DENMARK NO.1													
	Footage		Sample Type	Lithology	Formation	Cu	Pb	Zn	Ag	Mo						
Sample No. Assay No.	From	To				p.p.m.	p.p.m.	p.p.m.	p.p.m.	p.p.m.						
22170	836	846	Collings	Purified Slugs, sands. Carbonaceous matter with pyrite.	Eocene Knight Group	5	5	15	<1	3						
22171	846	856	"			5	5	25			4					
22172	856	866	"			5	10	35			4					
22173	866	876	"			5	10	35			4					
22174	876	886	"			5	10	35			4					
22175	886	896	"			10	10	40			3					
22176	896	906	"			10	10	40			3					
22177	906	914	Core			5	5	40			4					
22178	914	924	Collings			5	15	30			4					
22179	917	924	Core			5	15	35			4					
22180	924	934	Collings			5	15	35			3					
22181	934	944	"			10	10	35			3					
22182	944	954	"	10	10	30			3							
ASSAY TECHNIQUE: AA JCS 2000/72 AA Cu Pb Zn Ag																

BORE HOLE ASSAYS

INDEX NO.

[illegible]

OFFICER AND PEDIRKA BASINS.

OFFICER

1. Birksgate No.1
2. Munyarai No.1
3. Officer No.1

PEDIRKA

4. Mt. Crispe No.1
5. Purni No.1
6. Witcherie No.1

with reference to the following bores in the

GREAT ARTESIAN BASIN

7. Oodnadatta No.1
8. Pandieburra No.1
9. Poonarunna No.1
10. Putamurdie No.1

077

LATITUDE LONGITUDE

BORE HOLE RECORD

INDEX NO.

27° 56' 20"

129° 45' 10"

NAME OF BORE/WELL: BIRKSGATE NO. 1

GEOLOGIC AREA : OFFICER BASIN

_____ :

_____ :

_____ :

NOTES ON LOCATION :DATE COMPLETED : Continental Oil 1967ABBREVIATED LOG :REFERENCES : D↑M Env. 768 : SR 11/5/250

REMARKS : Stratigraphically uncertain. Lower beds may be L. Camb. → U. Prot.
 Minn pyrite in char. shales.
 Gneiss at end of hole 6161'.

BORE HOLE ASSAYS

078
INDEX NO.

			NAME OF BORE/WELL: BIRKSGATE NO.1.													
	Footage		Sample Type	Lithology	Formation	Cu	Pb	Zn								
Assay No.	From	To				ppm	ppm	ppm								
22655	5507	5513.8	CORE			5	10	95								
22656	5513.8	5517	"			10	20	75								
22657	6153	6161	"			25	10	85								

BORE HOLE ASSAYS

			NAME OF BORE/WELL: BIRKS GATE NO. 1												
	Footage		Sample Type	Lithology	Formation	Cu	Pb	Zn	Ag						
Sample No. Assay No.	From	To				p.p.m.	p.p.m.	p.p.m.	p.p.m.						
21244	5760	5780	Cullings			20	10	70	<1						
21245	5780	5800	"			40	10	90							
21246	5800	5820	"			45	90*	80							
21247	5820	5840	"			40	20	160*							
21248	5840	5860	"			35	35	100*							
21249	5860	5880	"			40	5	85							
21250	5880	5900	"			30	10	85							
21251	5900	5920	"			45	10	90							
21252	5920	5940	"			*65	10	90							
21253	5940	5960	"			45	5	85							
21254	5960	5980	"			40	10	90							
21255	5980	6000	"			45	5	85							
21256	6000	6080	"			20	75*	550*							

ASSAY TECHNIQUE: AMDEL 508 2000/72. AA Cu, Pb, Zn, Ag.

			NAME OF BORE/WELL: BIRKSGATE NO.1.														
	Footage		Sample Type	Lithology	Formation	Cu	Pb	Zn	Ag								
Sample No. Assay No.	From	To				p.p.m.	p.p.m.	p.p.m.	p.p.m.								
21257	6020	6040	Cuttings			20	10	80	<1								
21258	6040	6060	"			40	10	55									
21259	6060	6080	"			35	50	140*									
21260	6080	6100	"			25	40	110									
21261	6100	6120	"			35	35	70									
21262	6120	6140	"			30	15	200*									
21263	6140	6153	"			40	90*	140*	Core no 9 included 6153'-6161'								

082

LATITUDE LONGITUDE

BORE HOLE RECORD

INDEX NO.

NAME OF BORE/WELL: MUNYARAI NO.1 WELL

GEOLOGIC AREA : OFFICER BASIN

_____ :

_____ :

_____ :

NOTES ON LOCATION :DATE COMPLETED : Continental Oil. 1969.ABBREVIATED LOG :REFERENCES : DPM SR 11/5/293 Env. 979

REMARKS : 9039', 9035' Grey shales with calcite-barite, minor pyrite veins.
8310' Laminated shale with ^{6 mm.} ~~6 mm.~~ pyrite layers

BORE HOLE ASSAYS

083
INDEX NO.

			NAME OF BORE/WELL: MUNYARAI No.1 WELL													
Assay No.	Footage		Sample Type	Lithology	Formation	Gr	Pb	Em								
	From	To					%									
21267	8300	8320	Cuttings & chips of	Laminated shale with 6mm pyrite layers.	Ord(?) Dev.	SiO ₂	59.5									
		Core No.13	8310-8320			Al ₂ O ₃	12.5									
						Fe ₂ O ₃	5.8									
						CaO	4.7									
						MgO	4.3									
						Na ₂ O	1.3									
						K ₂ O	2.5									
						MnO	0.10									
						P ₂ O ₅	0.10									
						TiO ₂	0.65									
						Cr ₂ O ₃	<0.10									
						V ₂ O ₅	<0.05									
ASSAY TECHNIQUE: AMDEL JOB NO. 2000/72						Loss Ign.	7.75									

SILICATE ANALYSIS: SCHEME H1.

084.
INDEX NO.

			NAME OF BORE/WELL: MUNYARAI No.1											
Assay No.	Footage		Sample Type	Lithology	Formation	Cu	Pb	Zn	Ag	Ba.				
	From	To				pp.m.	ppm	ppm	ppm	ppm.				
21267	8300	8320	Cuttings + Core 13 8310/20			40	25	160	<1					
21268	8320	8340	Cuttings			40	270	1500						
21269	9020	9040	Cuttings + Core 15 9030/40			30	50	120		600				
21270	9040	9060	Cuttings			50	1100	3300		400				
21271	9060	9080	"			150	95	230		700				
21272	9080	9100	"			30	140	220		400				
21273	9100	9120	"			40	65	230		800				
21274	9120	9140	"			30	65	95		400				
21275	9140	9160	"			35	35	140		600				
21276	9160	9180	"			50	60	240		500				
21277	9180	9200	"			35	25	180		700				
21278	9200	9220	"			30	30	170		400				

ASSAY TECHNIQUE: AMDEL JOB NO. 2000/72 AA Cu, Pb, Zn, Ag Ba Semi Q.

			NAME OF BORE/WELL: MUNYARAI No.1												
	Footage		Sample Type	Lithology	Formation	Cu	Pb	Zn	Ag	Ba					
Assay No.	From	To				ppm	ppm	ppm	ppm	ppm					
21279	9220	9240	Cuttings			30	45	410	<1	400					
21280	9240	9260	"			35	50	120		400					
21281	9260	9280	"			35	55	140		500					
21282	9280	9300	"			35	40	180		500					
21283	9300	9320	"			25	30	100		500					
21284	9320	9340	"			40	740	3100		800					
21285	9340	9360	"			25	150	550		900					
21286	9360	9380	"			30	90	330		600					
21287	9380	9400	"			40	50	160		600					
21288	9400	9420	"			100	50	160		1000					
21289	9420	9440	"			35	75	200		1500					
21290	9440	9460	"			30	35	120		800					
ASSAY TECHNIQUE: AMDEL JOB NO. 2000/72 AA Cu, Pb, Zn, Ag Ba Semi Q															

BORE HOLE ASSAYS

			NAME OF BORE/WELL: MUNYARAI No.1														
	Footage		Sample Type	Lithology	Formation	Cu	Pb	Zn	Ag	Co.	Ni	Ba					
Assay No.	From	To				ppm	ppm	ppm	ppm			ppm					
21291	9460	9480	Cuttings			85	60	160	<1			800					
21292	9480	9500	"			35	25	120				600					
21293	9500	9510	Core No.16			25	25	75		5	35	1000					

INDEX NO.

BORE HOLE ASSAYS

[illegible]

LATITUDE LONGITUDE

BORE HOLE RECORD

INDEX NO.

27°30'53"S

132°18'10"E

NAME OF BORE/WELL: OFFICER NO.1

GEOLOGIC AREA : OFFICER BASIN

_____ :

_____ :

_____ :

NOTES ON LOCATION :DATE COMPLETED : 1966ABBREVIATED LOG : see acrossREFERENCES :

- Spigg R.C. et. al. in Geol. of S.A (Ed. Glaessner & Parkin)
 Ludbrook, N.U., 1961 Perm. to Cret. subsurface stratigraphy
 between Lake Phillipson and the Peake and
 Denison Rgs. Trans. R. Soc. S.A. 85
 Wolfner, H., 1964 Perm-Jurassic history of the western
 Great Artesian Basin. Trans. R. Soc. S.A. 88.

REMARKS : shallow stratigraphic well.

- 0-10 surface sand and caprock.
 10-110 sandy clay, white. Magnetite, ilmenite and rutile fragments;
 gypsiferous. ? Permian.
 110-140 feldspathic sandstone - fragments of granite and
 volcanics (epidote)
 140-150 as above - some pyrite in quartz aggregate.
 150-160 as above - coarser grained. Shale fragments and pebbles.
 160-240 pebbly feldspathic sandstone. Acid pebbles of granite,
 porphyry, biotite granite etc.
 240-300 as above - few calcareous patches.
 300-590 generally similar to above. Part calcareous cement.
 590-601 white friable pebbly sandstone. Some clay galls

089
INDEX NO.

089
INDEX NO.

			NAME OF BORE/WELL:		OFFICER No.1									
	Footage		Sample Type	Lithology	Formation	Cu	Pb	Zn	Mn	U				
Assay No.	From	To				ppm	ppm	ppm	ppm	ppm				
25339	300	310	Core 1			5	<5	20	170	2				
25340	591	601	Core 2			5	<5	35	160	<2				
25341	0	20	Cuttings			10	10	5	240					
25342	20	40	"			5	20	15	40					
25343	40	60	"			5	10	40	40					
25344	60	80	"			5	25	15	70					
25345	80	100	"			5	5	10	85					
25346	100	120	"			5	5	30	55					
25347	120	140	"			5	5	35	440					
25348	140	160	"			5	5	30	540					
25349	160	180	"			5	5	25	280					
25350	180	200	"			5	<5	35	220					

ASSAY TECHNIQUE: AMDEL JOB NO. 2544/72

BORE HOLE ASSAYS

090
INDEX NO.

			NAME OF BORE/WELL: OFFICER No. 1												
	Footage		Sample Type	Lithology	Formation	Cu	Pb	Zn	Mn						
Assay No.	From	To				ppm	ppm	ppm	ppm						
25351	200	220	Cuttings			5	<5	20	260						
25352	220	240	"			5	5	20	190						
25353	240	260	"			5	<5	20	160						
25354	260	280	"			5	<5	15	190						
25355	280	300	"			5	<5	15	190						
25356	300	320	"			15	<5	25	150						
25357	320	340	"			5	10	15	190						
25358	340	360	"			5	5	15	240						
25359	360	380	"			5	<5	15	110						
25360	380	400	"			5	5	20	180						
25361	400	420	"			5	5	20	160						
25362	420	440	"			5	5	15	120						
ASSAY TECHNIQUE: AMDEL JOB NO. 2544/72															

BORE HOLE ASSAYS

091
INDEX NO.

			NAME OF BORE/WELL: OFFICER No.1												
	Footage		Sample Type	Lithology	Formation	Cu	Pb	Zn	Mn						
Assay No.	From	To				ppm	ppm	ppm	ppm						
25363	440	460	Cuttings			5	5	20	210						
25364	460	480	"			5	<5	20	190						
25365	480	500	"			5	5	20	170						
25366	500	520	"			5	10	20	260						
25367	520	540	"			5	5	25	170						
25368	540	560	"			5	<5	15	220						
25369	560	580	"			5	5	15	150						
25370	580	590	"			5	<5	20	190						

ASSAY TECHNIQUE: AMDEL JOB NO. 2544/72

LATITUDE LONGITUDE

BORE HOLE RECORD

092
INDEX NO.

26° 26' 13"

135° 22' 36"

NAME OF BORE/WELL: MT. CRISPE NO. 1.

GEOLOGIC AREA : PREDIKTA BASIN

0-40. Surf. weather zone Recent.
 40-110. Tanbe formation shale & ls interb.
 110-620. Tanbe formation Gray shale & ls lenses.
 Pyrit. shales.
 620-700 Transition Beds s/s/gray shale
 minor fault.
 700-1480 Merg. Sandstone. Py. trace.
 1480-1915 Wichee formation?
 Qtzite contains by conglomer. py.
 about 100'. Some porphyroclasts
 minerals in quartzite.

NOTES ON LOCATION :DATE COMPLETED :ABBREVIATED LOG :REFERENCES :REMARKS :

1915-2235 Unnamed. Predominately siltstone. G.S. 2235
 with thick quartzite.
 2235-2575 Unnamed. Quartzite sandst. G.S. 2575
 thin interbeds of shaly siltst.
 2575-3265 Unnamed. Red brown siltst & quartzite G.S. 3265
 interbeds
 3265-4225 Laminar ls (sp?) Mostly sandst. G.S. 4225
 with some quartzite/siltstone units
 4225-4605 Unnamed. Red brown siltst.; ?
 minor quartzite
 4605-5647 Unnamed. massive sandst unit ?
 & occasional silty beds.
 Redd environment. Pyrit. siltst.

BORE HOLE ASSAYS

096

INDEX NO.

			NAME OF BORE/WELL: MT. CRISPE												
	Footage		Sample Type	Lithology	Formation	Cu	Pb	Zn	Ag						
Assay No.	From	To				ppm	ppm	ppm	ppm						
25837	2700	2710	Cuttings			5	5	30	<1						
25838	2800	2840	"			5	5	25	<1						
25839	2850	2900	"			5	5	65	<1						
25840	2900	2950	"			5	30	110	<1						
25841	2950	3000	"			5	20	50	<1						
25842	3000	3050	"			5	10	45	<1						
25843	3050	3100	"			5	10	40	<1						
25844	3100	3150	"			5	20	110	<1						
25845	3150	3200	"			5	15	40	<1						
25846	3200	3250	"			5	25	55	<1						
25847	3250	3300	"			10	5	30	<1						
25848	3300	3350	"			10	25	75	<1						

ASSAY TECHNIQUE:	AMDEL JOB NO.	2761/72
------------------	---------------	---------

BORE HOLE ASSAYS

098
INDEX NO.

			NAME OF BORE/WELL: MT. CRISPE												
	Footage		Sample Type	Lithology	Formation	Cu	Pb	Zn	Ag						
Assay No.	From	To				ppm	ppm	ppm	ppm						
25861	3950	4000	Cuttings			5	30	50	<1						
25862	4000	4050	"			5	20	40	<1						
25863	4050	4100	"			5	15	50	<1						
25864	4100	4150	"			5	35	400	<1						
25865	4150	4200	"			5	15	100	<1						
25866	4200	4250	"			5	15	140	<1						
25867	4250	4300	"			5	15	100	<1						
25868	4300	4350	"			5	15	55	<1						
25869	4350	4400	"			10	140	600	<1						
25870	4400	4450	"			15	120	320	<1						
25871	4450	4500	"			10	50	250	<1						
25872	4500	4550	"			15	35	130	<1						
ASSAY TECHNIQUE: AMDEL JOB NO. 2761/72															

BORE HOLE ASSAYS

099

INDEX NO.

			NAME OF BORE/WELL: MT. CRISPE												
	Footage		Sample Type	Lithology	Formation	Cu	Pb	Zn	Ag						
Assay No.	From	To				ppm	ppm	ppm	ppm						
25873	4550	4600	Cuttings			5	30	100	<1						
25874	4600	4650	"			10	45	140	<1						
25875	4650	4700	"			10	30	85	<1						
25876	4700	4750	"			10	50	110	<1						
25877	4750	4800	"			10	30	75	<1						
25878	4800	4850	"			15	40	90	<1						
25879	4850	4900	"			20	25	85	<1						
25880	4900	4950	"			30	20	60	<1						
25881	4950	5000	"			15	15	70	<1						
25882	5000	5050	"			15	20	50	<1						
25883	5050	5100	"			10	25	80	<1						
25884	5100	5150	"			35	55	220	<1						
ASSAY TECHNIQUE: AMDEL JOB NO. 2761/72															

BORE HOLE ASSAYS

INDEX NO.

			NAME OF BORE/WELL: MT. CRISPE											
Footage		Sample Type	Lithology	Formation	Cu	Pb	Zn	Ag						
Assay No.	From				To	ppm	ppm	ppm	ppm					
25885	5150	5200	Cuttings		45	35	65	<1						
25886	5200	5250	"		65	30	70	<1						
25887	5250	5300	"		25	20	75	<1						
25888	5300	5350	"		10	40	65	<1						
25889	5350	5400	"		15	45	180	<1						
25890	5400	5450	"		5	10	70	<1						
25891	5450	5500	"		5	5	20	<1						
25892	5500	5550	"		5	<5	10	<1						
25893	5550	5600	"		5	<5	5	<1						
25894	5600	5635	"		5	<5	30	<1						

ASSAY TECHNIQUE: AMDEL JOB NO. 2761/72

LATITUDE LONGITUDE

BORE HOLE RECORD

26° 17' 10" S	136° 5' 35" E	NAME OF BORE/WELL: PURNI NO. 1 WELL	
GEOLOGIC AREA : WEST COOPER BASIN - PEDIRKI. _____ : _____ : _____ : NOTES ON LOCATION : DATE COMPLETED : French Petroleum 1964 ABBREVIATED LOG : Tert & Quat. 0-381 Cret. 381-3360 Jurassic 3360-4650 _____ DISCONFORM _____ PERMIAN 4650-5860 _____ DISCONFORM. _____ PREPERM. 5860-6168 REFERENCES : REMARKS :			

LATITUDE LONGITUDE

BORE HOLE RECORD

INDEX NO.

26° 22' 20"

135° 39' 10"

NAME OF BORE/WELL: WITCHERIE WELL

Elev. 331'

En. 347.

GEOLOGIC AREA : PEDIRKA BASIN

Cret. Tamba Form. 50-396 mudstone + silty s/s. Dark shale & siltst. base

Doma form. 396-910 grey black shales & thin s/s.

Tamba Beds 910-1037 black carb. clay & v. fine s/s & sand.

v. Tamba. Marga s/s 1037-1819 s/s + sand

Perm. Crown Pt. Unit 1819-2150 clay + s/s congl. & congl. levels at top.

Dev. ? Fink Rimbels Unit III 2150-2614 sandy shales & congl. s/s

" II 2614-3259 gray-pink congl.

" I 3259-3838 white grey sand

up.

L. Dal. ? Ord. ? 3838-4803 TD.

Witcherie gtzite - quartzite & few
layers of fine clay.NOTES ON LOCATION :DATE COMPLETED : 1964 French Petroleum Co.ABBREVIATED LOG :

Fink Rimbels Beds (Dev ?) 2150'-3838'

— UNCONFORMITY —

Lower Palaeozoic (?) Ordovician (?) 3838'-4803' Witcherie gtzite (cf. Indulkana gtzite).

REFERENCES :

DPM Env. 347.

DPM Strat. Bore List number 429.

REMARKS : Measured natural radioactivity in argillaceous beds 1550' & 2015' (Permian Crown Point Unit).

			NAME OF BORE/WELL: WITCHERIE No. 1												
	Footage		Sample Type	Lithology	Formation	Cu	Pb	Zn	Th	U	Ni	Ba			
Assay No.	From	To				P.P.M.	P.P.M.	P.P.M.		P.P.M.	P.P.M.	P.P.M.			
21326	1560	1560	Cuttings			20	20	45	-	<2	10	100			
21327	1570	708	"						<2	<2					
21328	1575	1595	"						2	<2					
21329	1920	1940	"						5	<2					
21330	1940	1960	"						<2	<2					
21331	1960	1980	"						5	<2					
21332	1990	2000	"						3	<2					
21333	2000	2050	"						7	<2					
21334	2050	2100	"						4-5	<2					
21335	2100	2150	"						9-10	<2					
21336	2750	2200	"						5	<2					

ASSAY TECHNIQUE: AMDEL JOB NO. 1500/77.

LATITUDE LONGITUDE

BORE HOLE RECORD

105
INDEX NO.

27° 26'

125° 21'

NAME OF BORE/WELL: Chandanatha No 1.

GEOLOGIC AREA : GREAT ARTESIAN BASIN

:

:

:

NOTES ON LOCATION :DATE COMPLETED : Same.ABBREVIATED LOG : 50-K₁-1292-?-1333 T.D.
Dim strat. Bn list.REFERENCES : Handbook Sp. Geol. G.S.S. 1969. pp. 152.REMARKS :

0-5, 20 ft. sandstone.

50-104 mudstone, micaceous siltst. & s/s

104-217'6" sandy mudstone, fossilif.

217'6"-300 grey blue mudstone, fossilif., pye. 310-317.

300-596 silty mudstone, pye. common, fossil, rare s/s & carbon. bands.

596-743 interbedded mudstone & f.g. sandstone. Some pyrite.
rare s/s.

743-810 dk. grey fossilif. mudstone.

810-848 sandstone - silty streaks.

848-966 dk. grey pyritic mudstone.

966-1300 sandy material no bore recovery.

1300-1332 quartzite. Cherty in part, otherwise siltstone.

BORE HOLE ASSAYS

106
INDEX NO.

			NAME OF BORE/WELL: OODNADATTA No.1.														
	Footage		Sample Type	Lithology	Formation	Cu	Pb	Zn	Ag								
Assay No.	From	To				#ppm	#ppm	#ppm	#ppm								
25760	1252	1262	Cullings			5	5	35	<1								
25761	1262	1267	"			5	20	25	<1								
25762	1272	1282	"			5	5	25	<1								
25763	1282	1287	"			5	40	25	<1								
25764	1292	1297	"			10	30	25	<1								
								</									

LATITUDE LONGITUDE

BORE HOLE RECORD

26°45'34.5"	139°25'03.1"	NAME OF BORE/WELL: PANDIEBURRA NO.1.	
GEOLOGIC AREA : GREAT ARTESIAN BASIN COOPER BASIN			
_____ :			
_____ :			
_____ :			
NOTES ON LOCATION :			
DATE COMPLETED : Delhi Santos 1963			
ABBREVIATED LOG : 0-330 cement + gypsum ; 330-2275 Winton carb. shales ; 2275-3462 Tambora ; fish scale zone. 3462-3484 (Albian) ; 3484-4174 Roma shales ; 4174-4370 Transition Bed ; Murgah s/s, conglom. 4370-5050, Walloon form. (Murgah) 5050-5342 ; Hellen s/s (L-moor) 5342-6770 ; U Tarnah s/s 6770-6970 ; L.O.D. 6970-7053 pyrite REFERENCES : DPM Env. 312 ; SR11/5/102 or the quartzite with minor mixtures, pyritic shale.			
REMARKS : T.D. 7253' in Ord. sandstone. Orthoquartzite with pyrite 7023'-7253'.			

[illegible]

ASSAY TECHNIQUE: AMDEL JOB 2000/72 AA Cu, Pb, Zn, Ag

LATITUDE LONGITUDE

BORE HOLE RECORD

INDEX NO.

27° 51' 20"	137° 51' 50"	NAME OF BORE/WELL: POONARUNNA NO.1.	
-------------	--------------	-------------------------------------	--

GEOLOGIC AREA : GREAT ARTESIAN BASIN

_____ :

_____ :

_____ :

NOTES ON LOCATION :

DATE COMPLETED : French Petroleum

ABBREVIATED LOG : Penetrate Jurassic for 1375' to 5349' then into unknown formation beyond unconformity [Conformity?]

REFERENCES : Env. 451 D.M. 11/5/149.
Hawthorne Sp. Geol. S.S.S.P. p. 113.

0-313 Tert. & Quat. sand/allo. /dolomite; Cret. 313-3970; Jurassic 3970-5349;
Unknown formation 5349-5575 siltstone to 5915 then argillaceous quartzite
with traces of pyrite.

REMARKS :

BORE HOLE ASSAYS

[illegible]

BORE HOLE ASSAYS

113
INDEX NO.

			NAME OF BORE/WELL: <i>BOONARUNNA No.1</i>											
Assay No.	Footage		Sample Type	Lithology	Formation	Cu	Pb	Zn						
	From	To				<i>ppm</i>	<i>ppm</i>	<i>ppm</i>						
22301	5340.9	5343	<i>Cone</i>			15	30	75						
22302	5343	5346.5	"			15	30	70						
22303	5346.5	5349.4	"			25	30	85						
22304	5349.4	5351.1	"			25	20	35						
22305	5351.1	5354.4	"			15	65	10						
22306	5354.5	5357.3	"			15	55	30						
22307	5357.3	5360	"			15	30	20						
22308	5360	5362	"			20	35	10						

ASSAY TECHNIQUE: AMDEL JOB NO.

2373/72

BORE HOLE ASSAYS

114
INDEX NO.

			NAME OF BORE/WELL: POONARUNNA NO. 1											
	Footage		Sample Type	Lithology	Formation	Cu	Pb	Zn	V	W	Mo	Be	Ag	
Sample No. Assay No.	From	To				p.p.m.	p.p.m.	p.p.m.	p.p.m.	p.p.m.	p.p.m.	p.p.m.	p.p.m.	
22146	5380	5400	Cuttings		*	1450*	660*	210*	60	x	x	3		
22147	5400	5420	"			100*	95*	45*	80	x	x	1		
22148	5420	5440	"			270*	110*	30*	80	x	*20	3		
22149	5440	5460	"			35*	25*	30*	60	x	x	1		
22150	5460	5480	"			40*	35*	30*	80	x	x	1		
22151	5480	5500	"			20	30	25	60	x	x	1		
22152	5500	5520	"			20	20	25	60	x	x	3		
22153	5520	5540	"			25	15	20	100	x	x	3		
22154	5540	5555	"			20	15	20	80	x	x	1		
22299	5337	5338 1/2	" Core			15	22	35	—	—	—	—	<1	
22300	5338 1/2	5340 1/4	" Core			15	15	70	—	—	—	—	<1	

ASSAY TECHNIQUE: AMDEL JOB 1500/72 CI (Cu, Pb, Zn) Semiquant. Spec. V, W, Mo, Be

LATITUDE LONGITUDE

BORE HOLE RECORD

INDEX NO.

26° 16' 31"

130° 46' 35"

NAME OF BORE/WELL: POTAMORDIE NO. 1

GEOLOGIC AREA : GREAT ARTESIAN BASIN

_____ :

_____ :

_____ :

NOTES ON LOCATION :DATE COMPLETED : Delhi Santos 1963

ABBREVIATED LOG : Recent Test. sand, clay & siltst. on 2100 ; U. Cret. Winton fm. 2100-2220 ; L. Cret. Rolling Down Gp. 2220-3305 ;
 Roman Gp. Plastic shales, claystones ; siltstones (glau.) 3305-3970 ; U. Perm. / L. Cret. Elythia Gp. 3970-5993 ;
 ? Triassic unnamed siltst. 6003-6130 ; ? Ordovician unnamed 6130-6406. Crinoid quartzite with minor

REFERENCES :

Thin beds of shale. Shale is typical ; pyrite trace in quartzite.

P. Permian 6130-6406 T.D.

Env. 322 D.P.M. < 211/5/07.

REMARKS :

BORE HOLE ASSAYS

116
INDEX NO.

			NAME OF BORE/WELL: PMTAMURDIE											
	Footage		Sample Type	Lithology	Formation	Cu	Pb	Zn						
Assay No.	From	To				ppm	ppm	ppm						
22664	6154	6163	Core			15	10	310 ⁸						
22665	6402	6406	"			10	10	190 ⁸						
22666	6402	6406	Cuttings			5	10	20						

ASSAY TECHNIQUE: A/AANDEL JOB NO. 2373/72

* NOTE: Sample contaminated for Zinc

ARCKARINGA SUB-BASIN
OF THE GREAT ARTESIAN BASIN

Boorthanna No. 1

Cootanoorina No. 1

Karkaro No. 1

Lambina No. 1

Mt. Furner No. 1

Mt. Willoughby No. 1

Wallira No. 1

Wallira No. 2

LATITUDE LONGITUDE

BORE HOLE RECORD

23° 56' 4" S

135° 45' 18" E

NAME OF BORE/WELL: BOORTHANNA No. 1

GEOLOGIC AREA : ARCHARINGA BASIN

_____ :

_____ :

_____ :

NOTES ON LOCATION : 36 miles west of William Creek. Within Occidental Minerals S.M. 329 (for potash following Dev. evaporites in S.A. Mines Dept. well Cooranoola No. 1, 33 miles SSW Oodnadatta).

DATE COMPLETED :

ABBREVIATED LOG : 0-150' Cadna-Owie Formation L. Cret.
 150-210' Mt. Teandina Beds L. Perm.
 210'-3800' Carb. to L. Perm.

3800-4021 Metavolcanics Precambrian.

REFERENCES : D.M. Env. 1313REMARKS : No identifiable Dev. or evaporite strata.

6" core recovered 4020'-4021' : trachyandesite vlc.; haematite; qtz. stringers carrying pyrite, chalcopyrite.

LATITUDE LONGITUDE

BORE HOLE RECORD

INDEX NO.

29° 00' 30"

135° 20'

NAME OF BORE/WELL: COOTANCORINA NO. 1.

GEOLOGIC AREA : ARCHARINGA BASIN

_____ :

_____ :

_____ :

NOTES ON LOCATION : 33 m ssw OoSnadattaDATE COMPLETED : 1967ABBREVIATED LOG : L. Cret. Bulldog shale 6' - 370' ; L. Cret. Cadna-Owie Form. 370-467 ; U. Jur. / L. Cret. Algebuckina s/s 467'-615' / ^{unc.} L. Perm. Mt. Toondina Beds 615 - 1695 ; L. Perm. Unit 1 : 1695 - 2550 ; Carb.-Perm. Unit 2 : 2550-2925 ^{unc.} / Dev. unit 3 2925' - 3111'REFERENCES : DPM Rept 65/04 L.S. 384V DPM 1510/67.

DPM Env. 1313 Occidental Mine Potash Smr 329.

REMARKS : 2925-3111 : shallow marine embayment with restricted circulation environment.
Dolomite at top of Devonian.

BORE HOLE ASSAYS

121
INDEX NO.

			NAME OF BORE/WELL: COOTANOORINA No.1											
Assay No.	Footage		Sample Type	Lithology	Formation	Cu	Pb	Zn	Ag	U				
	From	To				ppm	ppm	ppm	ppm	ppm				
22515	362	372	Cove 1			20	10	75	<1	2				
22516	633	638	" 2			25	20	160						
22517	1235	1246	" 3			45	45	65						
22518	1742	1752	" 4			25	25	130						
22519	2356	2360	" 5			15	10	180						
22520	2695	2696	" 6			5	5	95						
22521	2862	2867	" 7			5	15	95						
22522	2914	2917	" 8			5	5	90						
22523	3036	3046	" 9			5	100	460						
22524	3093	3103	" 10			10	10	80						
22525	3103	3110	" 10			20	15	55						
22526	2920	2930	Cuttings			10	25	40						
22527	2930	2940	"			5	15	40						

ASSAY TECHNIQUE: AMDEL JOB NO. 2373/72

LATITUDE LONGITUDE

BORE HOLE RECORD

INDEX NO.

28°35'58"

122°46'27"

NAME OF BORE/WELL: KARKARO NO.1.

GEOLOGIC AREA : WEST ARCHARINGA BASIN

_____ :

_____ :

_____ :

NOTES ON LOCATION :DATE COMPLETED : 1970ABBREVIATED LOG :REFERENCES : DTM 551/69

DTM Rept. BK.70/40 G.S. no. 4427:1970

Stat. Drilling programme 1970 Western Archangai Basin

1424-1428 bit Perm.

1554-1560 untextured granite
mg. ssREMARKS : T.D. 1579'

BORE HOLE ASSAYS

123
INDEX NO.

[illegible]

LATITUDE LONGITUDE

BORE HOLE RECORD

27°31'00"	134°17'06"	NAME OF BORE/WELL: LAMBINA NO.1	
GEOLOGIC AREA : ARCAZINGA SUB-BASIN _____ : _____ : _____ : <u>NOTES ON LOCATION</u> : <u>DATE COMPLETED</u> : 1970 <u>ABBREVIATED LOG</u> : <u>REFERENCES</u> : DTM Rept. 70/79 R.C.N. Thornton 1970 <u>REMARKS</u> : T.D. 1457 in Lower Permian. DiS not continuous to basement.			

BORE HOLE ASSAYS

125
INDEX NO.

[illegible]

LATITUDE LONGITUDE

BORE HOLE RECORD

INDEX NO.

28° 6' 15"

135° 28' 30"

NAME OF BORE/WELL: MT. FURNER NO. 1.

GEOLOGIC AREA : WESTERN ARCKARINGA BASIN

_____ :

_____ :

_____ :

NOTES ON LOCATION :DATE COMPLETED : DFM 1970.ABBREVIATED LOG :REFERENCES : DFM 551/69 Rept. BK. 70/40 G.S. 12 4427. : Strat. Dnly Programme 1970, Western Arckaringa Basin.REMARKS : Banded granite gneiss basement 1802 - 1821 T.D.

LATITUDE LONGITUDE

BORE HOLE RECORD

27°29'46"S	124°16'29"E	NAME OF BORE/WELL: MT. WILLOUGHBY NO. 1	
------------	-------------	---	--

GEOLOGIC AREA : ARCHAEA SUB-BASIN

_____ :

_____ :

_____ :

NOTES ON LOCATION : 80 m w of O'Shaughnessy; Wintinna 1 M sheet

DATE COMPLETED : 1970

ABBREVIATED LOG :

REFERENCES : DPM Rept 71/37 Mt. Willoughby No. 1 well Complet. Rept.
R. C. N. Thornton 1971

REMARKS :

L. Cret. Bull Dog Shale 0-220
Ca. Sna-Owie formn. 330-474
u. Terr. Algebuckina s/s 475-655
L. Perm. Mt. ToonSi-a Beds 655-950
silty sand, calc. below 850'
pyrite bands common.
Unit 2 960-2046
Dev. ? Unit 3 T.D. 2046-2090.8
ls, gray, dense, massive
fine siltstone; most is
recryst. micrite; algal
stromatolites at base.

LATITUDE LONGITUDE

BORE HOLE RECORD

INDEX NO.

29° 27' 03"

134° 04' 31"

NAME OF BORE/WELL: WALLIRA NO. 1.

GEOLOGIC AREA : WESTERN ARCHERINA BASIN

_____ :

_____ :

_____ :

NOTES ON LOCATION :DATE COMPLETED : DPM 1970.ABBREVIATED LOG :REFERENCES : DPM 551/69 Rept. Bk. 70/40 G.S. no 4457. Strat. Drilling Prog. West Arch. Basin 1970. - H.S. Townsend.REMARKS : f.g. granite gneiss basement 710' - 751.6'
DPM age dating 700' 0" - 751' ; 716' 10" - 718' 11".

BORE HOLE ASSAYS

			NAME OF BORE/WELL: WALLIRA No. 1											
	Footage		Sample Type	Lithology	Formation	Cu	Pb	Zn						
Assay No.	From	To				ppm	ppm	ppm						
21373	670	680	Core			10	10	100						
21374	707	711	Core			15	25	310						
21375	711	721	Core			95	35	330						

ASSAY TECHNIQUE: AAMDEL JOB NO. 2373/72

132

LATITUDE LONGITUDE

BORE HOLE RECORD

INDEX NO.

29° 22' 26"

133° 49' 12"

NAME OF BORE/WELL: WALLIRA NO. 2.

GEOLOGIC AREA : WESTERN ARCHERDA BASIN

_____ :

_____ :

_____ :

NOTES ON LOCATION :DATE COMPLETED : DTM 1970.ABBREVIATED LOG :REFERENCES : DTM 551/69. Rept. Bk. 70/40 G.S. No. 4427 1970. Strat. Drilling Prog. West Arch. Basin - I.J. Townsend.REMARKS : DTM age dating sample 1097' 4" - 1098' 11".

Torcoola SSN NO 1, 2, 3, 4
Maralinga NO 1, 2, 3, 5
Kyalasing Hill
General Hill

50
134

BORES OF THE NORTHERN EUCLA BASIN

and

MARALINGA AREA

WITH PARTICULAR REFERENCE TO THE OBSERVATORY HILL BEDS.

COOK NO. 1	OUTBACK OIL	30°50'30"; 130°41'00"
DENMAN NO. 1	OUTBACK OIL	30°29'20"; 129°58'47"
EMU NO. 1	EXOIL N.L.	28°37'45"; 132°12'05"
EMU FLAT BORE 1	LRWE	28°27'20"; 132°30'43"
HUGHES NO. 1		30°42' ; 129°30'44"
HUGHES N.W. NO. 2		30°31'14"; 129°14'45"
HUGHES N.E. NO. 3		30°29'45"; 129°38'07"
MARALINGA BORE 5	LRWE	29°57'15"; 131°39'15"
MARALINGA BORE 7	LRWE	30°10'00"; 131°36'10"
MARALINGA BORE 8A	LRWE	30°08'20"; 131°35'30"
MARALINGA BORE 11B	LRWE	30°09'10"; 131°37'00"
MARALINGA BORE 12	LRWE	30°11'15"; 131°37'45"



LATITUDE LONGITUDE

BORE HOLE RECORD

INDEX NO.

30° 50' 30"

130° 41' 00"

NAME OF BORE/WELL: COOK NO. 1.

GEOLOGIC AREA : EUCLA BASIN

_____ :

_____ :

_____ :

NOTES ON LOCATION :DATE COMPLETED : OCTOBER 11, 1964.ABBREVIATED LOG : Strat. list DPM given 0-25 - L. mloc. - 175 - U. Eoc. - 346 - Eo. - 470 - P. -REFERENCES : DPM Env. 645.

DPM Strat. Bore list No. 1140

REMARKS : Cambrian (?) dolomite, limestone & sandstone 575' - 915'.

BORE HOLE ASSAYS

			NAME OF BORE/WELL: COOK No.1											
	Footage		Sample Type	Lithology	Formation	Cu	Pb	Zn	Ag					
Assay No.	From	To				Ppm	Ppm	Ppm	Ppm					
22279	520	540	Cuttings			5	270	10000	<1					
22280	540	560	"			15	110	430						
22281	560	580	"			5	100	85						
22282	580	600	"			5	30	95						
22283	600	620	"			10	20	110						
22284	620	640	"			10	25	310						
22285	640	660	"			15	180	310						
22286	660	680	"			5	180	170						
22287	680	700	"											
22288	700	720	"			5	25	240						
22289	720	740	"			20	100	1100						
22290	740	760	"			10	390	440						

ASSAY TECHNIQUE: AMDEL JOB NO. 2373/72

BORE HOLE ASSAYS

INDEX NO.

			NAME OF BORE/WELL: <u>COOK No.1</u>											
	Footage		Sample Type	Lithology	Formation	Cu	Pb	Zn	Ag					
Assay No.	From	To				Ppm	Ppm	Ppm	Ppm					
22291	760	780	Cuttings			10	640	550	<1					
22292	780	800	"			10	640	360						
22293	800	820	"			10	690	600						
22294	820	840	"			120	110	350						
22295	840	860	"			55	240	350						
22296	860	880	"			40	210	500						
22297	880	900	"			30	290	550						
22298	900	915	"			25	80	600						

ASSAY TECHNIQUE: AMDEL JOB NO. 2373/72

LATITUDE LONGITUDE

BORE HOLE RECORD

INDEX NO.

30° 29' 28" N

129° 55' 47" W

NAME OF BORE/WELL: DENNYMAN NO. 1 WELL

GEOLOGIC AREA : EULIN BASIN

NOTES ON LOCATION :

DATE COMPLETED :

ABBREVIATED LOG :

REFERENCES : D. M. Env. 668.

REMARKS : Cambrian & recent sea incursions, shallow
 water marine.
 757-1500 Redbeds, evaporites.

0-54 Boulder s/s. i. mic.
 54-205 Wilson s/s s/s Chloromitic.
 205-226 Sand-limestone
 226-250 Siltstone, calcitic, argillaceous.
 250-545 Clay, claystone, glauconitic, calc., s/s. Cretaceous.
 545-625 Gravel, coarse. Calc., qtz. Cret?
 625-744 Clay sand pyritic in part. Cret?
 744-957 Sandstone pyritic. (claystone 885-890) Cambrian?
 957-1211 Interbedded shale, siltstone, s/s (glauconitic, pyritic), mic. dol.
 1211-1300 Sand, shale, siltstone, s/s.
 1300-1312 Interbedded siltstone, shale. Dolomitic
 1312-1345 Dolomite → shale.
 1345-1500 Interbedded gypsum, shale, mic. dolomite, siltstone, s/s.

BORE HOLE ASSAYS

			NAME OF BORE/WELL: DENMAN No.1											
Footage		Sample Type	Lithology	Formation	Cu	Pb	Zn	U.						
Assay No.	From				To	Ppm	ppm	ppm	ppm					
22615	1000	1020	Cuttings		5	5	20	1						
22616	1020	1040	"		5	5	20							
22617	1040	1060	"		5	10	25							
22618	1060	1080	"		5	5	40							
22619	1080	1100	"		5	5	40							
22620	1100	1120	"		5	15	35							
22621	1120	1140	"		10	10	45							
22622	1140	1160	"		10	<5	45							
22623	1160	1180	"		10	<5	25							
22624	1193	1200	"		5	5	35							
22625	1200	1220	"		10	30	35							
22626	1220	1240	"		15	5	20							
ASSAY TECHNIQUE: AMDEL JOB NO. 2373/72														

LATITUDE LONGITUDE

BORE HOLE RECORD

INDEX NO.

28°37'15"	132°12'05"	NAME OF BORE/WELL: EMO NO. 1	
-----------	------------	------------------------------	--

GEOLOGIC AREA : OFFICER BASIN
~~STUART SHREE~~

_____ :

_____ :

_____ :

NOTES ON LOCATION :

DATE COMPLETED : EXCEL N.L. 1968

ABBREVIATED LOG : Upper Prot. to 1370' (orig. log).

REFERENCES : DFM Stmt. Bore No. 431.

REMARKS :

0-250 mic. s/s + chert; 250-350 mic. s/s + gray bp. sh. & s/s + siltst. interbed;
 350-450 gray arg. s/s + calc. s/s, chert + siltst; 450-550 arg. s/s &
 chert lenses; 550-910 calc. mic. siltst, 910-960 calc. s/s, siltst, chert;
 960-1090 dolom. s/s + siltst, 1090-1210 dolom. + gyps. siltst.

BORE HOLE ASSAYS

INDEX NO.

			NAME OF BORE/WELL: EMU No.1												
Assay No.	Footage		Sample Type	Lithology	Formation	Cu	Pb	Zn	Ba	Au.					
	From	To				ppm	ppm	ppm	ppm	ppm					
21301	209	219	Core			90	15	60	60	<3					
21302	200	209	Cuttings			80	220	85	100	<3					
21303	ONLY	209	1/2 Circulation Samples			15	20	20	110	<3					
21304	ONLY	209	1/2 Circulation Samples			15	15	85	100	<3					
21305	209	214	Cuttings			90	250	90	70	<3					
21306	214	220	"			20	60	75	70	<3					
21307	220	230	"			5	30	60	80	<3					

ASSAY TECHNIQUE: AMDEL JOB NO. 1800/72 : C1 (Cu, Pb, Zn), B1 (Ba) Au - Semi-quant. Spectro.

Au not detected any sample.

LATITUDE LONGITUDE

BORE HOLE RECORD

INDEX NO.

NAME OF BORE/WELL: EMU FLAT LRWE BORE 1 (221/52)

GEOLOGIC AREA : MARALINGA AREA

_____ :

_____ :

_____ :

NOTES ON LOCATION :DATE COMPLETED :ABBREVIATED LOG : 0-72 (choc. shale) clay with traces of sil
 72-80 sandstone .REFERENCES :REMARKS :

LATITUDE LONGITUDE

BORE HOLE RECORD

INDEX NO.

30° 12'	129° 30' W	NAME OF BORE/WELL: HUGHES NO. 1	
---------	------------	---------------------------------	--

GEOLOGIC AREA : EUCLA BASIN

_____ :

_____ :

_____ :

NOTES ON LOCATION :

DATE COMPLETED :

ABBREVIATED LOG :

REFERENCES : DPM ENV. 668 (Summary of Drilling Logs).

REMARKS : Cambrian 513-1370'. s/s to 853 show red beds, dolom., l/s.
Interp.: recurrent sea invasion, shallow water regime.

0-159 No. 1 bore l/s. 2. fine.
159-338 Wilson Bluffs l/s. white, cream, chalky, friable, brecciated, 1150 Euc. glauconitic, partly recrystallized.
338-361 Sand. carbonaceous, clayey. Euc.
361-650 Clay, claystone, glauconitic, carbonaceous, pyritic. Cret.
650-726. Granite gravel. qtz, anhyd., feldsp. Cret?
726-815 Interbedded clay/claystone. Cret?
815-855 Sandstone Cret?
855-1131 Interbedded clay shale/siltstone/dolomite/gypsum.
1131-1214 Shale H. grey, micac., gypsum.
1214-1370 l/s. dk brown, oolitic.
1370-1370 Shale green, purple, micac., gypsum.

BORE HOLE ASSAYS

151
INDEX NO.

			NAME OF BORE/WELL: HUGHES No.1												
	Footage		Sample Type	Lithology	Formation	Cu	Pb	Zn	Ag						
Assay No.	From	To				ppm	ppm	ppm	ppm						
22552	810	830	Cuttings			20	30	95	<1						
22553	830	850	"			15	20	50							
22554	850	870	"			10	15	60							
22555	870	890	"			5	15	35							
22556	890	910	"			5	10	35							
22557	910	930	"			10	10	60							
22558	930	950	"			10	10	55							
22559	950	970	"			15	10	50							
22560	970	990	"			10	15	55							
22561	990	1010	"			15	10	70							
22562	1010	1030	"			10	10	75							
22563	1030	1050	"			15	10	70							

ASSAY TECHNIQUE: 4AAMDDEL JOB NO. 2373/72

LATITUDE LONGITUDE

BORE HOLE RECORD

INDEX NO.

35° 31' 14"	129° 14' 45"	NAME OF BORE/WELL: HUGHES (NW) NO. 2 WELL	
-------------	--------------	---	--

GEOLOGIC AREA : ECLA BASIN
 _____ :
 _____ :
 _____ :

NOTES ON LOCATION : Miller's Place

DATE COMPLETED :

ABBREVIATED LOG :

REFERENCES : DPM Env. 663.

REMARKS : See Hughes (NE) no. 3 well

0-10 Miller's Place 2. m. loc.
 10-200 Wilson Bluff 2.5 m. loc.
 200-240 Sand loc.
 240-555 Clay, lignite, black, soft & claystone - lignite, gypsum. Cret.
 555-705 (mud. breccia) Cret. anhydrite. Cret.
 705-745 Clay - Sand. white, friable, gypsum. Cret.?
 745-770 Dolomite. Lt. grey, buff, hard, cherty. d. Camb.?

LATITUDE LONGITUDE

BORE HOLE RECORD

INDEX NO.

30° 29' 45"

129° 35' 07"

NAME OF BORE/WELL: HUGHES NO. 3. (NE).

GEOLOGIC AREA : ECUA BASIN

_____ :

_____ :

_____ :

NOTES ON LOCATION :DATE COMPLETED :ABBREVIATED LOG :REFERENCES : DPA EN. 662.REMARKS :

Hughes No 3 (NW) loc at S 30° 31' 44" ; 129° 44' 45" (143-147 : Gray cherty dolomite [li Camb. ?])
 Denman No 1 Well loc at S 30° 29' 20" ; 129° 58' 47" (757-1900 : Red beds, congl., sands, dolomite [Camb. ?]).

0-157 Wellbore H/S glauconitic & claystone interbeds
 157-178 Sandstone, with thin clay sh. sec.
 178-251 Sandstone. Pyritic aggregates, greenish nodules
 251-448 Clay. Carbonaceous, pyritic.
 448-513 Greenish brown. Crat?
 513-535 Claystone (crat?)
 535-570 Sand minor py. Crat?
 570-582 Sandstone
 582-TD. Dolomite, sandstone interbeds } ? li Cambrian.

LATITUDE LONGITUDE

BORE HOLE RECORD

INDEX NO.

29° 57' 15"

151° 39' 15"

NAME OF BORE/WELL: MARALLINGA BORE 5 (42/511)

GEOLOGIC AREA : RUCIA BASIN

_____ :

_____ :

_____ :

NOTES ON LOCATION :DATE COMPLETED : 1-2-54.ABBREVIATED LOG : 0-34 Reddish clay, green clay. Some grit & sand.
34-75 brown & yellow sand, silt, some s.s.?

75-87 yellow s/s

87-100 gritty clay some sandstone bands

100-105 floaters or seams of dark pyritic material

REFERENCES : D.M. 890/50 folder 61-?REMARKS :

140

LATITUDE LONGITUDE

BORE HOLE RECORD

INDEX NO.

30° 10' 00"

131° 36' 10"

NAME OF BORE/WELL: MARALINGA BORE 7 (162/55)

GEOLOGIC AREA : ECUA BASIN

_____ :

_____ :

_____ :

NOTES ON LOCATION :DATE COMPLETED : 12-2-58ABBREVIATED LOG :0-630 red, yellow, orange & cream sands - fine grained, clayey.
sp. 600 yellow & pink sand (clayey). Thin ironstone seams present.REFERENCES : LPM Folder 22/-

600-630 green clay (shale?)

630-940 green shale with congl. & s/s interbeds.

940-1705 chert. shale with minor s/s interbeds.

1705-1731 dk. red quartzite & grey gneiss ← 173.REMARKS :

BORE HOLE ASSAYS

INDEX NO.

			NAME OF BORE/WELL: MARAWINGA BORE 7 (168/55)											
	Footage		Sample Type	Lithology	Formation	Cu	Pb	Zn	U					
Assay No.	From	To				ppm	ppm	ppm	ppm					
22385	650	668	Sludge			75	760	110	2					
22386	669	740	"			25	45	50	NOT ASSAYED					
22387	740	820	"			15	10	590						
22388	820	858	"			10	15	390						
22389		858	"			10	10	280						
22390		878	"			5	10	110						
22391		898	"			5	10	180						
22392		940	"			5	10	220						
22393		980	"			15	20	270						
22394		1000	"			5	10	240						
22395	1020?	1040	"			5	10	280						
22396	1060	1080	"			5	5	270						
ASSAY TECHNIQUE: 1/4 AMDEL JOB NO. 2373/72														

BORE HOLE ASSAYS

			NAME OF BORE/WELL: MARALINGA BORE 7 (168/55)												
	Footage		Sample Type	Lithology	Formation	Cu	Pb	Zn	U						
Assay No.	From	To				Ppm	ppm	ppm	ppm						
22413	1563	1583	Cuttings			5	20	3750							
22414	1583	1603	"			5	15	2150							
22415	1603	1623	"			10	15	3900							
22416	1623	1643	"			10	10	2000							
22417	1643	1663	"			5	10	1450							
22418	1663	1690	"			5	20	1600							
22419	1690	1696	"			5	5	95							
22420	1690	1708	"			5	10	2000							
22421	1708	1715	"			15	5	130							
22422	1715	1721	"			15	10	140	3						

ASSAY TECHNIQUE: AMDEL JOB NO. 2373/72

BORE HOLE ASSAYS

			NAME OF BORE/WELL: MARALINGA BORE 8A (356/60).											
	Footage		Sample Type	Lithology	Formation	Cu	Pb	Zn						
Assay No.	From	To				ppm	ppm	ppm						
22454	90	110	Cuttings			5	5	180						
22455	380	406	"			5	5	85						
22456	400	420	"			5	5	75						
22457	420	440	"			5	5	40						
22458	440	458	"			5	5	25						
22459	458	470	"			5	5	30						
22460	475	507	"			5	5	60						
22461	507	530	"			15	20	360						
22462	530	549	"			15	20	280						
22463	549	—	"			10	10	80						
22464	565	584	"			10	15	180						
22465	584	600	"			15	15	200						
ASSAY TECHNIQUE: AMDEL JOB NO. 2373/72														

LATITUDE LONGITUDE

BORE HOLE RECORD

INDEX NO.

30° 08' 20"

Long 131° 35' 30"

NAME OF BORE/WELL: MURALINGA BORE SH (356/60).

GEOLOGIC AREA : ECKA BASIN

_____ :

_____ :

_____ :

NOTES ON LOCATION :DATE COMPLETED : 1960.

ABBREVIATED LOG : 0-410 red, yellow, cream sand with clay and iron ore.
 410-593 sand with quartzite bands and transition some conglom.
 593-994 shale with sandstone interbeds.

REFERENCES :

fdd. 24 - (356/60) D.N. 600/60

REMARKS :

BORE HOLE ASSAYS

			NAME OF BORE/WELL: MARALINGA BORE 8A (356/60)											
	Footage		Sample Type	Lithology	Formation	Cu	Pb	Zn						
Assay No.	From	To				ppm	ppm	ppm						
22466	600	630	Cuttings			5	5	210						
22467	630	662	"			5	5	220						
22468	662	690	"			5	5	300						
22469	690	720	"			5	5	270						
22470	720	750	"			5	5	720						
22471	750	765	"			5	45	270						
22472	765	795	"			5	45	280						
22473	795	820	"			5	45	180						
22474	820	840	"			5	5	370						
22475	840	860	"			5	5	580						
22476	860	885	"			5	5	410						
22477	885	900	"			5	5	450						
ASSAY TECHNIQUE: AMDEL JOB NO. 2373/72														

LATITUDE LONGITUDE

BORE HOLE RECORD

INDEX NO.

30° 09' 10"

131° 31' 00"

NAME OF BORE/WELL: MARALINGA BORE 113 (192/56)
(2, 14/55)

GEOLOGIC AREA : N. ROLLA PLATEAU

_____ :

_____ :

_____ :

NOTES ON LOCATION :DATE COMPLETED : 19 55/56.
B.S. 29/5/56.ABBREVIATED LOG :REFERENCES : 104M 165/55 (4 279/56?).REMARKS :

0 - 150 clayey sand, traces of ferrug. gr. l
 150 - 153 conglomerate
 153 - 155 s/s; conglomerate
 155 - 163 gritty clay; pyrite nodules; sulphur small.
 163 - 550 sandy clay; conglomerate seams.
 550 - 558 quartzite with pyrite
 558 - 676 sandstone - clayey & gritty in places.
 676 - 730 chert shale - gritty
 730 - 777 sandstone
 777 - 900 sandy shale.

BORE HOLE ASSAYS

INDEX NO.

			NAME OF BORE/WELL: MARALINGA BORE II B (192/56)													
	Footage		Sample Type	Lithology	Formation	Cu	Pb	Zn	U							
Assay No.	From	To				ppm	ppm	ppm	ppm							
22433	6	40	Cuttings			5	5	30								
22434	40	85	"			5	5	10								
22435	85	115	"			5	5	35								
22436	130	170	"			<5	<5	30								
22437	170	200	"			<5	<5	65								
22438	239	260	"			<5	5	45								
22439	260	302	"			<5	<5	35								
22440	302	311	"			<5	<5	50								
22441	420	423	"			<5	50	30								
22442	423	469	"			<5	5	60	30							
22443	469	495	"			<5	25	120								
22444	495	537	"			<5	5	70								
ASSAY TECHNIQUE: AMDEL JOB NO. 2373/72																

LATITUDE LONGITUDE

BORE HOLE RECORD

INDEX NO.

36° 11' 15"

131° 37' 15"

NAME OF BORE/WELL: THIRALINGA BORE 12 (439/53)

GEOLOGIC AREA : N. RICH EXIN

_____ :

_____ :

_____ :

NOTES ON LOCATION :DATE COMPLETED : 10/5/55ABBREVIATED LOG :

0-110 reinterbedded cream & white clayey sand, gritty in places.

110-113 grey, black gritty clay - bands of quartzite

113-165 blue-green shale with chert sh. & brown interbedded sandstone - gritty in part.

REFERENCES :

165-203 off white - brown s/s with many blue-green shale interbeds.

REMARKS :

GREAT ARTESIAN BASIN

DEEP STRATIGRAPHIC BORES

of the

COOPER BASIN AREA.

BETOOTTA NO. 1

DULLINGARI NO. 1

GIDGEALPA NO. 1

GIDGEALPA NO. 3

INNAMINCKA NO. 1

NAPPACOONGEE NO. 1

SPENCER NO. 1

TINGA TINGANA NO. 1

LATITUDE LONGITUDE

BORE HOLE RECORD

INDEX NO.

25°42'30"

146°41'46"

NAME OF BORE/WELL: BETOUTA NO. 1

GEOLOGIC AREA : GREAT ARTESIAN BASIN.
~~COOPER BASIN~~

:

:

:

NOTES ON LOCATION : QueenslandDATE COMPLETED : Delhi-Santos 1959/60?ABBREVIATED LOG : Cret.
Winton form 120-1300 Mic. shale, pyr. siltst.
Tamba " 1300-2040 silty sh., siltst., sls., sls.
Roma 2040-2305 py shale, sls. glauc.
Stiphendale 6p 3205-3451 shaley siltst.
Tmes.REFERENCES :Jurassic
Stiphendale 6p 3451-4196 sls., sh (glau.)
Fossil Wood Beds 4196-4484 sh., siltst.
Woolbaranunda Set. 4484-5000 Sst., + silty sh.
Woolbaran 6p. 5000-5757 py. sst + shale + congl.
Paleozoic 5757-9824 shale, dol., congl. qtzite

D & M Env. 145 & 145A ; SR1/5/45(6) - well comp. Rpt.

D & M Env. Rept. 8k. 658 Ludbrook 1960 - note on sheet.

D & M Env. 21 ; SR1/5/45. - Sign. of Red bed Conglom. J.C. Ryan.

REMARKS : Ludbrook 1960 note section as ? upper part.5757' - marked angular unconformity - conglom./conglomerate. Pebbles of Prec age + to recent granule of non-marine origin. Pebbles sheared.
Env. 21: Sparg: sediments of conglom. from nearby uplifted block - regional N-S fault controlling basin configuration - sels. from mountain range & form a talus slope. Concluded: redbed tectonic conglomerate heavily impregnated with iron oxides.

BORE HOLE ASSAYS

			NAME OF BORE/WELL: BETOOTA No.1											
	Footage		Sample Type	Lithology	Formation	Cu	Pb	Zn	Ag					
Assay No.	From	To				ppm	ppm	ppm	ppm					
22876	5780	5800	Cuttings	Dolomitic + Silty shales	Palaeozoic	15	35	55	<1					
22877	5800	5820	"			10	25	60						
22878	5820	5830	"			10	10	45						
22879	5845	5860	"			15	15	60						
22880	5860	5880	"			15	35	70						
22881	5880	5900	"			10	15	100						
22882	5900	5920	"			10	15	50						
22883	5920	5940	"			10	10	110						
22884	5940	5960	"			15	10	75						
22885	5980	6000	"			10	15	65						
22886	6000	6020	"	10	25	65								
22887	6020	6040	"	25	10	60								

ASSAY TECHNIQUE: 1/4 AMDEL JOB NO.2373/72

BORE HOLE ASSAYS

			NAME OF BORE/WELL: BETOOTA NO.1											
	Footage		Sample Type	Lithology	Formation	Cu	Pb	Zn	Ni	Mn				
Assay No.	From	To				ppm	ppm	ppm	ppm	ppm				
22960	7520	7540	Cuttings			20	65	70	35	710				
22961	7560	7580	"			15	25	85	60	540				
22962	7580	7600	"			10	25	95	25	600				
22963	7600	7620	"			15	25	85	30	530				
22964	7620	7640	"			15	30	85	60	560				
22965	7640	7660	"			20	25	75	40	500				
22966	7660	7680	"			5	20	70	30	530				
22967	7680	7700	"			15	30	75	40	580				
22968	7700	7720	"			25	35	90	80	580				
22969	7720	7740	"			25	35	90	40	630				
22970	7740	7760	"			20	20	90	40	500				
22971	7760	7780	"			25	110	90	55	470				

ASSAY TECHNIQUE: AMDEL JOB NO. 2544/72

BORE HOLE ASSAYS

INDEX NO.

			NAME OF BORE/WELL: BETOOTA No.1											
	Footage		Sample Type	Lithology	Formation	Cu	Pb	Zn	Ni	Mn				
Assay No.	From	To				ppm	ppm	ppm	ppm	ppm				
22972	7780	7800	Cuttings			35	45	95	50	450				
22973	7800	7820	"			45	120	90	30	550				
22974	7820	7840	"			140	65	100	30	490				
22975	7840	7860	"			100	35	100	30	470				
22976	7860	7880	"			130	55	100	30	450				
22977	7880	7900	"			120	50	100	35	470				
22978	7900	7920	"			55	30	95	30	600				
22979	7920	7940	"			50	50	90	30	420				
22980	7940	7960	"			130	60	95	30	410				
22981	7960	7980	"			25	40	90	35	460				
22982	7980	8000	"			45	40	85	35	450				
22983	8000	8020	"			110	75	100	40	560				

ASSAY TECHNIQUE: AMDEL JOB NO.

2544/72

BORE HOLE ASSAYS

INDEX NO.

			NAME OF BORE/WELL: BETOOTA Na1												
Assay No.	Footage		Sample Type	Lithology	Formation	Cu	Pb	Zn	Ni	Mn					
	From	To				ppm	ppm	ppm	ppm	ppm					
22996	8260	8280	Cuttings			25	35	90	30	490					
22997	8280	8300	"			20	25	95	65	560					
22998	8310	8320	"			15	20	95	40	560					
22999	8320	8340	"			10	25	95	30	530					
23000	8340	8360	"			70	70	100	30	610					
23001	8360	8380	"			25	35	100	60	600					
23002	8380	8400	"			15	15	95	35	560					
23003	8400	8420	"			10	15	75	25	630					
23004	8420	8440	"			20	20	75	25	650					
23005	8440	8460	"			25	25	100	200	680					
23006	8460	8480	"			25	15	95	25	750					
23007	8480	8490	"			20	20	75	20	670					

ASSAY TECHNIQUE: AMDEL JOB NO. 2544/72

BORE HOLE ASSAYS

INDEX NO.

			NAME OF BORE/WELL: BETOOTA No.1											
	Footage		Sample Type	Lithology	Formation	Cu	Pb	Zn	Ni	Mn				
Assay No.	From	To				ppm	ppm	ppm	ppm	ppm				
25044	9220	9240	Cuttings			15	20	60	30	820				
25045	9240	9260	"			10	15	65	20	750				
25046	9260	9280	"			50	10	65	10	700				
25047	9280	9300	"			20	30	70	30	840				
25048	9300	9320	"			10	20	75	25	920				
25049	9330	9340	"			20	35	55	20	900				
25050	9340	9360	"			10	15	45	30	870				
25051	9360	9380	"			5	10	45	65	900				
25052	9380	9386	"			10	15	50	30	800				
25053	9410	9420	"			10	45	70	50	910				
25054	9420	9440	"			10	20	75	25	690				
25055	9440	9450	"			10	15	70	30	630				

ASSAY TECHNIQUE: AMDEL JOB NO.

2544/72

BORE HOLE ASSAYS

			NAME OF BORE/WELL: BETOOTA NO.1												
	Footage		Sample Type	Lithology	Formation	Cu	Pb	Zn	Ni	Mn					
Assay No.	From	To				ppm	ppm	ppm	ppm	ppm					
25056	9470	9480	Cuttings			10	15	55	20	720					
25057	9480	9500	"			10	10	55	30	750					
25058	9500	9520	"			10	25	70	25	560					
25059	9520	9540	"			10	65	75	40	520					
25060	9540	9560	"			10	20	65	30	490					
25061	9560	9580	"			20	15	75	30	560					
25062	9580	9590	"			10	10	170	20	620					
25063	9610	9620	"			5	15	140	25	460					
25064	9620	9640	"			25	35	90	30	600					
25065	9640	9660	"			20	35	60	40	560					
25066	9660	9680	"			5	10	55	25	630					
25067	9680	9700	"			5	20	55	25	580					
ASSAY TECHNIQUE: AMDEL JOB NO. 2544/72															

BORE HOLE ASSAYS

INDEX NO.

			NAME OF BORE/WELL: BETOOTA No.1.												
	Footage		Sample Type	Lithology	Formation	Cu	Pb	Zn	Ni	Mn					
Assay No.	From	To				ppm	ppm	ppm	ppm	ppm					
25068	9700	9720	Cuttings			5	10	55	25	620					
25069	9720	9740	"			20	35	65	25	630					
25070	9740	9760	"			5	15	55	30	550					
25071	9760	9780	"			5	15	90	25	550					
25072	9780	9800	"			5	5	65	25	580					
25073	9812	9824	Cove 12			5	20	65	25	550					
ASSAY TECHNIQUE: AMDEL JOB NO. 2544/72															

LATITUDE LONGITUDE

BORE HOLE RECORD

INDEX NO.

28° 07' 55"

110° 52' 30"

NAME OF BORE/WELL: DULLINGARI NO. 1.

GEOLOGIC AREA : COOPER BASIN

:

:

:

NOTES ON LOCATION :DATE COMPLETED : DelhiABBREVIATED LOG : see above.REFERENCES : D. H. ENV. 258 ; SR 11/5/76/1REMARKS : Ordovician (Lower to Middle) 9050' - 11464'.

C-488 Quat. & Tert. [Q 0-160 sand & silt
T 160-448 carb. shale & interbedded s/s].

488-2549 Winton form. Silty carb. shale & interbedded s/s;
(L. Cret.) some thin s/s bands.

2549-3538 Tambo form. Grey shale & interbeds silt + s/s + ls.
(L. Cret.)

3538-4492 Roma form. Silty pyritic shale & interbedded
(L. Cret.) glauconitic s/s.

4492-4774 Transition Beds s/s, in part glauconitic, interbedded
(L. Cret.) shale.

4774-5792 Mooga (Rhyolite s/s) s/s (conglomeratic), minor shale.
(U. Jurassic)

5792-6182 Wooloon Form. s/s (congl.), minor shale.
(L. Jur.)

6182-6707 Triassic (L. Triassic) s/s & interbedded siltstone.

6707-7296 Permian congl. s/s & interbedded shale.

7296-7524 " shale

7524-7718 " s/s & interbedded shale

7718-7926 " shale & minor siltstone.

7926-8930 " s/s + silty shale.

8930-9050 " Boulder clay.

9050-9668 Ordovician calc - dolomitic pyritic shale

9668-9814 dolomitic shale - siltstone, pyritic

9814-11464 pyritic dolomitic - calc. shale. thin
beds of dol. siltstone.

11464-11588 shale (as above) with pyritic sandstone.

LATITUDE LONGITUDE

BORE HOLE RECORD

INDEX NO.

27°56' 116"

110°04'55.9"

NAME OF BORE/WELL: GIDGEALPA NO. 1

GEOLOGIC AREA : COOPER BASIN

_____ :

_____ :

_____ :

NOTES ON LOCATION :DATE COMPLETED : Delhi-Santos

Quart-Tert. 0-748 ; Cret. 748-5450 ; Jur. 5450-7185 ; Triassic 7185-7690 ; Pal. undiff. 7690-9110'.

ABBREVIATED LOG : 11000' - 10000' THRUST FAULT 11000' shale, dolom, agglomerate 10000 - 13114'.REFERENCES : DPM Env. 363

Dept. Int. Dev. BMR Pet. Search Sub. Act. Publication 73. - 1966.

REMARKS :

BORE HOLE ASSAYS

			NAME OF BORE/WELL: CIDGEALPA No.1											
	Footage		Sample Type	Lithology	Formation	Cu	Pb	Zn	Ni	Ba.				
Assay No.	From	To				ppm	ppm	ppm	ppm	ppm				
22066	9100	9150	Cuttings	Pyritic Limestones, Silty laminated Shales (fossils) Shale, Vols. Agglom Tuffaceous Limestone		15	50	100	25	110				
22067	9150	9200	"		20	20	280	30	120					
22068	9200	9250	"		20	15	150	20	140					
22069	9250	9300	"		25	15	100	25	140					
22070	9300	9350	"		25	10	70	25	120					
22071	9350	9400	"		20	15	85	30	110					
22072	9400	9450	"		30 Core 12	10 12	200 9415-9425	60 included	120					
22073	9450	9500	"		35	5	380	75	100					
22074	9500	9550	"		25	15	110	40	80					
22075	9550	9600	"		15	10	85	25	90					
22076	9600	9650	"	Limestone + Shales	15	5	110	35	110					
22077	9650	9700	"		15	10	110	25	100					
ASSAY TECHNIQUE: AMDEL JOB NO. 1800/72 C1 (Cu,Pb,Zn,Ni) B1 (Ba).														

BORE HOLE ASSAYS

			NAME OF BORE/WELL: GIDGEALPA No. 1											
	Footage		Sample Type	Lithology	Formation	Cu	Pb	Zn	Ni	Ba				
Assay No.	From	To				Ppm	ppm	ppm	ppm	ppm				
22078	9700	9750	Cuttings	Limestone & Shales	Mid Cambrian	15	15	100	25	130				
22079	9750	9800	"	Shale,		15	15	100	20	130				
22080	9800	9850	"	tuffaceous s/s + pyr.		35	20	240	30	190	Core 13, 9798-9808 inch.			
22081	9850	9900	"			25	20	140	30	160				
22082	9900	9950	"			25	10	140	40	140				
22083	9950	10000	"		25	25	190	40	130	Core 14, 9984-9999 included.				
22084	10050	10100	"		U-M Cambrian	40	25	280	30	140				
22085	10100	10150	"			25	20	130	30	140				
22086	10150	10200	"	Dark grey, calc., pyritic shale		35	35	220	40	190				
22087	10200	10250	"			35	20	110	40	160				
22088	10250	10300	"			40	15	190	50	170				
22089	10300	10350	"		35	15	130	40	170	Core 15, 10280-10290 incl.				
ASSAY TECHNIQUE: AMDEL JOB NO. 1500/72 C1 (Cu, Pb, Zn, Ni) B1 (Ba) [X-Ray fl. spec.]														

BORE HOLE ASSAYS

INDEX NO.

			NAME OF BORE/WELL: GIDGEALPA No.1.													
	Footage		Sample Type	Lithology	Formation	Cu	Pb	Zn	V	W	Mo	Be				
Assay No.	From	To				ppm	ppm	ppm	ppm	ppm	ppm	ppm				
22126	12,100	12,150	Cuttings	limestone + interlaminae of calc. bitum(?) Shale ↓ Shale, limestone, dolomite ↓ dolomite with agglomerate towards base	Mid Cambrian	30	10	100	100	x	x	5				
22127	12,150	12,200	"			30	15	90	80	x	x	5				
22128	12,200	12,250	"			40	15	80	80	x	x	5				
22129	12,250	12,300	"			30	10	100	80	x	x	3				
22130	12300	12350	"			20	10	75	60	x	x	5				
22131	12,350	12400	"			20	5	60	80	x	x	3				
22132	12400	12450	"			20	10	75	80	x	x	3				
22133	12450	12500	"			15	10	70	30	x	x	3				
22134	12500	12550	"			15	10	70	20	x	x	5				
22135	12550	12600	"			15	20	75	20	x	x	3				
22136	12600	12650	"	core 25, 12605 - 12615 included												
				30	30	120	100	x	x	3						
22137	12650	12700	"	20	30	85	30	x	x	3						
ASSAY TECHNIQUE: AMDEL JOB NO. 1800/72 C1 (Cu, Pb, Zn.) V, W, Mo, Be Semi Quant.																

			NAME OF BORE/WELL: GIDGEALPA No. 1													
	Footage		Sample Type	Lithology	Formation	Cu	Pb	Zn	V	W	Mo	Be				
Assay No.	From	To				ppm	ppm	ppm	ppm	ppm	ppm	ppm				
22138	12700	12750	Cuttings	dolomite with agglomerate towards base	Mid. Cambrian	Core 26; 30	12740 - 12750 included. 25	180	20	x	x	1				
22139	12750	12800	"			35	35	180	20	x	x	1				
22140	12800	12850	"			35	20	250	20	x	x	1				
22141	12850	12900	"			15	20	150	10	x	x	1				
22142	12900	12950	"			15	20	150	10	x	x	1				
22143	12950	13000	"			Core 29; 15	12950 - 12960 included. 25	80	10	x	x	1				
22144	13000	13050	"	agglomerate		10	30	70	10	x	x	1				
22145	13050	13114	"	agglomerate		20	55	100	20	x	x	1				
22146																
22147																
22148																
22149																

ASSAY TECHNIQUE:	AMDEL JOB NO.	1800/72	CI (Cu, Pb, Zn); V, W, Mo, Be, Semi Quant.
------------------	---------------	---------	--

LATITUDE LONGITUDE

BORE HOLE RECORD

INDEX NO.

27°58'27.1"S

140°03'05"E

NAME OF BORE/WELL: GIDGEALPA NO. 3.

GEOLOGIC AREA : COOPER BASIN

:

:

:

NOTES ON LOCATION :DATE COMPLETED : Delhi-SantosABBREVIATED LOG :REFERENCES : DPM Env. 395 ; SR11/5/13v.REMARKS : Cambrian (?) 7642' - 7745' Erosion breccia; clay → dol. s/s.

Proterozoic (?) 7745' - 10934' Tuff, conglom. tuff, tuffaceous shale.

10450 - 10934 trachyte.

red-brown; orange and brown anhedral phenocrysts of felspar and mafic minerals in a cryptocrystalline ground mass. Coarse calcite veins.

Recent-Tert. 0-639 q/sand, clay. 535-555 arenaceous s/s

Winton form. (Cenomanian) 639-3064. Mainly grey carb. shale.
Poorly sorted lignitic sst. few bands of grey-brown s/s.
Occasional lignite bands.Tambo form. (Albian) 3064-4050. Grey, qtz. fissile, bentonitic,
micronaceous shale with sandst. & siltstone interbeds.Toolebuc Member, Tamb form. (Albian) 4050-4176.
Grey, glauconitic sst and slightly calc. shale.Roma form. (Aptian) 4176-4564. Mainly dk. grey fissile
silty shale with numerous interbeds of glauconitic sst.

Transition Beds (Aptian-Neocomian) 4564-5103. Lt. grey

Magn Sandstone (U-Turassic) sandst. with kaolin cement and dk. grey fissile, silty shale.
5103-6010Waloon form. (U-M Jurassic) 6010-6425. Carbonaceous,
silty shale. Minor interbeds of fissile carb. shale; few coal bands.Hutton Sandstone Equiv. (M-L Jurassic) 6425-6790.
Interbeds of carb. shale, coal bands common.Lower Tertiary. 6790-7038. Lt. grey argill. sst with pebbles
of red siltstone and carb. shale.Permian 7037-7560 Poorly sorted sst. with kaolin cement
7560-7697. Conglomerate - cobble pebbles, grains of
red tuff, reddish dolomite and chert in
dk grey-green carbonaceous matrix. Carb.
shale with dolomite and trachyte fragments.Cambrian (?) 7697-7745. Erosion breccia of white chert and qtz
fragments in st. calc. clay matrix grading to grey dolomites
with minor tuff.

BORE HOLE ASSAYS

			NAME OF BORE/WELL: GIDGEALPA No.3										
Footage		Sample Type	Lithology	Formation	Cu	Pb	Zn						
Assay No.	From				To	ppm	ppm	ppm					
22728	7930	7955	Cuttings	Tuff.	Prot.?	5	10	55					
22729	7955	7970	"	Conglom. tuff.		5	5	55					
22730	7970	7990	"	tuff. shale.		5	5	55					
22731	7990	8010	"			5	5	35					
22732	8010	8030	"			5	5	45					
22733	8030	8050	"			5	10	40					
22734	8050	8073	"			5	5	130					
22735	8068	8090	"			10	15	120					
22736	8068	8076	CORE			5	5	15					
22737	8090	8110	Cuttings			5	5	25					
22738	8110	8130	"		10	10	30						
22739	8130	8150	"		90	15	85						
ASSAY TECHNIQUE: AMDEL JOB NO. 2373/72													

BORE HOLE ASSAYS

			NAME OF BORE/WELL: GIDGEALPA No.3											
	Footage		Sample Type	Lithology	Formation	Cu	Pb	Zn						
Assay No.	From	To				ppm	ppm	ppm						
22740	8150	8170	Cuttings	Tuff, Conglom.	Prot.?	10	5	70						
22741	8170	8190	"	Tuff, Tuffae.		15	20	60						
22742	8190	8210	"	Shale.		10	5	15						
22743	8210	8230	"			10	15	140						
22744	8230	8250	"			10	5	35						
22745	8250	8270	"			5	5	15						
22746	8270	8290	"			5	5	50						
22747	8290	8310	"			15	15	45						
22748	8310	8330	"			10	20	35						
22749	8330	8350	"			10	15	60						
22750	8350	8370	"			5	5	100						
22751	8370	8390	"			5	5	30						

ASSAY TECHNIQUE:	AMDEL JOB NO.	2373/72
------------------	---------------	---------

			NAME OF BORE/WELL: GIDGEALPA No. 3											
	Footage		Sample Type	Lithology	Formation	Cu	Pb	Zn						
Assay No.	From	To				ppm	ppm	ppm						
22752	8390	8410	Cuttings	Tuff, Conglom, Prot.? tuff, tuffac. Shale		5	5	30						
22753	8410	8430	"			5	5	75						
22754	8430	8450	"			10	10	35						
22755	8450	8470	"			10	10	95						
22756	8470	8490	"			10	20	160						
22757	8490	8510	"			5	10	25						
22758	8510	8520	"			10	10	95						
22759	8530	8550	"			5	5	35						
22760	8550	8570	"			5	10	230						
22761	8590	8610	"			5	15	100						
22762	8610	8630	"	5	5	25								
22763	8630	8650	"	5	5	30								
ASSAY TECHNIQUE: AMDEL JOB NO. 2373/72														

BORE HOLE ASSAYS

INDEX NO.

			NAME OF BORE/WELL: GIDGEALPA No.3											
	Footage		Sample Type	Lithology	Formation	Cu	Pb	Zn						
Assay No.	From	To				Ppm	Ppm	Ppm.						
22788	9140	9160	Curtines	Tuff conglom. tuff, tuffaceous Shale	Prot.?	5	5	50						
22789	9160	9180	"			10	20	310						
22790	9180	9200	"			35	5	55						
22791	9200	9220	"			25	5	40						
22792	9220	9240	"			15	10	90						
22793	9240	9260	"			5	5	25						
22794	9260	9280	"			15	5	30						
22795	9280	9300	"			3300	25	2450						
22796	9300	9320	"			1400	5	720						
22797	9320	9340	"			870	5	380						
22798	9340	9360	"	220	5	65								
22799	9360	9380	"	100	5	95								
ASSAY TECHNIQUE: AMDEL JOB NO. 2373/72														

BORE HOLE ASSAYS

			NAME OF BORE/WELL: CIDGEALPA No. 3												
	Footage		Sample Type	Lithology	Formation	Cu	Pb	Zn	Ag						
Assay No.	From	To				ppm	ppm	ppm	ppm.						
22812	9620	9640	Cuttings	Tuff, tuffaceous Conglom. tuffac. shale	Prot. (?)	15	5	90	<1						
22813	9640	9660	"			10	5	80							
22814	9660	9680	"			15	5	120							
22815	9680	9700	"			170	<5	80							
22816	9700	9720	"			10	<5	90							
22817	9720	9740	"			25	5	45							
22818	9740	9760	"			600	130	550							
22819	9760	9780	"			25	5	45							
22820	9780	9800	"			20	5	50							
22821	9800	9820	"			5	5	45							
22822	9820	9840	"	30	5	45									
22823	9840	9860	"	60	10	80									
ASSAY TECHNIQUE: 1/8 AMDEL JOB NO. 2373/72															

BORE HOLE ASSAYS

INDEX NO.

			NAME OF BORE/WELL: GIDGEALPA No.3												
	Footage		Sample Type	Lithology	Formation	Cu	Pb	Zn	Ag						
Assay No.	From	To				ppm	ppm	ppm	ppm						
22848	10340	10360	Cuttings	Tuff	Prot.(?)	15	5	75	41						
22849	10360	10380	"	Conglom		30	5	75							
22850	10380	10400	"	Tuff,		40	10	140							
22851	10400	10420	"	Tuff-shale		20	5	130							
22852	10420	10440	"			50	5	55							
22853	10440	10460	"			35	10	100							
22854	10460	10480	"			15	55	80							
22855	10480	10530	"	TRACHYTE		5	5	40							
22856	10530	10580	"			10	45	25							
22857	10580	10630	"			15	5	140							
22858	10630	10680	"			5	5	60							
22859	10680	10730	"			5	5	60							

ASSAY TECHNIQUE: A/A	AMDEL JOB NO. 2373/72
----------------------	-----------------------

			NAME OF BORE/WELL: GIDGEALPA No. 3.													
	Footage		Sample Type	Lithology	Formation	Cu	Pb	Zn	Ag	Ba	Ba					
Assay No.	From	To				ppm	ppm	ppm	ppm	ppm	%					
22860	10730	10780	Cuttings	Trachyte	Prot. (?)	5	<5	60	<1							
22861	10780	10830	"			<5	<5	45								
22862	10830	10880	"			<5	<5	50								
22863	10880	10934	"			5	<5	65								
22864	9735	9745	Core 11			Conglom. Sulphide in vein	10	10	100		250					
22865	10151	10155	Core 12			Tuff ?	5	10	85		250					
22866	8572	8582	Core 9			Conglom.	5	<5	35			0.03				
22867	9195	9161	Core 10			Conglom.	5	5	50			0.025				
22868	7690	7696	Core 6 Congl. (+ sulph.)			Erosion breccia	30	80	140			0.01				
22869	8068	8076	Core 7 Conglom. ?			+ tuff. Conglom.	10	20	45			0.03				
22870	8524	8530	Core 8 Conglom. ?	tuff. tuffae. Shale.	5	<5	10			0.05						

ASSAY TECHNIQUE: 1/4 AMDEL JOB NO. 2373/72

and conformable with the folds in the limestone; whilst the silty layers between are apparently undisturbed.

This evidence of pre-consolidation features is of interest, particularly since similar evidence is seen in the Dullingari Palaeozoic section (especially Core 26).

The layers of indurated micaceous siltstone are slightly coarser-grained equivalents of the slates more commonly seen in other cores (Dullingari, Orientos). Conformable layers of pyrite, as minute euhedral crystals, are present and probably syngenetic. Variable amounts of calcite are present in the silty layers, though the transition to limestone layers is fairly abrupt.

The limestone layers are even-grained, and contain finely-divided carbonaceous and detrital matter. Small pyrite euhedra are also seen. A few small patches suggest the former presence of fossils, and one area is suggestive of the cross-section of a bi-valve fossil. (TS12816).

Core No. 12. 9415-9425 feet (Middle Cambrian)

9417 feet

This is a tuffaceous siltstone composed predominantly of fine-grained chlorite, sericite, feldspar, quartz and carbonate. The rock is finely laminated and shows current bedding structures. Several thin fractures which cut the rock cause displacement of the laminae. Grey-green laminae contain abundant sericite and chlorite whilst the lighter laminae, which commonly lens out, contain abundant quartz and feldspar or abundant carbonate. Quartz and feldspar (mostly plagioclase) are usually very angular in shape - often lath- or shard-like. (TS12817).

9419 feet 6 inches

This is a fossiliferous limestone which contains abundant, small fossil fragments. The surrounding carbonate is generally fine- to medium-grained. The fossil fragments themselves are now composed predominantly of carbonate which is often coarser-grained than the surrounding carbonate matrix and have tests which are thin walled and siliceous. Palaeontological examination would be required for their identification. (TS12847).

9420 feet

This is a banded tuffaceous limestone. Generally the bands contain either fine-grained volcanic material or carbonate as major constituents. A short description of the prominent bands of this section of core is given below.

1. Green band at base - fine- to medium-grained plagioclase (albite) laths in a fine-grained groundmass of plagioclase and chlorite. Occasionally coarser plagioclase grains are

present and generally the plagioclase is sericitised. Some chlorite occurs as round vesicle-like aggregates. Sphene (leucoxene) is abundant.

2. Pinkish band - coarse-grained carbonate with scattered euhedral pyrite grains. Some finer-grained patches of carbonate occur.
3. Greenish band - this grades from the coarse carbonate and consists of alternating bands of fine-grained carbonate and volcanic material with occasional large aggregates of feldspar laths and abundant, fine-grained aggregates of sphene (leucoxene).
4. Grey-white band - this is comprised of carbonate and volcanic material with abundant aggregates, 1 to 2 mm in diameter, of entirely volcanic material distributed throughout the band. Chlorite is not abundant, but large angular feldspar grains occur.
5. Greenish-white band - this is carbonate with incorporated volcanic fragments. The plagioclase laths are generally larger than those in the previous bands and the fragments are darker containing abundant chlorite and sphene (leucoxene).
6. White band - coarse-grained carbonate.
7. Dark green band at top - volcanic material incorporating large irregular carbonate aggregates and a few coarse feldspar fragments.
(TS12818-12820)

9423 feet

This is a tuffaceous limestone which is petrologically quite similar to one of the bands (band 4) described from this core at 9420 feet. Volcanic fragments up to several millimetres in diameter are embedded in a calcite matrix. There is a general increase in the size of the fragments towards the bottom of the core. Overall calcite is more abundant than the volcanic material. Plagioclase laths and chlorite are the predominant constituents of the volcanic fragments. (TS12831-3)

Core No. 13. 9798-9808 feet (Middle Cambrian)

9803 feet

This is a brecciated, laminated slate. The laminae are at an angle of approximately 75° to the core axis and alternate laminae are distinguished by an abundance of argillaceous minerals or silt-sized quartz and feldspar grains. Sericite and muscovite are abundant argillaceous

minerals. A strong slaty cleavage which has developed from the foliation of the micas is parallel to the lamination. A carbonate mineral fills the fractures in the slate. Fine pyrite grains occur throughout. (TS12844).

Core No. 14. 9989-9999 feet (Middle Cambrian)

9994 feet

This is a finely laminated slate. Mineralogically it is quite similar to the slate from 9803 feet. Structurally, a slaty cleavage has developed parallel to the laminations but there is no intense brecciation of this rock as in Core 13. The laminae lie at approximately right angles to the length of the core. (TS12846).

Core No. 15. 10,280-10,290 feet (Middle Cambrian)

10,281 feet

This is a laminated slate which possibly shows more brecciation than Core 13. Again a carbonate mineral fills the fractures. Lighter coloured laminae in the slate are richer in calcite than the darker laminae. The laminae overall lie at approximately 40° to the length of the core. The prominent slaty cleavage is parallel to the laminations.

Mineralogically these three cores are very similar. The only differences that exist appear to be in the attitude of the bedding and the degree of brecciation. Cores 13 and 15 are more brecciated than Core 14. Assuming the holes are vertical, the dip of the bedding in Core 15 is greater than in Cores 13 and 14. (TS12845).

a. Comparison with Cores 26-30, Dullingari

Cores 13, 14 and 15 are more directly comparable to Core 27 than to the other cores from Dullingari. Core 27 is a siltstone which has undergone slight metamorphism (less than 13, 14 or 15). However the slaty cleavage is parallel to the bedding.

Core 28 consists of interlaminated coarser and finer material, the finer being similar to Core 27. Core 29 is a conglomerate and thus not similar. Cores 30 and 31 are slates of similar appearance but the slaty cleavage shown by them is at an angle of $10-15^{\circ}$ to the bedding.

b. Identification of carbonate mineral in limey laminae

The light-coloured material was removed and subjected to X-ray diffraction analysis. The carbonate mineral present is calcite.

Core No. 16. 10,488-10,498 feet (Middle Cambrian)10,494½ feet

This is a tuffaceous limestone similar in appearance to those observed in previous cores. Carbonate and volcanic fragments are present in approximately equal amounts. In thin section the volcanic fragments are observed to have more irregular boundaries and to be more altered than previously. Most have been converted to aggregates of chlorite, cryptocrystalline silica, sericite, quartz and opaques (sphene and/or leucoxene) with only the original shape of the feldspar laths preserved. Carbonate present is probably calcite and occurs with cryptocrystalline silica and sericite as irregular aggregates surrounding or replacing the volcanic fragments. The rock is cut by numerous, irregular fractures containing abundant cryptocrystalline silica. (TS12908)

Core No. 17. 10,828-10,838 feet (Middle Cambrian)10,837 feet

This is a tuffaceous limestone in which rounded volcanic fragments are set in fine- to medium-grained calcite. The volcanic fragments are dark coloured and most of the original constituents have been replaced by carbonate and/or cryptocrystalline silica. The fragments themselves now show spherical and arcuate structures which have probably formed as a result of the replacement. Dark coloured bands are finer-grained - mostly silt-sized grains - and consist predominantly of carbonate, quartz opaques and scattered sericite flakes. The banding is caused by the abundance of fine opaques in some laminae. Several arcuate fossil fragments, similar to those seen in Core No. 12, were observed in some carbonate-rich areas. (TS12911)

Core No. 18. 11,068-11,078 feet (Middle Cambrian)11,072 feet

This is a well-laminated, extremely altered volcanic tuff. Altered fine-grained feldspars, aggregates of carbonate and sphene (leucoxene?) are scattered through a fine-grained chloritic or cryptocrystalline silica groundmass. The laminae can be distinguished easily because they are rich in one or another of the constituents. Spherical or arcuate structures which are abundant throughout the groundmass are outlined by fine opaques or sphene around aggregates of chlorite or silica. These structures have most probably been produced during recrystallization and alteration but could possibly represent structures in an original glassy matrix since devitrified. The carbonate aggregates may represent replacement of the rock by carbonate or may have been rock fragments. Portion of the rock is brecciated and the fractures have been filled by coarser-grained, milky-white carbonate. (TS12912-13)

Core No. 19. 11,366-11,391 feet (Middle Cambrian)11,378 feet

This is a completely altered medium-grained igneous rock which shows a sub-ophitic texture. Originally laths of plagioclase, ferromagnesian grains and opakes were the predominant constituents. Apatite and sphene are abundant accessories. Now, however, plagioclase has been almost completely replaced by calcite, ferromagnesian have altered to aggregates of chlorite or antigorite and opakes have altered to sphene. Antigorite aggregates probably represent original olivine. Some chlorite aggregates have pyroxene or amphibole outlines. Coarse aggregates of potash feldspar (probably microcline) occur throughout the rock. These appear as vesicle-like or vein-like aggregates which are late-stage alteration products similar to the calcite.

The texture and probable mineral composition of this rock indicate that it is most likely an altered microdiorite or microgabbro. If the body has sill-like field relationships microdiorite would be the better name. (TS12917).

11,378½ feet

This specimen is an intraformational or pelletoid conglomerate. Rather irregular or rounded lenticular fragments of argillaceous limestone are surrounded by a slightly more argillaceous, banded and also fine-grained matrix. Fine opakes impart a fine banding to the matrix. The minerals present are calcite, quartz, sericite, and chlorite. (TS12918).

Core No. 20. 11,391-11,407 feet (Middle Cambrian)11,391 feet

This is a fine-grained laminated limestone. Calcite is the predominant constituent. Silt-sized quartz, sericite and fine opakes occur in minor amount. Calcite-rich bands are commonly rather lenticular in shape. Darker bands which alternate with these show very fine laminations, are more argillaceous and contain abundant fine opakes (mainly iron oxide). (TS12919).

Core No. 21. 11,675-11,719 feet (Middle Cambrian)11,683 feet

This is a highly-calcareous, indurated, layered siltstone with carbonaceous matter and finely-divided pyrite, alternating with much paler, fine-grained limestone.

Re-crystallization of the calcite has given rise to more coarsely-crystalline patches and cross-cutting veinlets. The core differs very little from Core 20; the silty layers of Core 21 are wider and more prominent. (TS12982).

11,684½ feet

This is a silty, micaceous, fine-grained limestone. Carbonaceous and pyritic matter occurs in some layers, and may even be quite abundant in some of the dark, glassy-looking layers with splintery fracture. Heating tests on this material confirm the presence of iron sulphides and carbon.

Secondary, coarsely-crystalline calcite occurs along bedding-planes and as small veinlets. (TS11983)

11,688½ feet

This section is of particular interest in that it contains an intraformational conglomerate. The constituent pebbles and matrix show clear evidence of plastic deformation, indicating that they were still soft or semi-consolidated at the time of deposition. It may be recalled that in the Dullingari section (Core No. 29) similar conditions existed, except that the fossiliferous limestone pebble components were fully consolidated, and indeed abraded, at the time of deposition. The existence of the fossiliferous limestone section at Gidgealpa is welcome evidence in support of the original theory that, at Dullingari, the influx of the limestone pebbles may have "triggered off" the sliding movements responsible for the intraformational conglomerate. The age-relationships of the two sections (Lower Ordovician of Dullingari and Middle Cambrian of Gidgealpa) appear to fit in well with the general picture.

The conglomerate is composed of deformed fragments of limestone, both fossiliferous and oolitic, and of calcareous fragments of fossils, in a dark, carbonaceous and sulphidic, silty, calcareous matrix. The matrix was subjected to heating tests, but no petroliferous or bituminous odours could be detected.

Other thin-sections of this core show the silty limestone and more carbonaceous, pyritic layers, very similar to sections at 11,683-11,684 feet. (TS11984-5-6)

Core No. 22. 12,021-12,031 feet (Middle Cambrian)

A well-indurated, argillaceous, micaceous siltstone, showing some graded bedding. The grain size ranges from very fine silt to coarse silt and some layers are predominantly argillaceous; the individual flakes of micaceous minerals all show parallel alignment, giving rise to mass optical effects.

Granular calcite is present in layers, but is not nearly as abundant as in previous cores. (TS12987)

Core No. 23. 12,239-12,264 feet (Middle Cambrian)12,240 feet

This may be termed a calcitized crystal-tuff. The rock consists predominantly of well-defined, fresh laths and angular fragments of sodic plagioclase (oligoclase to albite). The crystals occur as individuals and also as aggregates with interstitial opaque white or cryptocrystalline colourless material. Little or no quartz is visible, and the tuff is of an "intermediate" rather than "acid" or "basic" nature; the rock fragments may best be described as trachytic.

The interstitial and cementing material which is probably calcite, appears to be of late-stage or secondary origin, though it may be recrystallized penecontemporaneous material. (TS12990).

12,248 feet

This section consists of alternating fossiliferous limestone and carbonaceous, pyritic siltstone and sandstone.

The limestone contains numerous fossil-fragments, often consisting of cryptocrystalline silica, set in recrystallized calcite. The siltstone-sandstone is strongly tuffaceous, containing many fragments and crystals of completely altered feldspar, and grading into a tuff.

There has been a marked steepening of the dip in Core 23, a trend which is noticeable in Core 22 also, compared with Core 21.

Some of the limestone was dissolved in dilute hydrochloric acid; the residue contained many siliceous casts of trilobite fragments. (TS12991).

Core No. 24. 12,605-12,615 feet (Middle Cambrian)12,608 feet

This is a well-laminated, conspicuously layered fine-sand grade rock. Well-marked carbonaceous layers and partings occur, and these are highly fossiliferous layers of limestone.

The bulk of this core section consists of abundant muscovite laths, angular fragments of quartz and feldspar, and recrystallized calcite; carbonaceous matter is conspicuous in some layers, commonly finer-grained. The rock may be termed a calcitic, micaceous, laminated, fine-grained sandstone, with fossil layers. (TS1300-3).

Core No. 27. 12,773-12,783 feet (Middle Cambrian).12,773 feet

The rock is composed entirely of dolomite, as fine- to coarsely-crystalline aggregates. Brecciation of the rock was followed by crystallization of coarse rhombohedra of dolomite with iron-staining, causing the fragments to "heal"

12,773 feet (Cont'd)

together. There is no evidence of bituminous material in interstices; isolated grains of pyrite were seen. (TS13001).

Core No. 29. 12,950-12,960 feet (Middle Cambrian)12,950 feet

This is a coarsely-crystalline dolomite, similar to a marble; the term marble, however, cannot be used unless there is definite evidence of formation under metamorphic conditions. Such evidence is lacking here, and recrystallization of the dolomite is diagenetic. Small breccia zones traverse the rock and show iron-staining as well as recrystallization of dolomite to form large rhombohedra. This core is very similar to Core 27. (TS13020).

Core No. 30. 13,106-13,113 feet (Middle Cambrian)

This entire core section consists of bedded agglomerates and lapilli-tuffs.

There is evidence that at least some of the volcanic fragments solidified "in flight", as they have chilled margins. The core is generally unsorted, containing 5 cm diameter fragments side-by-side with 2 to 3 mm fragments. However, in places some sorting has occurred.

The rock fragments are all highly vesicular and extensively altered, and accurate classification is not possible. Some altered feldspar phenocrysts are recognisable, and the rocks are in the intermediate to acid range of compositions. Post-depositional alteration has been severe. Silica, sericite and pale chlorite have filled vesicles and completely replaced phenocrysts. Interstices between pyroclastic fragments have been lined with the same minerals and filled with coarsely crystalline calcite.

It appears that from Core 12 to Core 30, there is a thick sequence of intercalated pyroclastic and more normal shales, silts and limestones with fossiliferous horizons. On present evidence, it appears that all the pyroclastics have a common origin, and that they assume increasing importance lower in the sequence. (TS13010-13013)."

PART BCore No. 10. 9052-9062 feet (Pre-Permian)

This is a white quartz sandstone with calcareous cement and with spheroidal pyrite concretions 6-10 mm in diameter. The quartz grains are angular. No fossils are recognizable and none can be expected. There is no evidence for dating. If the heavy mineral suite of the Permian is well known, an attempt could be made to obtain heavy minerals from the sandstone for comparison, and if they prove to be different, an Ordovician age of the sandstone could be considered possible.

Core No. 11. 9140-9150 feet (Middle Cambrian)

This is a black impure nodular pyritic limestone and calcareous shale with fragmentary fossils. A sample was treated with monochloroacetic acid and the insoluble residue was found to contain numerous well-preserved shells of the Brachiopod Acrotreta sp. (Cambrian-Ordovician). As the species of this genus are considered to be confused and requiring revision, specific identification was not attempted. A fragmentary agnostid trilobite and various other trilobite fragments were seen in the matrix.

Core No. 13. 9800 feet (Middle Cambrian)

A dark pyritic shale. On the sectioned core the dip is clearly 30° . The rock is distinctly laminated with minor crossbedding. It is also fractured with almost complete calcite cementation of fractures. No fossils were seen.

Core No. 16. 10,492.5-10,493 feet (Middle Cambrian)

As seen in hand specimen the rock consists of irregularly shaped, angular, dense, dark green fragments in a fine grained, light grey matrix. The fragments range in size from 0.6 cm to less than a pin-head in diameter. Fragments and matrix each constitute approximately 50% of the rock volume. The matrix effervesces very, very slowly with cold dilute HCl.

In thin section the "fragments" show as ragged patches consisting of a pale green chloritic base throughout which are scattered lath- and diamond-shaped pseudomorphs up to 0.25 mm long presumably after feldspar, and scattered ragged granules, 0.02-0.07 mm diameter, after ilmenite. The feldspar has altered to a fine sericitic aggregate, and the ilmenite to leucoxene. X-ray examination suggests that the leucoxene is possibly anatase, and that some feldspar (plagioclase) is still present as such.

The refractive index Alpha-Beta - 1.611 of the chloritic base is not irreconcilable with the mineral amesite which X-rays indicate is the most likely chloritic type.

In several "fragments" are spherulitic aggregates, 0.1 mm diameter, of probable colourless mica (R.I. less than R.I. chlorite); ellipsoidal spherulites in a few other "fragments" are of chlorite. The latter certainly are a development of the crystallizing secondary product; whether the "mica" spherulites also are a secondary development or whether they are amygdales in originally vesicular lava is uncertain.

The rock matrix is a carbonate, probably dolomite as indicated by the reticent effervescence with acid. Rhombohedral cleavage is apparent in places. Interrupting the continuity of the carbonate are (in addition to the chloritic "fragments") ill-defined patches of quartz and some sericitic mica. The origin of this quartz and sericite is uncertain; some of the quartz may be derived from the breakdown of original ferromagnesian minerals (e.g. pyroxene) to the chlorite; the sericite may represent original clay.

The whole rock is decidedly "messy", due to considerable alteration of the original constituents and some mobilization of the alteration products.

The rock appears to have been a basic lapilli tuff the fragments of which have settled into soft carbonate sediment on the sea floor.

The rock can be interpreted as an altered submarine lithic tuff deposited by volcanic eruption in an environment of carbonate sedimentation. The absence of sorting or grading is difficult to understand and could indicate violent disturbance of sediment by volcanic action with rapid settling of a carbonate-tuff slurry. A full interpretation from a single borehole is impossible, as expected lateral changes (to pure tuff or a graded bed or a pillow lava or an agglomerate vent) cannot be observed. In the absence of bore log data indicating faulting a repetition of this lithology would indicate a repetition of the volcanic event.

Permian: 6,686-6,868 feet

Thickness: 182 feet

Interbedded light grey, fine to very coarse grained and conglomeratic, angular to subround, poorly sorted, friable quartz sandstone with kaolin cement, boulders up to 5" diameter and dark grey to black, fissile, micaceous and very carbonaceous; coal. Good porosity, oil staining, fluorescence and cut with carbon tetrachloride in the following zones: 6,756-6,779 feet, 6,792-6,809 feet, 6,830-6,842 feet and 6,857-6,868 feet.

Early Paleozoic or Proterozoic: 6,868-9,020 feet

Thickness: 2,152 feet

6,868-7,400 feet: Grey, green and maroon, very fine to very coarse grained, angular to subround, tuff, sandy and friable at top becoming harder downward, consisting of rock fragments, feldspar laths, chert pebbles, chlorite and calcite; thin interbeds of tan, microcrystalline, tight dolomite.

7,400-8,600 feet (approximately): Tuff at top grading to brown to tan, aphanitic, chloritic rhyolite, then to chocolate brown and orange porphyritic trachyte containing large feldspar phenocrysts, ferromagnesian minerals and trace of magnetite and sphalerite(?); calcite and quartz veins common.

8,600-9,020 feet: Chocolate brown and orange, very coarse grained, tuffaceous trachyte containing angular blocks up to 4" across of trachyte in a groundmass of trachytic lava; large feldspar phenocrysts and ferromagnesian minerals common. Calcite, chlorite and epidote veins common.

3. STRUCTURE

As Gidgealpa No. 2 well is slightly less than two miles away from the No. 1 well, the general Gidgealpa structure will not be discussed here, as it has already been detailed in the report on Delhi-Santos Gidgealpa No. 1 to which the reader is referred. Only new structural evidence arising from the drilling of the second well will be discussed here.

Dips from cores taken in the Mesozoic and Permian are essentially horizontal. Continuous dipmeter results within the same formations are quite erratic in both dip value and dip direction and are, no doubt, reflecting cross bedding, a condition common within these strata. Any true dip within the Mesozoic and Permian rocks should be less than in the same strata in Gidgealpa No. 1, where dips of 5° to 10° were recorded. The angular unconformity at the base of the Permian is well demonstrated both by core dips and dipmeter values. The first core taken in Pre-Permian rocks shows reliable dips of 18° to 20° (6,890 feet). With increasing depth the dip increases

STRATIGRAPHIC TABLE

Gidgall p. no. 233 (cont. p. 234). page 10

AGE	GROUP	FORMATION	DEPTH FEET	SUBSEA ELEVATION FEET	THICK- NESS FEET
			Kelly Bushings	+181	
Recent & Tertiary			Surface	+165	734
Upper Cretaceous		Winton	748	-567	2,609
Lower Cretaceous	Rolling Downs	Tambo	3,357	-3,176	1,005
Lower Cretaceous	Rolling Downs	Toolebuc Member of Tambo	4,362	-4,181	115
Lower Cretaceous	Rolling Downs	Roma	4,477	-4,296	734
Lower Cretaceous	Blythesdale	Transition Beds	5,211	-5,030	239
Upper Jurassic	Blythesdale	Mooga Sandstone	5,450	-5,269	922
Upper to Middle Jurassic		Walloon	6,372	-6,191	408
Middle to Lower Jurassic		Hutton Sandstone (Equiv.)	6,780	-6,599	405
		Hiatus			
Lower Triassic		Un-named	7,185	-7,004	505
Permian		Un-named	7,690	-7,509	1,000
		Angular Unconformity?			
Paleozoic undiffer- entiated		Sandstone Unit Un-named	8,690	-8,509	420
		Angular Unconformity			
Upper and Middle Cambrian		Un-named	9,110	-8,929	4,004
Total Depth			13,114	-12,933	

2. STRATIGRAPHY

The stratigraphic succession found in Delhi-Santos Gidgealpa No. 1 is described below. Naming of the Mesozoic units follows the revised correlation system described in the well completion report for Delhi-Santos Pandieburra No. 1. Spores, lithology and correlation with Innamincka No. 1 and Dullingari No. 1 wells were all used to determine the boundaries of the Permian unit. The Upper and Middle Cambrian age of the sequence below 9110 feet was determined paleontologically. Doubt exists concerning the age of the sandstone unit below the Permian and above the known Middle Cambrian as no fossils were found in it. This unit is more akin to the Cambrian than the Permian as there is evidence of angularity with erosion between the sandstone unit and the Permian, whereas between the sandstone and the underlying Middle Cambrian rocks there is little evidence of erosion and slight angular discordance. The age of this unit is probably Upper Cambrian or Lower Ordovician, but for purposes of this report and until definite evidence comes to hand, it is designated as "Paleozoic undifferentiated".

Recent and Tertiary. Surface to 748 feetThickness: 748 feet

Unconsolidated tan to white iron stained medium to coarse grained sand, soft yellow-buff clay, light grey mudstone and poorly consolidated, white, medium to very coarse grained quartz sandstone, usually water bearing. At 600 feet, distinctive white soft arenaceous limestone.

Winton Formation (Cenomanian). 748-3357 feetThickness: 2609 feet

Light grey, very soft, silty, carbonaceous shale with interbeds of "salt and pepper", fine to coarse grained, angular to subangular, poorly sorted, soft, carbonaceous, tight, sandstone with argillaceous but occasionally calcareous matrix. Sandstone increases in prominence toward base. Occasional thin bands of lignite. Few thin bands of grey-brown microcrystalline limestone.

Tambo Formation (Albian). 3357-4362 feetThickness: 1005 feet

Mainly grey, fissile, soft micromicaceous, slightly silty, bentonitic shale with minor interbeds of grey, soft siltstone, and rare bands of brown microcrystalline limestone. Pelecypod fragments and Inoceramus prisms abundant throughout.

Toolebuc Member, Tambo Formation (Albian). 4362-4477 feet

Thickness: 115 feet

Grey, fissile, silty shale and dark brown carbonaceous(?) shale. Minor grey slightly calcareous siltstone. Rare fish scales and spines.

Roma Formation (Aptian). 4477-5211 feet

Thickness: 734 feet

Dark grey, fissile, micromicaceous, in part silty shale with minor interbeds of grey-green, fine to medium grained, subangular, shaly, very glauconitic sandstone. Occasional thin bands of light brown arenaceous micro-crystalline limestone. Pelecypod and Inoceramus prisms common.

Transition Beds (Aptian-Neocomian). 5211-5450 feet

Thickness: 239 feet

Light grey to white, fine to coarse grained, angular to subrounded, carbonaceous, tight to poorly porous sandstone with kaolin cement. Minor interbeds of dark grey, fissile, micaceous, carbonaceous shale.

Mooga Sandstone (Upper Jurassic). 5450-6372 feet

Thickness: 922 feet

5450-5610 feet: brown-grey, fine to very fine grained, micaceous, argillaceous, carbonaceous, very poorly porous sandstone with interbeds of dark grey, fissile, micaceous, carbonaceous shale.

5610-6372 feet: predominantly white, fine to very coarse grained, occasionally conglomeratic, angular to subangular, poorly sorted, poorly consolidated, clear quartz sandstone with good porosity. Minor interbeds of dark grey, fissile, micaceous, carbonaceous shale.

Walloon Formation (Upper to Middle Jurassic). 6372-6780 feet

Thickness: 408 feet

6372-6462 feet: brown to grey, fissile, silty, carbonaceous shale and minor interbeds of white, very fine to fine grained, carbonaceous shaly sandstone.

6462-6780 feet: white, fine to very coarse grained, in part conglomeratic, poorly sorted, angular to subrounded, carbonaceous quartz sandstone with kaolin cement and good

porosity. Occasional pink garnets. Minor interbeds of dark grey, fissile, micaceous, carbonaceous shale.

Hutton Sandstone (Equivalent) (Middle to Lower Jurassic).
6780-7185 feet

Thickness: 405 feet

White, light brown near base, fine to coarse grained, in part conglomeratic, angular to subangular, poorly sorted, fairly porous quartz sandstone with kaolin and siliceous cement. Minor interbeds of dark grey, fissile, micaceous, carbonaceous shale. At base of unit trace of rounded granules of red-brown siltstone.

Lower Triassic. 7185-7690 feet

Thickness: 505 feet

White, light grey to light brown, very fine grained, rarely coarse grained, angular to subrounded, poorly sorted, micaceous, slightly dolomitic, tight, quartz sandstone with argillaceous cement, trace of glauconite and tiny red-brown patches of ferruginous material throughout. Very minor thin beds and laminae of dark grey, fissile, micaceous, slightly carbonaceous shale.

Permian. 7690-8690 feet

Thickness: 1000 feet

White, grey and light brown, fine to very coarse grained, angular to subangular, poorly sorted, slightly carbonaceous, quartz sandstone, generally tight but with several zones of low porosity. Common interbeds of dark grey to black fissile, micaceous, very carbonaceous shale with abundant plant fossils. Coal seams numerous, up to 15 feet thick.

Paleozoic undifferentiated. 8690-9110 feet

Thickness: 420 feet

White, very fine to coarse grained, subangular to rounded, fairly well sorted quartz sandstone with mainly calcareous but some kaolinitic and siliceous cement; grains of rose quartz and garnet common, pyrite and glauconite rare; occasional white chert pebbles; tiny carbonaceous(?) specks throughout; tight except for poor porosity in top 50 feet. Very minor thin bands of mid-grey, silty, pyritic, micaceous, slightly carbonaceous(?) shale.

Middle Cambrian. 9110-10,000? feet

Thickness: 890 feet

9110-9390 feet: interbedded pale to mid-grey, micro-crystalline to saccharoidal, pyritic, argillaceous to silty, laminated, hard, tight limestone and dark grey to black, fissile, laminated pyritic, very calcareous shale. Trilobites and brachiopods common throughout.

9390-9535 feet: intermixed grey-green, hard, calcareous, tuffaceous shale; conglomerate of volcanic rock fragments and tuffaceous sandstone and irregular bands of grey, coarsely crystalline, tuffaceous, fossiliferous limestone.

9535-9780 feet: interbedded limestone and shale as for 9110-9390 feet.

9780-9900 feet: interlaminated dark grey to black, fissile, micaceous, slightly calcareous shale and grey-green, hard, tuffaceous, slightly calcareous siltstone.

9900-10,000 feet: grey-green, fine to coarse grained, angular, tuffaceous, calcareous, tight sandstone with minor dark grey, fissile, slightly calcareous, pyritic shale.

Upper passing down to Middle Cambrian. 10,000?-13,114 feet

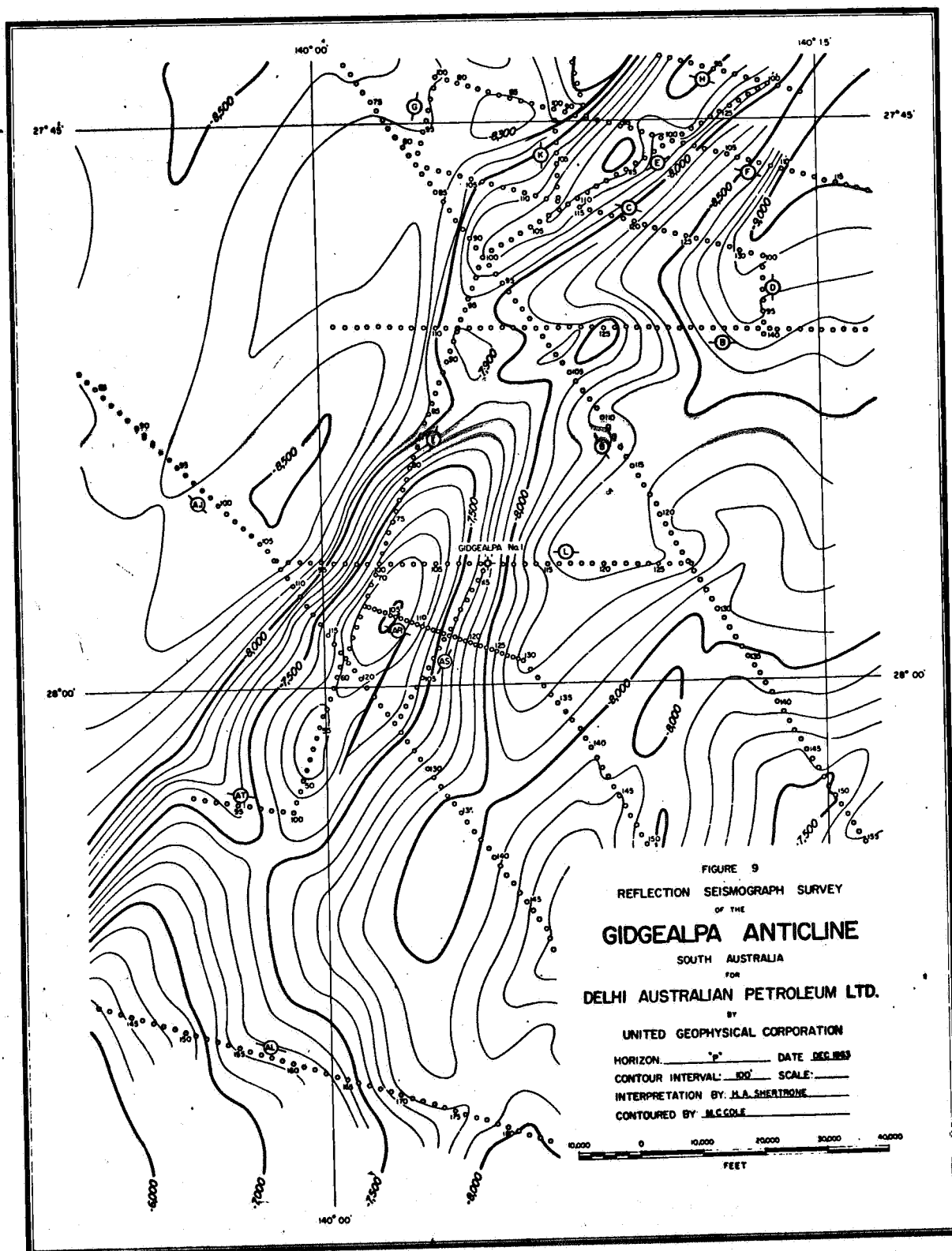
Thickness: 3114 feet

10,000-10,435 feet: dark grey, hard, fissile, brittle, finely laminated, micromicaceous, slightly calcareous, pyritic, slightly silty shale with very minor dark grey, shaly limestone.

10,435-11,040 feet: grey-green, massive, tuffaceous limestone to calcareous agglomerate composed of sub-rounded blocks of up to 1/2" across of partly kaolinised volcanic rock in calcareous to dolomitic, finely to microcrystalline matrix.

11,040-11,270 feet: mottled grey-green and cream agglomerate of volcanic rock fragments embedded in a matrix of volcanic ash, fine sandstone and finely crystalline calcite.

11,270-11,880 feet: thickly interbedded grey, micro-crystalline, slightly dolomitic, pyritic, arenaceous and slightly tuffaceous limestone; dark grey, slightly calcareous, micromicaceous, pyritic, fissile, brittle shale; mottled grey-green and white agglomerate of volcanic rock fragments in matrix of calcareous volcanic ash.



11,880-12,200 feet: grey to grey-green, hard, brittle fissile, micromicaceous, slightly calcareous, pyritic shale and minor interlaminae of pale grey-green, microcrystalline to granular, hard, very shaly, slightly dolomitic, tight limestone.

12,200-12,575 feet: dark grey, medium to coarsely crystalline, silty, fossiliferous, argillaceous, slightly dolomitic, tight limestone and minor interlaminae of black, hard, fissile, silty, calcareous, bituminous(?) shale.

12,575-12,670 feet: interbedded pale grey, micromicaceous, fissile, calcareous shale; black, fissile, slightly calcareous, bituminous(?), fossiliferous shale; grey, coarsely crystalline, pyritic, very fossiliferous, tight limestone.

12,670-13,100 feet: cream, grey, pink and red breccia of dolomite blocks up to 2" across cemented with fine to very coarsely crystalline dolomite; good vughy, intercrystalline and fracture porosity; faint dull gold fluorescence in vughs, faint pale yellow cut, trace dead oil stain. Bottom 70 feet dark grey, fine to coarsely crystalline, argillaceous, pyritic, mainly tight, bedded dolomite.

13,100-13,114 feet: grey-green and brown agglomerate of angular to subround fragments of volcanic rock up to 3" across and cherty, fossiliferous, dolomite pebbles cemented by dolomite.

3. STRUCTURE

Delhi-Santos Gidgealpa No. 1 well was drilled down the flank of a strongly developed northeast-southwest trending anticline, one of a group of similar structures occurring in the west Strzelecki Creek area outlined by reconnaissance seismic methods. The Gidgealpa structure itself is 12 miles long by $3\frac{1}{2}$ miles wide within the lowest closing contour on the 'P' seismic horizon and has a vertical closure in excess of 700 feet on that horizon (see Figure 9). The well is located approximately $3\frac{1}{4}$ miles east-northeast of the highest point on the structure and 1340 feet structurally below the crest of the structure on the 'P' horizon contour map (approximate top of Permian). From this map the anticline appears asymmetrical, the west limb being much steeper than the eastern one. Dips on the 'Pre-P' events, shown on the profile section along the line 'L' of the seismic survey, are approximately the same on either flank being of the order of 20° to 25° .

Dips from cores taken in the Mesozoic sequence are horizontal. Continuous dipmeter results over roughly the same interval show dips of 5° to 10° in an easterly

LATITUDE LONGITUDE

BORE HOLE RECORD

INDEX NO.

27° 29' 21.3"	114° 55' 07.7"	NAME OF BORE/WELL: INNAMINCKA NO. 1	
---------------	----------------	-------------------------------------	--

GEOLOGIC AREA : ~~GREAT ARTESIAN BASIN~~
COOPER BASIN
LOOPER BASIN

NOTES ON LOCATION :

DATE COMPLETED : Delhi - France - Santos 1960

ABBREVIATED LOG :

REFERENCES : DPM Env. 146 ; SR 11/5/36

REMARKS : Dev (?) Red beds pyr. s/s 7030-7050
pyr. dol. siltst. 7050-7080.
T.D. of Hole 12633.

230-1795 Winton form Equiv. Carbonaceous, grey, green mudstones, grey, f.g. siltstones, some pyritic, carb. sandstones. Traces of H. grey, dense limestone; leached red siltstone to 260'.
1795-2770 Tambo form. Equiv. (Cret.; Albian), mudstone, siltst., shales.
2770-3928 Roma form. Equiv. (" Aptian) shales (min. py)
3928-4665 U. Rhyolite 6p Equiv.? (" Neocomian) carb., silty sand
4665-5148 L. " " ? (U. Jurassic) sandst., shale.
5148-5437 Wadoodi Coal Mev. Equiv.? (M. Jur?) carb. shales.
5437-5938 Marburg form. Equiv. (L. Jur?) silt + shale.
5938-6070 Bundamba 6p Equiv.? (Triassic?) dolom. silt + red shales.
6070-6123 Moolyember Shale Equiv.? (") grey dolom. carb. shale, micaceous; micaceous silt. with coal streaks to 690', sand, feldspathic, pyritic in part.
7050-12637 Devonian?
Alternating thin beds of black red mudstones and shales, calcareous sandstones. Sandstones are glauconitic, occasionally micaceous, shales cross-bedded and gypsiferous.

Innamincka hor Delhi 1965 Lat 27° 29' 08' long 114° 03' 30" E
TD 11763
Core 13 Carboniferous (?) 11760-11761 silty, micaceous, glauconitic.

LATITUDE LONGITUDE

BORE HOLE RECORD

INDEX NO.

28° 01' 56"

140° 41' 41"

NAME OF BORE/WELL: NAPPACONSEE NO. 1.

GEOLOGIC AREA : COOPER BASIN

_____ :

_____ :

_____ :

NOTES ON LOCATION : Between Gidgealpa hole and Dollingari hole.DATE COMPLETED : Santos 1966.ABBREVIATED LOG :REFERENCES : DPM Env. 555.REMARKS : Ordovician 6864'-9874' Unnamed formation.

BORE HOLE ASSAYS

INDEX NO.

			NAME OF BORE/WELL: NAPPACOONGEE No. 1											
	Footage		Sample Type	Lithology	Formation	Cu	Pb	Zn						
Assay No.	From	To				ppm	ppm	ppm						
22352	6692	6712	Core 3	silt stone, dip 60-70%?		40	85	110						
22353	6997	7012	Core 4	Siltstone + shale		65	45	510						
22354	7012	7031	"			90	55	160						
22355	7371	7377	Core 5	Shale + s/s dolomitic, pyritic		40	5	75						
22356	7663	7676	Core 6	"		45	25	140						
22357	7676	7686	"	"		45	30	150						
22358	7688	7697	"	"		45	45	130						
22359	8619	8630	Core 8	Shale + pyrite clusters		35	25	100						
22360	9864	9874	Core 9	"		40	110	150						

ASSAY TECHNIQUE: AMDEL JOB NO.

2373/72

LATITUDE LONGITUDE

BORE HOLE RECORD

INDEX NO.

28° 10' 11" S

139° 52' 02" E

NAME OF BORE/WELL:

SPENCER NO. 1

GEOLOGIC AREA : COOPER BASIN

_____ :

_____ :

_____ :

NOTES ON LOCATION :DATE COMPLETED : Delhi Australia Petroleum 1966.ABBREVIATED LOG : (see notes below)REFERENCES : DTM Env. 558

REMARKS : Sample 6612' - rhyolite conglom. - no sulphides
 Appears to be 100% pyroclastic material, some flow material, oxidised mineral after magnetite rather than pyrite.
 Spencer #1 Cut Camb./Pre Camb. v. obs. 6626' - 6752' (132')

BORE HOLE ASSAYS

INDEX NO.

			NAME OF BORE/WELL: TINGA - TINGANA No. 1.											
Footage		Sample Type	Lithology	Formation	Cu	Pb	Zn	Ag						
Assay No.	From				To	ppm	ppm	ppm	ppm					
22543	6194	6208	Core 6	green + brown s/s + grit	Pre-Permian	5	5	50	<1					
22544	6208	6214	"	green + brown siltstone + s/s		10	5	110						
22545	6535	6547	Core 7	white + green s/s		<5	5	75						
22546	6547	6560	"	Sandstone + siltstone		5	5	55						
22547	6560	6572	"	green + white s/s + siltstone		<5	10	110						
22548	6572	6576	"	s/s		<5	20	160						
22549	6871	6881	Core 8	well sorted conglom. - basement boulders		10	5	170						
22550	7242	7436	Core 9	mudstone + conglom.		20	15	95						
22551	7547	7552	Core 10	s/s + conglom.		15	20	40						

ASSAY TECHNIQUE: $\frac{A}{A}$ AMDEL JOB NO. 2373/72

GREAT ARTESIAN BASIN

FROME EMBAYMENT

DELHI - SANTOS STRATIGRAPHIC BORES

LAKE FROME No.1

LAKE FROME No.2

LAKE FROME No.3

BORE HOLE ASSAYS

INDEX NO.

			NAME OF BORE/WELL: LAKE FROME No.1												
Assay No.	Footage		Sample Type	Lithology	Formation	Cu	Pb	Zn	Ni	Mn					
	From	To				Ppm	Ppm	Ppm	Ppm	Ppm					
25074	530	550	Cuttings			10	15	95	15	230					
25075	550	570				5	20	95	15	130					
25076	570	590				5	<5	40	10	55					
25077	590	610				20	15	65	20	360					
25078	610	630				470	1250	2900	40	1700					
25079	630	650				55	30	240	25	690					
25080	650	670				5	5	100	5	270					
25081	670	690				25	20	110	15	350					
25082	690	710				1400	150	780	40	370					
25083	710	730				25	40	510	10	240					
25084	730	750				30	30	380	20	400					
25085	750	770				30	45	290	25	450					
ASSAY TECHNIQUE: AMDEL JOB NO.			2544/72												

* NOTE : All ^{cuttings} samples are unreliable because of known Zn contamination

BORE HOLE ASSAYS

			NAME OF BORE/WELL: LAKE FROME No. 1												
	Footage		Sample Type	Lithology	Formation	Cu	Pb	Zn	Ni	Mn					
Assay No.	From	To				ppm	ppm	ppm	ppm	ppm					
25098	1010	1030	Cuttings			20	35	160	25	550					
25099	1030	1050				10	35	410	25	520					
25100	1050	1070				140	150	300	30	620					
25101	1070	1090				55	60	280	25	630					
25102	1090	1110				60	60	230	30	650					
25103	1110	1130				50	60	360	25	600					
25104	1140	1150				20	40	190	35	610					
25105	1150	1170				30	50	410	25	530					
25106	1170	1190				35	65	530	30	500					
25107	1190	1210				45	60	310	30	600					
25108	1210	1230				30	100	160	30	610					
25109	1230	1250				30	80	540	25	580					
ASSAY TECHNIQUE: AMDEL JOB NO. 2544/72															

BORE HOLE ASSAYS

INDEX NO.

			NAME OF BORE/WELL: LAKE FROME No.1											
	Footage		Sample Type	Lithology	Formation	Cu	Pb	Zn	Ni	Mn				
Assay No.	From	To				ppm	ppm	ppm	ppm	ppm				
25110	1250	1270	Cuttings			20	45	360	25	470				
25111	1270	1290				25	90	6900	20	400				
25112	1290	1310				10	55	4400	20	410				
25113	1310	1330				5	25	420	20	350				
25114	1330	1350				10	25	770	25	400				
25115	1350	1370				5	30	220	25	360				
25116	1370	1390				10	35	1200	25	430				
25117	1390	1410				10	20	500	20	490				
25118	1410	1430				25	40	510	20	490				
25119	1430	1450				10	50	450	15	380				
25120	1450	1470				5	10	140	20	310				
25121	1470	1490				10	30	3800	30	380				

ASSAY TECHNIQUE:	AMDEL	JOB NO.	2544/72
------------------	-------	---------	---------

BORE HOLE ASSAYS

			NAME OF BORE/WELL: LAKE FROME No. 1											
	Footage		Sample Type	Lithology	Formation	Cu	Pb	Zn	Ni	Mn				
Assay No.	From	To				ppm	ppm	ppm	ppm	ppm				
25122	1490	1500	Cuttings			10	25	960	20	500				
25123	1510	1530				5	40	190	20	460				
25124	1530	1550				10	30	540	20	460				
25125	1550	1570				10	30	280	20	420				
25126	1570	1590				10	45	880	15	410				
25127	1590	1610				5	25	440	25	410				
25128	1610	1630				5	10	160	40	420				
25129	1630	1650				5	10	1800	20	550				
25130	1650	1670				110	130	2800	25	1400				
25131	1670	1690				100	35	2700	30	900				
25132	1690	1710				10	45	1200	30	550				
25133	1710	1730				10	80	1700	50	470				

ASSAY TECHNIQUE: AMDEL JOB NO. 2544/72

BORE HOLE ASSAYS

			NAME OF BORE/WELL: LAKE FROME No.1.											
Assay No.	Footage		Sample Type	Lithology	Formation	Cu	Pb	Zn	Ni	Mn				
	From	To				ppm	ppm	ppm	ppm	ppm				
25158	2210	2230	Cuttings			5	10	240	25	540				
25159	2230	2250				5	5	170	30	560				
25160	2250	2270				5	10	580	30	580				
25161	2270	2290				5	20	560	40	600				
25162	2290	2310				5	10	430	40	690				
25163	2310	2330				5	20	2600	30	690				
25164	2330	2350				15	20	1100	70	630				
25165	2350	2370				10	30	3500	40	670				
25166	2370	2390				10	25	1900	40	580				
25167	2390	2410				5	25	1100	40	580				
25168	2410	2430				5	10	720	40	690				
25169	2430	2450				5	25	1900	40	660				

ASSAY TECHNIQUE: AMDEL JOB NO. 2544/72

BORE HOLE ASSAYS

INDEX NO.

			NAME OF BORE/WELL: LAKE FROME I.											
Assay No.	Footage		Sample Type	Lithology	Formation	Cu	Pb	Zn ⁸	Mn					
	From	To				ppm	ppm	ppm	ppm					
25327	697	710	Cone 1			25	<5	95	540					
25328	1124	1134	✓ 2			5	50	60	330					
25329	1278	1288	✓ 3			45	<5	45	360					
25330	1288	1298	✓			15	5	100	370					
25331	1485	1495	✓ 4			25	5	75	380					
25332	1663	1674	✓ 5			310	<5	95	1800					
25333	2088	2098	✓ 6			5	5	160	510					
25334	2557	2565	✓ 7			5	10	300	570					

ASSAY TECHNIQUE: AMDEL JOB NO.

2544/72

Note: Reliable results. No contamination

BORE HOLE ASSAYS

INDEX NO.

			NAME OF BORE/WELL: LAKE FROME No. 2												
	Footage		Sample Type	Lithology	Formation	Cu	Pb	Zn *	Ni	Mn					
Assay No.	From	To				ppm	ppm	ppm	ppm	ppm					
25175	550	570	Cuttings			25	15	50	<5	310					
25176	570	590				30	30	60	5	250					
25177	600	610				10	25	70	5	240					
25178	610	630				15	10	90	5	190					
25179	630	650				10	20	70	10	240					
25180	650	670				<5	10	65	5	200					
25181	670	690				5	20	85	5	250					
25182	690	710				5	15	90	5	210					
25183	710	730				5	<5	70	5	230					
25184	730	750				5	10	75	5	330					
25185	750	770				5	<5	60	15	290					
25186	770	790				5	5	65	5	280					
ASSAY TECHNIQUE: AMDEL JOB NO. 2544/72															

NOTE: All cuttings samples are unreliable because of known zinc contamination

			NAME OF BORE/WELL: LAKE FROME No 2												
	Footage		Sample Type	Lithology	Formation	Cu	Pb	Zn	Ni	Mn					
Assay No.	From	To				ppm	ppm	ppm	ppm	ppm					
25187	790	810	Cuttings			5	10	85	5	190					
25188	810	830				10	10	65	10	230					
25189	830	850				15	10	230	15	170					
25190	850	870				5	10	95	15	280					
25191	870	890				40	130	100	15	280					
25192	890	910				15	40	200	25	440					
25193	910	930				150	15	200	15	390					
25194	930	950				100	10	85	20	430					
25195	950	970				100	70	120	20	1400					
25196	970	990				5	5	85	20	380					
25197	990	1010				15	10	110	15	340					
25198	1010	1030				35	50	190	35	430					

ASSAY TECHNIQUE: AMDEL JOB NO.

2544/72

BORE HOLE ASSAYS

$$2544 \overline{) 172}$$

BORE HOLE ASSAYS

INDEX NO.

			NAME OF BORE/WELL: LAKE FROME No.2											
	Footage		Sample Type	Lithology	Formation	Cu	Pb	Zn	Ni	Mn				
Assay No.	From	To				ppm	ppm	ppm	ppm	ppm				
25211	1270	1290	Cuttings			95	30	65	20	760				
25212	1290	1310				5	10	85	25	560				
25213	1310	1330				5	10	340	25	500				
25214	1330	1350				15	15	100	25	540				
25215	1350	1370				25	190	1400	20	560				
25216	1370	1390				15	40	790	20	570				
25217	1390	1410				15	10	240	25	520				
25218	1410	1430				15	10	60	20	620				
25219	1430	1450				15	5	330	20	520				
25220	1450	1470				45	90	300	20	630				
25221	1470	1490				40	20	1300	20	520				
25222	1490	1510				20	120	430	20	450				
ASSAY TECHNIQUE: AMDEL JOB NO. 2544/72														

BORE HOLE ASSAYS

INDEX NO.

			NAME OF BORE/WELL: LAKE FROME No. 2											
	Footage		Sample Type	Lithology	Formation	Cu	Pb	Zn	Ni	Mn				
Assay No.	From	To				ppm	ppm	ppm	ppm	ppm				
25223	1510	1530	Cuttings			5	15	95	35	670				
25224	1530	1550				5	20	85	25	730				
25225	1560	1570				5	30	170	20	620				
25226	1570	1590				5	30	670	25	620				
25227	1590	1610				<5	20	120	15	450				
25228	1610	1630				5	25	150	20	260				
25229	1630	1650				5	20	310	15	300				
25230	1650	1670				5	20	390	15	320				
25231	1670	1690				5	20	300	15	430				
25232	1690	1710				15	35	910	20	410				
25233	1710	1730				170	210	1300	15	620				
25234	1730	1750				15	55	1200	15	380				

ASSAY TECHNIQUE: AMDEL JOB NO. 2544/72

BORE HOLE ASSAYS

			NAME OF BORE/WELL: LAKE FROME No.2												
	Footage		Sample Type	Lithology	Formation	Cu	Pb	Zn	Ni	Mn					
Assay No.	From	To				ppm	ppm	ppm	ppm	ppm					
25247	1990	2010	Cuttings			25	110	3400	20	570					
25248	2010	2030		25	75	4900	20	520							
25249	2030	2050		20	65	2700	20	450							
25250	2050	2070		15	30	670	20	430							
25251	2070	2090		15	45	980	20	470							
25252	2090	2110		15	80	2100	20	680							
25253	2110	2130		180	55	910	25	490							
25254	2130	2150		15	60	920	20	480							
25255	2150	2170		20	40	690	25	440							
25256	2170	2190		75	55	1000	20	470							
25257	2190	2210		15	30	700	20	500							
25258	2210	2230	5	5	290	15	440								
ASSAY TECHNIQUE: AMDEL JOB NO. 2544/72															

BORE HOLE ASSAYS

INDEX NO.

			NAME OF BORE/WELL: LAKE FROME No 2											
Assay No.	Footage		Sample Type	Lithology	Formation	Cu	Pb	Zn ⁸	Mn					
	From	To				ppm	ppm	ppm	ppm					
25319	1484	1493	Core 4			5	<5	110	690					
25320	1493	1501	"			<5	10	95	520					
25321	1501	1509	"			<5	10	95	540					
25322	1723	1727.3	Core 5			5	5	110	640					
25323	2024	2041	Core 6			15	20	110	360					
25324	2399	2409	Core 7			<5	10	95	300					
25325	2515	2521	Core 8			5	15	100	500					
25326	2521	2530	"			<5	15	85	590					

ASSAY TECHNIQUE: AMDEL JOB NO.

2544/72

X NOTE: Reliable results. No contamination

BORE HOLE ASSAYS

INDEX NO.

			NAME OF BORE/WELL: LAKE FROME 3											
Assay No.	Footage		Sample Type	Lithology	Formation	Cu	Pb	Zn ⁸	Ni	Mn				
	From	To				ppm	ppm	ppm	ppm	ppm				
25273	580	600	Cuttings			15	45	470	25	1100				
25274	600	620				15	140	950	25	840				
25275	640	660				15	65	510	25	1100				
25276	660	680				15	30	610	25	980				
25277	680	700				15	35	1200	25	890				
25278	700	720				15	80	1300	25	1100				
25279	720	740				25	120	1500	25	1100				
25280	740	760				15	40	150	15	560				
25281	760	780				10	200	6700	20	760				
25282	764	774	Cone			5	10	85	15	560				
25283	780	800	Cuttings			5	15	140	10	300				
25284	800	820	"			5	20	95	10	430				
ASSAY TECHNIQUE: AMDEL JOB NO. 2544/72														

Note: All cutting samples are suspect for known zinc contamination.

BORE HOLE ASSAYS

270

INDEX NO.

			NAME OF BORE/WELL: LAKE FROME No 3												
	Footage		Sample Type	Lithology	Formation	Cu	Pb	Zn	Ni	Mn					
Assay No.	From	To				ppm	ppm	ppm	ppm	ppm					
25285	820	840	Cuttings			5	40	170	15	590					
25286	840	860		5	25	140	15	380							
25287	860	880		5	20	120	15	510							
25288	880	900		5	35	130	20	4200							
25289	900	920		5	40	110	25	2600							
25290	920	940		15	45	230	25	1900							
25291	940	960		15	190	120	20	1600							
25292	960	980		15	480	3000	25	1100							
25293	980	1000		15	330	5200	25	1100							
25294	1000	1020		25	85	8900	25	1400							
25295	1020	1040		35	1050	2200	20	960							
25296	1040	1060		25	310	2200	20	1500							
ASSAY TECHNIQUE: AMDEL JOB NO. 2544/72															

BORE HOLE ASSAYS

			NAME OF BORE/WELL: LAKE FROME No.3												
	Footage		Sample Type	Lithology	Formation	Cu	Pb	Zn	Ni	Mn					
Assay No.	From	To				ppm	ppm	ppm	ppm	ppm					
25297	1060	1080	Cuttings			25	540	440	25	1100					
25298	1080	1100	"			15	390	3500	25	1200					
25299	1100	1120	"			25	640	3500	25	1500					
25300	1200	1220	"			25	280	2900	25	1100					
25301	1220	1240	"			15	300	1400		1100					
25302	1240	1260	"			15	250	1.3%		960					
25303	1260	1280	"			10	260	2500		800					
25304	1280	1300	"			5	80	500		660					
25305	1300	1320	"			15	210	3500		1200					
25306	1320	1340	"			30	3900	1.3%		1300					
25307	1332	1342	Cone			5	10	65		710					
25308	1340	1350	"			25	100	690		290					

ASSAY TECHNIQUE:	AMDEL JOB NO.	2544/72
------------------	---------------	---------

272

BORE HOLE ASSAYS

INDEX NO.

			NAME OF BORE/WELL: LAKE FROME No. 3												
	Footage		Sample Type	Lithology	Formation	Cu	Pb	Zn	Mn						
Assay No.	From	To				ppm	ppm	ppm	ppm						
25309	1360	1380	Cuttings			20	40	300	330						
25310	1390	1400				15	45	400	660						
25311	1400	1420				15	15	240	470						
25312	1430	1440				25	15	370	510						
25313	1440	1480				15	20	320	370						
25314	1480	1520				15	20	250	420						
25315	1520	1560				5	5	220	310						
25316	1560	1600				5	25	140	290						
25317	1600	1640				25	50	350	410						
25318	1640	1660			15	10	170	310							

ASSAY TECHNIQUE: AMDEL JOB NO. 2544/72

BORE HOLE ASSAYS

INDEX NO.

[illegible]

⚡ NOTE: Reliable valves. No contamination

EUCLA BASIN - SOUTHERN SECTION

MALLABIE NO. 1, GUINEWARRA, ALABALA KAROO

A N D

NULLARBOR BORES 2, 5, 6, 7 and 8.

LATITUDE LONGITUDE

BORE HOLE RECORD

INDEX NO.

31°27'

129°36'

NAME OF BORE/WELL: AMBALA KAROO

GEOLOGIC AREA : EUGLA BASIN

_____ :

_____ :

_____ :

NOTES ON LOCATION : Mullarben PlainsDATE COMPLETED : pre 1914.ABBREVIATED LOG : G-T-? 740-?-gr-1084 (St. int. Bore List Log.).REFERENCES : DPM St. int. Bore List No. 408.

G.S.S.A. Bull. 23.

G.S.S.A. Handbook of Geol. p. 195

REMARKS :

LATITUDE LONGITUDE

BORE HOLE RECORD

INDEX NO.

NAME OF BORE/WELL: GUINEWARA BORE

GEOLOGIC AREA : EUGLA BASIN

_____ :

_____ :

_____ :

NOTES ON LOCATION : Mullarben PlainsDATE COMPLETED : 1892.ABBREVIATED LOG : 0-5-100 ft - ? granite - 1277.
~~6-7-240 ft - ? granite - 1500.~~REFERENCES : D.M. Strat. Bore List no 407.
G.S.S.P. Bulletin 23.REMARKS : Old mine's bore core fragments found in Miner Dept Museum.

Section L.S. mode 1968 in G.S.S.P. Handbook of Sp. Geol. p. 195.

approx : Mullarben L.S. 2, Mioc. 0-100.

Winton Bluffs M. O. E. 200-500.

Hampton Sandstone Fm. 500-600.

New Cret. shales (Albian) 600-1000.

Lower Cret. Sandstone, grit with 1000-1100.

feldspar Porphyry. 1100-1200.

281

LATITUDE LONGITUDE

BORE HOLE RECORD

INDEX NO.

31° 32' 14" S

130° 36' 06" E

NAME OF BORE/WELL: MALLABIE NO. 1

GEOLOGIC AREA : EUCLA BASIN

_____ :

_____ :

_____ :

NOTES ON LOCATION :DATE COMPLETED : 1969, Outback Oil Co. N.L.ABBREVIATED LOG :

L. Mica. Nullarbor s/s 0-103 ; Upper Ecc. Wilson Bluff s/s 103-563 ; Ecc. Pidinga carbonaceous and
 glauconitic siltstones, clay & sandst., 563-617(?) ; L. Cret. s/s, siltst., mudst., congl. 617?-1140 ;
 Perm. s/s, porphyry (spilitic suite) 1140-1430 ; Camb-Ord. s/s, siltst., porphyry (spilitic suite?) 1430-3006
 siltstone, claystone
 [3006-3956 porph] ; Prot(?) s/s (shallow marine) 3960-4400 ; Archean Granite gneiss 4400-4907.

REFERENCES :

DPM Env. 1172 (SR 27/4/10)

REMARKS :

vols' biot.-qtz-fels. gn. gn. ; amphib. facies regio. v. mm. → greenschist by slight retrogression.
 Mallabie vols. strikingly similar to Roopena vols.

BORE HOLE ASSAYS

INDEX NO.

			NAME OF BORE/WELL: MALLABIE No.1.												
	Footage		Sample Type	Lithology	Formation	Cu	Pb	Zn							
Assay No.	From	To				ppm	ppm	ppm							
x 21350	3600	3650	Cuttings	Volcanics	Carpentarian? Cambro-Ord?	280	75	200							
x 21351	3650	3700	"			30	90	540							
21352	3700	3750	"			35	45	100							
x 21353	3750	3800	"			130	10	75							
x 21354	3800	3850	"			20	130	230							
21355	3850	3900	"			40	10	60							
21356	3900	3950	"			45	10	60							
21357	3950	4000	"			45	15	200							
x 21358	4000	4050	"			40	50	310							
21359	4050	4100	"			25	15	85							
21360	4100	4200	"			10	10	45							
21361	4200	4300	"			21361	4300	15	25	150					
ASSAY TECHNIQUE: AMDEL JOB NO. 1800/72 C1 (Cu, Pb, Zn.)															

3023' - qtz. carb. - haem rock (alt. amygd. basalt.)?

BORE HOLE ASSAYS

			NAME OF BORE/WELL: MALLABIE No.1														
	Footage		Sample Type	Lithology	Formation	Cu	Pb	Zn	V	W	Mo	Be					
Assay No.	From	To				ppm	ppm	ppm	ppm	ppm	ppm	ppm					
21362	4300	4400	Cuttings	Granite Gneiss	Archean	15	15	70									
21363	4400	4500	"			25	25	80									
x 21364	4500	4600	"			210	20	55									
21365	4600	4700	"			35	30	110									
21366	4700	4800	"			15	30	100									
x 21367	4800	4880	"			10	110	200									
21337	3023	3031	Cove	altered amygdaloidal acid Volcanic		35	40	170	120	x	x	3					
ASSAY TECHNIQUE: AMDEL JOB NO. 1800/72 CI (Cu, Pb, Zn) Spectro V, Mo, W, Be.																	

BORE HOLE ASSAYS

INDEX NO.

			NAME OF BORE/WELL: NULLARBOR PLAINS No. 2											
Footage		Sample Type	Lithology	Formation	Cu	Pb	Zn	Ag.						
Assay No.	From				To	ppm	ppm	ppm	ppm					
25701	5	88	Chips			5	5	5	<1					
25702	88	450	"			5	5	85	<1					
25703	450	475	"			5	20	260	<1					
25704	475	530	"			5	15	85	<1					
25705	530	735	"			30	15	380	<1					
25706	735		"			5	<5	25	<1					
25707	735	788	"			20	20	800	<1					
25708	788	810	"			10	10	40	<1					
25709	810	818	"			5	<5	5	<1					
END OF BORE														

ASSAY TECHNIQUE: AMDEL JOB NO. 2761/72

LATITUDE LONGITUDE

BORE HOLE RECORD

INDEX NO.

31° 10'	130° 56'	NAME OF BORE/WELL: MULLAPOR PLAINS NO. 5	
---------	----------	--	--

GEOLOGIC AREA : ROCK BASIN

_____ :

_____ :

_____ :

NOTES ON LOCATION :

DATE COMPLETED : 1893

ABBREVIATED LOG : 27m stat. dist. Log. : a. Day-sand - 670'.
+ 0-T-260 - sand - 669½ T.D.

REFERENCES : G.S.S. & Bulletin 23.
D.M. stat. Bore List no. 396.

REMARKS :

LATITUDE LONGITUDE

BORE HOLE RECORD

INDEX NO.

3° 09'

131° 12'

NAME OF BORE/WELL: DOLLARBOZ PLAINS NO. 6.

GEOLOGIC AREA : EUCLA BASIN

_____ :

_____ :

_____ :

NOTES ON LOCATION :DATE COMPLETED : 1953 ?

ABBREVIATED LOG : approx. only (taken from pages req. below).
 Hurlerb. s/s 0-100'; Wilson Stg. s/s 100-310; Pidinga Form. 310-500; L. Cret. s/s 500-590; L. Cret. s/s 590-640;
 Prof. ~~Stg.~~ Stagetum 640-920; Precamb. granite 920-1000 T.D.

REFERENCES : DTP Strat. Bore no. 395. (Abbrev. log given as : 0-T-230-sand-shale-1000)

Hurlerb. s/s 620', G.S.A. 1969 p. 195.

Ludbrook, N.H. 1961 Subseq. strat. of the Manilla area, S.A. Trans. Roy. Soc. S.A. 84: 51-59

Ludbrook, N.H. 1963 Correl. of the Tert. rocks of S.A. Trans. Roy. Soc. S.A. 87: 5-15.

REMARKS :

BORE HOLE ASSAYS

			NAME OF BORE/WELL: NULLARBOR PLAINS No. 6											
Footage		Sample Type	Lithology	Formation	Cu	Pb	Zn	Ag						
Assay No.	From				To	ppm	ppm	ppm	ppm					
22201	120	130	Cuttings		5	35	700	<1						
22202	220	240	"		5	25	45							
22203	240	280	"		5	35	170							
22204	280	344	"		5	35	310							
22205	344	400	"		5	15	260							
22206	400	430	"		20	90	4200							
22207	430	450	"		10	15	650							
22208	450	455?	"		5	<5	110							
22209	455	470?	"		<5	<5	95							
22210	470	503	"		5	5	90							
22211	503	520	"		15	15	400							
22212	520	540	"		20	25	45							

ASSAY TECHNIQUE: A/A AMDEL JOB NO. 2373/72

LATITUDE LONGITUDE

BORE HOLE RECORD

31° 01'	131° 35'	NAME OF BORE/WELL: NOLLAARBOOR P. HING NO. 7	
---------	----------	--	--

GEOLOGIC AREA : ECLP BASIN.

_____ :

_____ :

_____ :

NOTES ON LOCATION : Near east edge of basin

DATE COMPLETED : 1900?

ABBREVIATED LOG : Strat. Bore List log. shale - 231 - 6' - 530 - T. D (1000').
(Virgatus Nollanba 146-530).

REFERENCES : DPM Strat. Bore List No. 394.
G.S.G.A. Bulletin 23.
Handbook 54 609. G.S.G.A. 1969, p. 195.

REMARKS : x-section p. 195 approx log: 0 - 60 ^{L Mio.} Nollanba ls; 60 - 150 ^{M-U Eoc.} Wilson Bluff Ms; 150 - 220 ^{Eoc.} Hampton Sls; 220 - 350 ^{Eoc.} Pidinga form.
350 - 500 L. Crd. shale; 500 - 530 br. & gr.

BORE HOLE ASSAYS

INDEX NO.

			NAME OF BORE/WELL: NULLARBOR PLAINS No.7											
	Footage		Sample Type	Lithology	Formation	Cu	Pb	Zn	U					
Assay No.	From	To				ppm	ppm	ppm	ppm					
21391	20	150				5	60	260	2					
21392	150	220				<5	15	70	4					
21393	220	255				50	40	100	5					
21394	255	295				390	75	480	5					
21395	295	366				5	15	180	4					
21396	366	380				10	20	660	5					
21397	380	447				<5	20	480	2					
21398	447	485				<5	10	100	2					
21399	485	505				5	25	1400	<2					
21400	505	520				15	30	1400	<2					

ASSAY TECHNIQUE: ^A/₄ AMDEL JOB NO. 2373/72

LATITUDE LONGITUDE

BORE HOLE RECORD

INDEX NO.

31°27'S

130°06'

NAME OF BORE/WELL: NULLARBOR NO. 2 (YANGOONABBIE BORE)

GEOLOGIC AREA : EULLA BASIN
(MALABIE DEPRESSION)

_____ :

_____ :

_____ :

NOTES ON LOCATION :DATE COMPLETED :ABBREVIATED LOG :

0-38 Pleist. sandy calc. clay; 38-100 L. Mioc. Nullarbor L/S; 100-500 Upper Eocene Wilson Bluff L/S; 500-528 middle-upper Eocene glauconitic hyzozal limestone; 528-538 ?Eocene Hampton Conglomerate; 1 Cret. 11538-680 non marine siltstone → sandstone; 680-890 marine grey mudstone, 890-915 grey siltstone and sandstone, 915-1112 feldspathic cobbly sandst. & siltstone, 112-1132 pyritic grit; L. Permian non-glacial grey claystone 1132-1387; 1387-1500 TD Precamb. feldspar porphyry.

REFERENCES :

DTM Env. 645; Strat. Drilling Project OEL 33 Outback Oil 1966

DTM Strat. Base List log: 0-T-240-shale-900-?-granite TD 1800.

G.S.S.A. Bull. 23

G.S.S.A. Handbook of SA Geol. p155

Ludbrook N.H. & Harris W.K., 1966 — Occurrence of Permian Sediments in the Eulla Basin, South Australia. G.S.S.A. Quarterly Geol. Notes No. 17 p11-14

Thompson B.P., 1970 A review of the Precambrian and Lower Palaeozoic tectonics of South Australia. Trans. R. Soc. S. Aust. Vol. 94.

REMARKS :

BORE HOLE ASSAYS

INDEX NO.

			NAME OF BORE/WELL: NULLARBOR PLAINS NO. 8											
Assay No.	Footage		Sample Type	Lithology	Formation	Cu	Pb	Zn	Ag	U				
	From	To				p.p.m.	p.p.m.	p.p.m.	p.p.m.	p.p.m.				
135	890	900	FRAGMENTS	Grey siltstone and sandstone	L. Cretaceous Aptian	15	5	65	<1					
136	900	915		"		5	10	15		2				
137	960	970		← felspathic cobbly sandstone and siltstone	L. Cretaceous Neocomian - Aptian.	10	35	45		2				
138	1132	1146				30	25	140						
139	1112	1132		Grey claystone	L. Permian	5	25	10						
140	1200	-				35	20	110						
141	1200	-			1387'	20	10	85						
142	1390	1400				20	190	190						
143	1470	1480		felspar porphyry	Precambrian	65	25	1000						
144	1490	1500				60	25	1000						

TECHNIQUE: A/A AMDEL JOB NO. 2373/72

GAWLER CRATON
NORTHERN SECTION

MT. CHRISTIE AND MT. WOODS DRILLING

WITH REFERENCES TO WALLIRA NOS. 1 & 2, MT. FURNER
NO. 1, MARALINGA NO. 7 AND LAKE PHILLIPSON BORES

LATITUDE LONGITUDE
APPROX

BORE HOLE RECORD

INDEX NO.

30° 18' 30"

133° 30' 30"

NAME OF BORE/WELL: MT. CHRISTIE CD1

GEOLOGIC AREA : GAWLER CRATON.

_____ :

_____ :

_____ :

NOTES ON LOCATION :DATE COMPLETED : DTM 1965ABBREVIATED LOG :REFERENCES :

DTM Rept. Bk. 60/42

G.S. no 3094

D.m. 281/65 page 11.

0-71.5 Decomp. schist

71.5-150 med. grained magnetite and magnetite metajaspilite

150-250 Coarse grained magnetite jaspilite with
occasional acid veinlets250-301 med. and c.g. magnetite metajaspilite with much
chlorite and numerous acidic and one basic dyke301-349. med. - c.g. pink and grey "granite" with garnets
(Whitten, 1965).REMARKS :

LATITUDE LONGITUDE
APPROX.

BORE HOLE RECORD

INDEX NO.

20° 18' 30"

133° 30' 30"

NAME OF BORE/WELL: MT. CHRISTIE CD 2

GEOLOGIC AREA : GAWLER CRATON

_____ :

_____ :

_____ :

NOTES ON LOCATION : MT. CHRISTIEDATE COMPLETED : DTM 1965

ABBREVIATED LOG : 0-143 Decomposed schist
 143-259 c.g. magnetite metajaspilite with occasional acid vnts.
 259-348 m.g. + c.g. metajaspilite with much chlorite and numerous acidic and one basic dyke
 348-386.5 m.g.-cg. pink and grey "granite" with garnets.

REFERENCES :

DTM Dept. Rk. no 60/42

G.S. no. 3094

D.M. 281/65 p.11.

REMARKS : Summary log by G. Whitten DTM 1965

BORE HOLE ASSAYS

302
INDEX NO.

			NAME OF BORE/WELL: MT. CHRISTIE CD2												
Footage		Sample Type	Lithology	Formation	Cu	Pb	Zn	Co	Ni	Cr	Ti	Ag	Nb	Po ₂	
Assay No.	From				To	p.p.m.	p.p.m.	p.p.m.	p.p.m.	p.p.m.	p.p.m.	p.p.m.	p.p.m.	p.p.m.	%
25496	152	167	CORE	See lag.	5	10	45	10	35	70	600	<1	<20	0.16	
25497	167	176			35	20	160	40	120	240	4000			0.25	
25498	176	186			20	20	85	20	40	100	1500			0.33	
ASSAY TECHNIQUE: A/PAMDEL JOB NO. 2685/72					Ti < Nb Semiquant. Spectro.										

LATITUDE LONGITUDE
APPROX.

BORE HOLE RECORD

INDEX NO.

30° 19' 12"

133° 32' 48"

NAME OF BORE/WELL: MOUNT CHRISTIE CD 5

GEOLOGIC AREA : GAWLER CRATON.

_____ :

_____ :

_____ :

NOTES ON LOCATION : GEORGE HILLDATE COMPLETED : DTM 1965ABBREVIATED LOG :

0-50 Canga

50-52 m.g. martite metajaspilite

52-54 Clay rock

54-106 Interbedded clay rock and metajaspilite.

106-134.8 c.g. martite metajaspilite.

134.8-141.5 Decomp. chloritic schist

141.5-144 Decomp. m.g. biotite gneiss

144-175 Chloritic schist, serpentine veinlets 144-157, low grade metajaspilite.

175-182 Low grade jaspilite

182-216 Decomp. chloritic schist.

REMARKS :

216-274 Siliceous schists

274-278 Decomp. chloritic s., in part, siliceous rock.

BORE HOLE ASSAYS

			NAME OF BORE/WELL: MT. CHRISTIE CDS												
Footage		Sample Type	Lithology	Formation	Cu	Pb	Zn	Co	Ni	Cr	Ti	Ag	Nb.	P ₂ O ₅	
Assay No.	From				To	p.p.m.	p.p.m.	p.p.m.	p.p.m.	p.p.m.	p.p.m.	p.p.m.	p.p.m.	p.p.m.	p.p.m.
25492	224	238	CORE	See log.	80	10	75	10	75	250	2000	<1	<20	0.07	
25493	238	252			100	15	90	60	650	920	2000			0.17	
25494	252	262			80	10	75	80	1100	650	1500			0.17	
25495	262	274			80	15	85	80	1100	630	1200			0.20	
ASSAY TECHNIQUE: A/P AMDEL JOB NO. 2685/72					Nba Ti Spectro SemiQ.										

29° 27' 03"S; 134° 01' 31"E			NAME OF BORE/WELL: WALLIRA NO. 1. (D.M. 1970)						WESTERN AUSTRALIAN BASIN							
Assay No.	Footage		Sample Type	Lithology	Formation	Cu	Pb	Zn								
	From	To				b.p.m.	b.p.m.	b.p.m.								
21373	670	680	CORE	Dk. cement grey grit	Permian.	10	10	100								
21374	707	711	CORE	Granodiorite	L.Prot.	15	25	310								
21375	711	721	CORE	qtz-felspar gneiss	L.Prot.	95	35	330								

ASSAY TECHNIQUE: AA AMDEL JOB NO. 2373172

BORE HOLE ASSAYS

28° 6' 15" S ; 134° 28' 30" E			NAME OF BORE/WELL: MT. FURNER NO.1 (DTM1970)						WESTERN ARCHANGA BASIN.							
	Footage		Sample Type	Lithology	Formation	Cu	Pb	Zn								
Assay No.	From	To				p.p.m.	p.p.m.	p.p.m.								
21371	1804	1813	CORE	Banded 'granite' gneiss	L. Prot.	20	20	250								
21372	1813	1821 T.D.	CORE			10	10	320								
					Overgoe Approx.	15	15	285								

LATITUDE LONGITUDE

BORE HOLE RECORD

INDEX NO.

34° 31' 30"

135° 21' 30"

NAME OF BORE/WELL: MT. WOODS HOLES 1-7.

GEOLOGIC AREA : GUNTER PLATEAU

Magnesian anomaly drilling on Nth. limb of major synclinal fold
pitching W.

Bore Site 1 - L. Crst. shales + nodules to 60'

Gray carb. shales - 200'

Pebbly bed + py + mag. - 260'

Magn. + chert gran. + 477' 7"

W. side section 327' 7" - 233' + 329' 10" - 210'

Bore Site 2 - Crst. to 60' then Perm. to 300'

220' - 240' carb. shales + laminar pebbles +
py + magnetite.

Bore 3 - 0-190' shales, py, siltstone.

220-230' - gran. + magnetite + hematite.

Bore 4 - 0-305' - shales etc.

303' - 306' 9" - mag. L/S? (no iron).

Bore 5 - 160' - 167' - amphibolite? + py + mag.

Bore 6 - 203' - 211' - gran. + hematite.

Bore 7 - 255' - 297' 2" - gran. + magnetite + pyrite.

NOTES ON LOCATION : Sm. 67

DATE COMPLETED : Delhi 1966

ABBREVIATED LOG :

REFERENCES : D 576 Env. 576 - ID + Resistivity Survey of Mt. Woods Area.
D 576 Env. 576 - Sm. 67 Mt. Woods Area.

REMARKS :

Py + chert interstitial to the oxides & in transpressive fractures. Sulfides < 5% rock but locally to 25%.
Maximum Delhi assay 0.05% Cu in magnetite. Igneous rocks and metaseds rhyolite - 0.002 - 0.033% Cu.
Scattered magnetite, hematite, pyrite in igneous rocks.

BORE HOLE ASSAYS

			NAME OF BORE/WELL: MT. WOOD HOLE I												
	Footage		Sample Type	Lithology	Formation	Cu	Pb	Zn	Co	Ni	Mn	Cr	Ag		
Assay No.	From	To				p.p.m.	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
22701	424	433	Core			65	10	85	15	25	150	35	<1		
22702	433	440	"			110	10	65	15	35	160	130	<1		
22703	440	448'11"	"			50	5	85	15	35	130	120	<1		
22704	448'11"	456	"			95	5	30	30	35	210	100	<1		
22705	456	462'6"	"			65	5	45	30	25	320	75	<1		
22706	462'6"	478	"			65	5	50	25	25	190	45	<1		

			NAME OF BORE/WELL: MT. WOOD HOLE 2.												
	Footage		Sample Type	Lithology	Formation	Cu	Pb	Zn	Co	Ni	Mn	Cr	Ag		
Assay No.	From	To				ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
22708	306	314	CORE			35	<5	70	35	55	320	95	<1		
22709	314	323	"			45	<5	55	35	50	290	85	<1		
22711	323	327	"			100	5	65	50	80	720	120	<1		

BORE HOLE ASSAYS

[illegible]

BORE HOLE ASSAYS

317
INDEX INC.

[illegible]

LAKE PHILLIPSON TROUGHARCTIC MARINGA SUB-BASIN OF THE GREAT ARTESIAN BASINLAKE PHILLIPSON AND STUART RANGE NO.2 BORESLOGS: LAKE PHILLIPSON BORE (Ludbook, 1967).

Lower Cretaceous	0 - 100	Lower Aptian (marine)
'Jurassic'	100 - 166.8	'Jurassic' (non-marine)
Lower Permian	166.8 - 430	Lower Artinskian-Upper Sakmarian (freshwater)
	430 - 744	Sakmarian (freshwater)
	744 - 2269	Lower Sakmarian (freshwater)
	2269 - 2357	Lower Sakmarian (marine)
	2357 - 3140	Lower Sakmarian (glacial)
L. Proterozoic	3140 - 3163	Granitic basement.

STUART RANGE NO.2 BORE (Ludbook, 1967)

Lower Cretaceous	0 - 44.5	Lower Aptian (marine)
'Jurassic'	44.5 - 253	'Jurassic' (non-marine) - may be Permian in part.
Lower Permian	253 - 486	Lower Artinskian-Sakmarian (freshwater).
	486 - 1000	No samples - presumed Sakmarian.

Also mentioned: *Cootanorina No.1 Well*

BORE HOLE ASSAYS

			NAME OF BORE/WELL: LAKE PHILLIPSON BORE (1905)												
	Footage		Sample Type	Lithology	Formation	Cu	Pb	Zn	Ag	U					
Assay No.	From	To				p.p.m.	p.p.m.	p.p.m.	p.p.m.	p.p.m.					
22236	20	35	COAL FRAGMENTS	lat. mudstone	L. Cret.	50	15	45	41	2					
22237	60	87		mudstone		45	10	550		10					
22238	174	180?		carb. mudstone (plant remains)	lower-Perm.	30	30	1400		3					
22239	190	195?		siltstone	-U. Salmonan (L. Perm. freshwater)	10	10	200		42					
22240	?	310		carb. mudstone		30	50	1300		4					
22241	310	312		coal, pyritic.		20	75	5500							
22242	312	322 (pyrite nodules)		carb. siltstone		15	20	1600							
22243	322	345		silty sandstone, carbonaceous		5	5	430							
22244	345	360		"		5	5	1100							
22245	360	376		sandy clay		5	20	1700							
22246	376	393		sandy carb. clay and coal.		5	45	1600							
22247	393	411		carb. siltstone, pyrite nodules		5	20	1700							

ASSAY TECHNIQUE: A/A AMDEL JOB NO. 2373/75.

BORE HOLE ASSAYS

ASSAY TECHNIQUE: A/A AMDEL JOB NO. 2373/7Y

BORE HOLE ASSAYS

			NAME OF BORE/WELL: LAKE PHILLIPSON BORE (1905)												
	Footage		Sample Type	Lithology	Formation	Cu	Pb	Zn	Ag	U	Co	Ni	Mn	Cr	
Assay No.	From	To				p.p.m.	p.p.m.	p.p.m.	p.p.m.	p.p.m.	p.p.m.	p.p.m.	p.p.m.	p.p.m.	p.p.m.
22272	2310 ²¹	2339	FRAGMENTS	sandy mudstone	Lowermost Sakmarian (glacial) Lake Phillipson Beds.	15	25	75	<1	3					
22273	2355	2397		boulder clays.		10	25	110	<1	2					
22274	2423	2438		"		20	25	120	<1						
22275	2535	2559		"		20	10	110	<1						
22276	2602	2667				20	10	290	<1						
22277	2729	2760				20	5	120	<1						
22278	3145	3157		granitic basement.	Prot.	5	5	15	<1		45	45	150	55	

ASSAY TECHNIQUE: A/A AMDEL JOB NO. 2373/72

BORE HOLE ASSAYS

INDEX INC.

			NAME OF BORE/WELL: STUART RANGE NO. 2. (1920)											
Assay No.	Footage		Sample Type	Lithology	Formation	Cu	Pb	Zn	Ag					
	From	To				p.p.m.	p.p.m.	p.p.m.	p.p.m.					
221198	0	11	COTTINGS	shale, mudstone	L. Cret.	15	5	95	<1					
221199	4	21		kaol. shale	L. Aptian (marine)	20	5	100						
221200	22	33		grey mudstone		30	20	90						
221201	33	47		limestone + shale		5	30	75						
221203	76	103		kaolinitic sand	'Jurassic' (non-marine)	10	5	50						
221204	103	195		gravel	may be Perm. in part	5	<5	60						
221205	195	220		sand		5	<5	65						
221206	253	343		grey mudstone	L. Permian.	25	15	160						
221207	343	396		"	L. Artinskian - Sakmarian	5	<5	55						
221208	340?	486		feldspathic sand	(freshwater)	5	10	250						

ASSAY TECHNIQUE: A/AAMDEL JOB NO. 2373/77

DPA Strat. Bore List no. 357

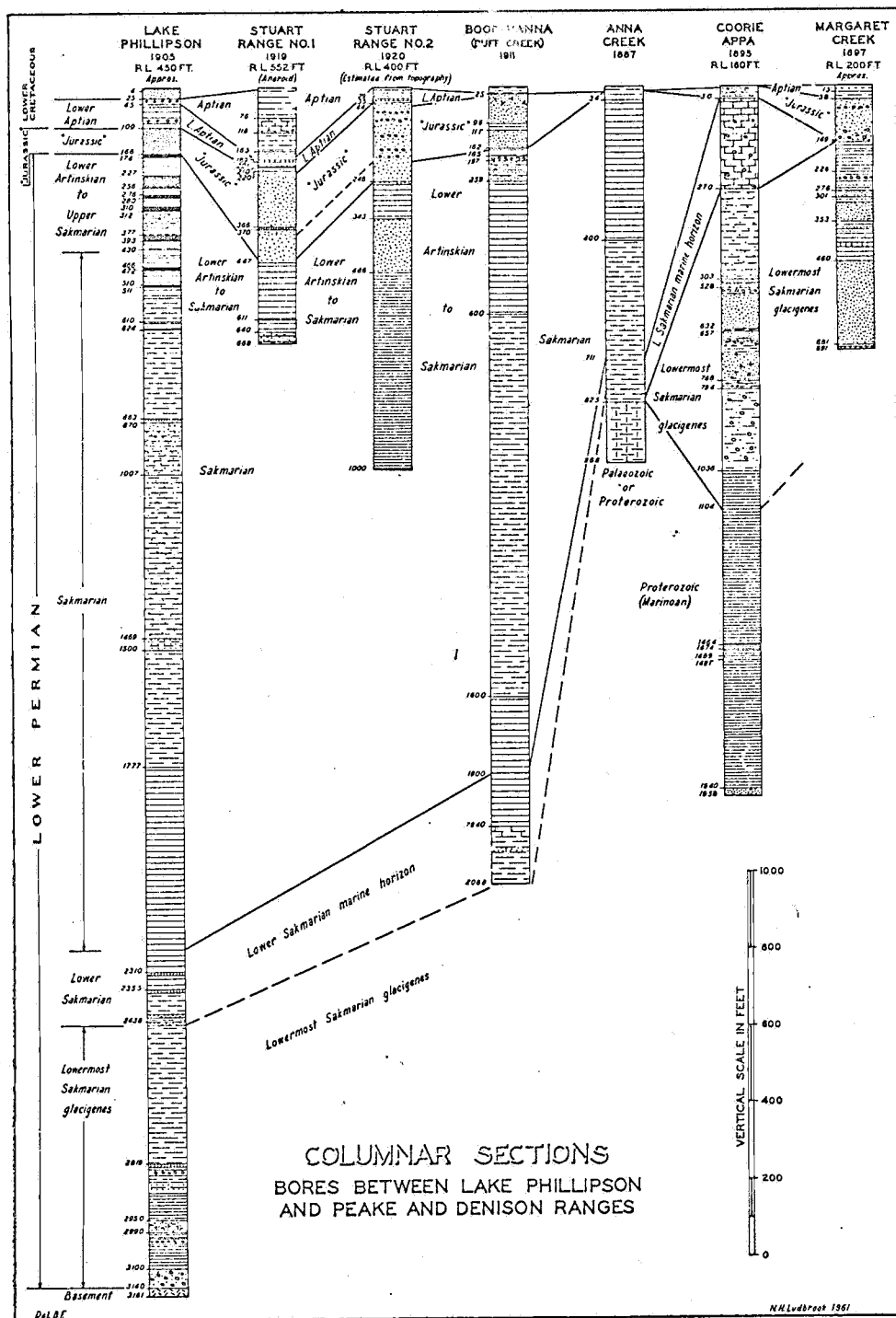


Fig. 2. Columnar sections of bores.

son, Coorie Appa and Margaret Creek—intersected the boulder clays. Towards the end of the glaciation overdeepening seems to have allowed Lower Sakmarian seas to gain access to the area and the glacigenes with occasional foraminifera near the top grade into marine sediments with fairly abundant arenaceous foraminifera.

The source and mode of entry of the sea is an important problem awaiting solution. Marine Permian sediments occur in a similar way on Yorke Peninsula near the top of the glacigenes intersected in Minlaton (Ludbrook, 1957) and Stansbury Bores, but there is at present no evidence of connection during the Permian between Yorke Peninsula and the Lake Phillipson-Peake and Denison area 450 miles to the north-west with the stable shield of Eyre Peninsula between. The possibility of marine Permian sediments occurring in the South Australian part of the Great Artesian Basin connecting with the Bowen Basin cannot at present be overlooked, but no positive evidence has been obtained so far. The only Permian sediments intersected in Delhi-Frome-Santos Innamincka No. 1 Well were freshwater coal-bearing strata of Upper Permian (Kungurian-Kazanian) age. Unless part of the so-called "Jurassic" kaolinitic sandstones are equivalent to these beds, there is no Upper Permian represented in the present bores.

However, to the west of Lake Phillipson and into Western Australia lies the Officer Basin, as yet completely unexplored below the surface. One is tempted to consider the admittedly remote possibility of Permian sediments occurring in the Officer Basin and connecting by means of a north-westerly trough in the direction of the Wilkinson-Mackintosh Ranges to the Canning Basin.

Marine conditions were succeeded by lacustrine conditions during the Sakmarian grading into coal measures towards the Artinskian. Apparently a rich flora existed at this time.

The columnar sections on Fig. 2 are arranged in order:

- (1) from Lake Phillipson to Stuart Range No. 2 along a north-easterly line about 50 miles long;
- (2) from Boorthanna to Margaret Creek about 75 miles in a south-south-easterly direction.

11. DETAILS OF THE BORES

LAKE PHILLIPSON BORE

Completed 1905

Core Depth (feet)	
0' 0" - 4'	Red surface soil and kunkar.
4' - 15' 4"	Red brown medium ferruginous sand with gypsum.
15' 4" - 25' 9"	Fine to coarse red to red-brown sand, gritty at 25 feet, calcareous, with grey, subrounded quartz grains.
25' 9" - 29' 10"	Light grey clay with limonitic nodules and faceted pebbles of quartzite up to 60 mm. long. Washings consist mainly of limonite, a few angular quartz grains, gypsum, some glauconite. There is an assemblage of Aptian arenaceous foraminifera dominated by <i>Textularia</i> sp. 4 and <i>Siphotextularia</i> sp. 2.
29' 10" - 45'	Grey clay with pebbles to 70 mm., all with somewhat flat surfaces, and limonitic layers.
45' - 60' 3"	Light grey mudstone with <i>Haplophragmoides chapmani</i> , <i>Ammobaculites</i> sp. 3, <i>Trochammina minuta</i> and other arenaceous species.
60' 3" - 73' 10"	Cream clay.
73' 10" - 100'	Grey mudstone with fine angular quartz grains, limonite, pebbles at 89' 9" and abundant arenaceous foraminifera including <i>Haplophragmoides chapmani</i> , <i>Haplophragmoides dickinsoni</i> and <i>Textularia ana-cooraensis</i> . This assemblage occurs in the lower part of the Aptian.

Core Depth (feet)		
100'	- 166'10"	Buff gritty kaolinitic sand with coarse subangular quartz, feldspar, coarse grey quartz, fine to medium angular quartz.
166'10"	- 174' 5"	Coal.
174' 5"	- 180' 2"	Grey carbonaceous mudstone, with fine angular quartz grains, abundant plant remains and fine mica.
180' 2"	- 198'10"	Grey siltstone with abundant fine angular quartz, some coarse grains to grit size, earthy, with carbonaceous matter.
198'10"	- 227' 9"	Grey carbonaceous mudstone.
227' 9"	- 256' 3"	Coal.
256' 3"	- 276' 8"	Light grey carbonaceous mudstone with pyrite.
276' 8"	- 280' 5"	Coal.
280' 5"	- 297' 1"	Grey carbonaceous mudstone.
297' 1"	- 303'10"	Grey carbonaceous shale.
303'10"	- 310'11"	Grey carbonaceous mudstone with fine angular quartz grains, abundant plant remains, muscovite.
310'11"	- 312'10"	Coal.
312'10"	- 322'	Grey sandy siltstone with abundant angular quartz grains, muscovite, biotite, chlorite, carbonaceous matter.
322'	- 366'	Grey very fine silty sandstone with fine angular quartz grains, muscovite, chlorite, carbonaceous matter, pyrite.
366'	- 377'10"	Light grey fine sandy clay with fine angular quartz grains, carbonaceous matter.
377'10"	- 393' 2"	Coal.
393' 2"	- 427' 1"	Grey carbonaceous siltstone with fine angular quartz grains, muscovite, and abundant plant remains including lycopod megaspores.
427' 1"	- 430'	Grey carbonaceous mudstone.
430'	- 436'10"	Grey siltstone, very carbonaceous, with abundant plant remains, fine angular quartz grains, mica. Sample effervesces very strongly in sodium carbonate solution. Lycopod megaspores.
436'10"	- 451'10"	Grey carbonaceous mudstone consisting when washed almost entirely of fresh-looking brown plant fragments.
451'10"	- 466' 1"	Grey siltstone with pyrite nodules, fine angular quartz grains, earthy carbonaceous matter and fine muscovite.
466' 1"	- 472' 3"	Coal shale, consisting mostly of earthy coal fragments.
472' 3"	- 483'	Grey carbonaceous sandy siltstone with abundant fine angular quartz grains, coaly matter, some coarse subrounded quartz. Lycopod megaspores.
483'	- 510' 3"	Dark grey carbonaceous mudstone with pyrite nodules to 115 mm. in length.
510' 3"	- 511' 3"	Dark grey coal shale.
511' 3"	- 542' 4"	Light grey mudstone with fine angular quartz grains, abundant muscovite, biotite, chlorite, carbonaceous matter. Lycopod megaspores.
542' 4"	- 610'	Grey siltstone with fine angular quartz grains, carbonaceous matter, muscovite, biotite, chlorite, very fresh plant fragments, pyrite nodules. Lycopod megaspores.
610'	- 624'	Grey irregularly laminated mudstone, fine angular quartz grains, abundant fine muscovite, brown plant fragments. Lycopod megaspores.
624'	- 744' 6"	Dark grey carbonaceous siltstone with fine angular quartz grains, muscovite, abundant brown plant fragments.
744' 6"	- 863'	Brown-grey carbonaceous siltstone with abundant plant remains, carbonaceous matter, muscovite.
863'	- 870'	Grey medium quartz sandstone with angular interlocking grains, muscovite, chlorite, biotite, carbonaceous matter, silty patches.
870'	- 1007' 6"	Grey hard sandy siltstone with abundant carbonaceous matter, chlorite, flat-bedded with fine angular quartz grains, abundant red brown flecks of limonite.
1007' 6"	- 1009'	Grey hard sandstone with fine to medium angular interlocking grains, carbonaceous matter, muscovite.
1009'	- 1459'	Brown-grey siltstone, with fine angular quartz grains, carbonaceous matter, muscovite, reddish limonite flecks.
1459'	- 1607'	Brown-grey hard sandy carbonaceous siltstone with coarse subrounded quartz grains scattered throughout the brown silty matrix, abundant muscovite, yellowish patches apparently due to less humic matter. Arkosic.

Core Depth (feet)		
1607'	-1777'	Grey carbonaceous siltstone, hard, fine even-grained with fine mica, carbonaceous matter.
1777'	-2216'	Dark grey hard carbonaceous mudstone with small leaf impression, conchoidal fracture at 2060', abundant carbonaceous matter at 2070'; laminated at 2115'.
2216'	-2269'	Dark grey hard and even-grained siltstone with carbonaceous fragments, pyrite.
2269'	-2283'	Dark grey hard fine even-grained siltstone with carbonaceous fragments in patches, pyritic patches. Scattered <i>Hyperammina</i> .
2283'	-2310'	Blue-grey carbonaceous mudstone, compacted, with arenaceous foraminifera, particularly <i>Hyperammina</i> scattered fairly abundantly throughout the rock and visible on broken surfaces: cf. <i>Hippocrepinella</i> sp., cf. <i>Hyperammina acicula</i> (Parr), <i>Thurammina phialaeformis</i> Plummer, <i>Ammodiscus multinctus</i> Crespin and Parr, <i>Ammodiscus oonahensis</i> Crespin, <i>Ammocertella inclusa</i> (Cushman and Waters).
2310'	-2312'	Hard grey compacted calcareous laminated mudstone, fine- and even-grained, with fine silica, clay material and calcite.
2312'	-2340'	Dark grey unstratified hard sandy mudstone with abundant coarse quartz grains in a fine matrix somewhat calcareous, mud pellets, small pebbles, pink garnet.
2340'	-2357'	Light grey compact fine-grained claystone with calcite veinlets, conchoidal fracture.
2357'	-2818'	Blue-grey boulder clay-fine-grained siltstone and claystone with fine quartz grains in a clayey matrix, garnet. <i>Ammodiscus</i> at 2438'.
2818'		Grey crystalline limestone sandy in parts with mica, quartz grains.
2818'	-2950'	Grey boulder clay with red sandstone pebbles, grains of quartz scattered irregularly through the matrix, grains of ferruginized quartz.
2950'	-2980'	Grey shale (boulder clay) with calcareous partings abundant grit grains of quartz, red ferruginized quartz grains.
2980'	-2990'	Grey calcareous sandstone with grit size quartz grains in a calcareous cement, pink garnet, iron-stained quartz.
2990'	-3140'	Grey compacted clay with scattered quartz grains, small pebbles mostly from granite bedrock.
3140'	-3161'	Granite basement.
<i>Stratigraphic Summary</i>		
0'	- 100'	Lower Aptian (marine).
100'	- 166'10"	"Jurassic" (non-marine).
166'10"	- 430'	Lower Artinskian-Upper Sakmarian (freshwater).
430'	- 744'	Sakmarian (freshwater).
744'	-2269'	Lower Sakmarian (freshwater).
2269'	-2357'	Lower Sakmarian (marine).
2357'	-3140'	Lowermost Sakmarian (glacial).
3140'	-3161'	Granite basement.

STUART RANGE No. 1

Drilled 1919

Cuttings Depth (feet)		
0'	- 7'	Surface silicified clay and sandstone with some calcite.
7'	- 12'	Brown marine shale, with dark red ferruginized clay with <i>Bigenerina loeblichae</i> , <i>Haplophragmoides</i> sp. 1, <i>Verneulinoides</i> sp. 1.
12'	- 41'	Light grey mudstone, with ferruginized clay.
41'	- 76'	Light grey mudstone with both ferruginized and grey clay.
76'	- 82'	Light grey kaolinized mudstone.
82'	- 118'	Grey calcareous glauconitic siltstone.
118'	- 163'	Dark grey pyritic, siltstone with calcareous foraminifera including abundant <i>Bulimina</i> sp. 2.
163'	- 199'	Dark grey very pyritic siltstone with <i>Trochammina minuta</i> and <i>Margulinina marreensis</i> .
199'	- 201'	Grey cone-in-cone limestone and siltstone.
201'	- 210'	Dark grey pyritic shale.
210'	- 211'	Grey glauconitic and pyritic siltstone and limestone.
211'	- 220'	Grey mudstone.
220'	- 223'	Fine light grey-brown friable pyritic sand.

Cuttings Depth (feet)		
223'	- 224' 6"	Buff sand with limonite.
224' 6"	- 295'	Coarse buff sand with rounded pitted grains and angular grains.
295'	- 447'	Gritty and fine kaolinitic sand.
447'	- 458'	Sandstone and coal.
458'	- 611'	Dark grey carbonaceous mudstone with fine quartz grains and carbonaceous matter. Lycopod megaspores.
611'	- 615'	Dark grey carbonaceous micaceous siltstone, sandy and feldspathic.
615'	- 668'	Dark grey carbonaceous mudstone with pyrite and lycopod megaspores.
<i>Stratigraphic Summary</i>		
0'	- 220'	Aptian (marine).
220'	- 447'	"Jurassic" (non-marine)—may be Permian in part.
447'	- 668'	Lower Artinskian-Sakmarian (freshwater).

Records show this bore as 485 feet deep, but boring continued to 668' and samples were kept to that level.

STUART RANGE No. 2

Drilled 1920

Cuttings Depth (feet)		
0'	- 4'	Red surface clayey soil.
4'	- 16'	Grey gypsaceous shale, very weathered and ferruginized.
16'	- 29'	Grey kaolinized shale, weathered and ferruginized with subangular quartz, glauconite, kaolin and poorly preserved foraminifera including <i>Textularia anacooraensis</i> .
29'	- 33'	Light buff grey mudstone, ferruginized with glauconite and angular quartz and a Lower Aptian foraminiferal assemblage including <i>Haplophragmoides chapmani</i> and <i>Textularia anacooraensis</i> .
33'	- 44' 6"	Cone-in-cone limestone and calcareous shale.
44' 6"	- 47'	Grey fine sandstone with brown mineral grains.
47'	- 51'	Grey-brown gritty sandstone.
51'	- 54'	Sandstone and gravel with grains to 10 mm. of blue-grey quartz, pink quartzite.
54'	- 64'	Light buff coarse quartz sand with subangular grains.
64'	- 76'	Coarse gravel with pebbles to 40 mm. of various origins.
76'	- 86'	Light cream-buff kaolinitic sand with medium quartz grains—arkosic.
86'	- 195'	Gravel with miscellaneous pebbles, mostly blue-grey quartz, some faceted, medium subangular quartz, feldspar.
195'	- 204'	Light brown sand with fairly well sorted subangular medium quartz grains.
204'	- 220'	Grey-buff gritty sand, kaolinitic, with blue-grey quartz grains, and medium subangular clear quartz.
220'	- 253'	Light grey-buff medium sand with coarse mostly angular to subangular quartz, greyish and clear, pink garnet, siderite, feldspar.
253'	- 343'	Grey mudstone, with grit size pebbles of various origins, pyrite, feldspar, subangular quartz, garnet, iron minerals, plant fragments, opaline quartz.
343'	- 486'	Grey-buff feldspathic sand, with coarse to fine angular to rounded quartz grains, feldspar, pyrite.

No samples were kept from below 486 feet.

Stratigraphic Summary

0'	- 44' 6"	Lower Aptian (marine).
44' 6"	- 253'	"Jurassic" (non-marine)—may be Permian in part.
253'	- 486'	Lower Artinskian-Sakmarian (freshwater).
486'	- 1000'	No samples, but presumed Sakmarian.

BOORTHANNA (DUFF CREEK)

Drilled 1911

Cuttings Depth (feet)		
0'	- 25'	Chocolate clayey surface soil, with coarse angular quartz grains, iron-stone fragments and quartzite.
25'	- 45'	Buff clayey gritty sand with fresh feldspar.

Cuttings Depth (feet)		
45'	- 70'	Light red-brown fine clayey sand and grit with fresh feldspar and mica.
70'	- 80'	Light brown fine clayey sand.
80'	- 90'	Off-white clayey gritty sand and coarse grit with blue-grey quartz.
96'	- 117'	Grey mudstone with small pebbles.
117'	- 134'	Light buff argillaceous sandstone, kaolinitic and micaceous with fine angular quartz and some grit grains.
134'	- 162'	White kaolinitic sand and gravel with small blue-grey quartz pebbles about 10 mm.
162'	- 185'	Grey siltstone with a few grit size pebbles, coal fragments, mica, some pyrite. Lycopod megaspores.
185'	- 187'	Grey coarse quartz grit with abundant grit size grains, mostly subangular to angular and of grey quartz, opaline quartz, siderite.
187'	- 197'	Light buff coarse kaolinitic sandstone.
197'	- 250'	Grey siltstone with quartz-pyrite aggregates, subrounded to subangular quartz to grit size, broken quartzite pebble, coaly matter, biotite, feldspar, siderite, pink garnet. Lycopod megaspores.
250'	- 300'	Grey silty mudstone with medium angular quartz chlorite, pink garnet, biotite, pyrite.
300'	- 400'	As above with plant fragments and pyrite aggregates to 5 mm.
400'	- 600'	Grey siltstone with abundant quartz-pyrite aggregates as above.
600'	- 1100'	As above, with fine to medium angular quartz, pyrite.
1100'	- 1295'	As above, with pyrite aggregates, quartzite.
1295'	- 1474'	Grey calcareous siltstone with carbonaceous matter, very fine quartz grains in a calcareous matrix, fragments of quartzite, rounded quartz grains.
1474'	- 1600'	Grey carbonaceous mudstone with coarse rounded quartz medium to fine angular quartz, carbonaceous siltstone.
1600'	- 1625'	Dark grey calcareous and carbonaceous siltstone with very fine angular quartz, pyrite muscovite, biotite, coarse rounded to subrounded quartz, calcareous cement.
1625'	- 1800'	Dark grey highly carbonaceous siltstone with fine mica and foraminifera at 1800' - <i>Hyperammina</i> sp., <i>Textularia</i> sp., ? <i>Polytaxis</i> sp., <i>Thurammina phialaeformis</i> Plummer.
1800'	- 1900'	Dark grey carbonaceous siltstone with coarse subrounded quartz grains and foraminifera. The foraminifera are common but badly preserved, and identification for the most part would be hazardous. The assemblage includes cf. <i>Hippocrepinella biaperta</i> Crespin, <i>Hyperammina</i> cf. <i>acicula</i> (Parr) and <i>Thurammina phialaeformis</i> Plummer.
1900'	- 1950'	Dark grey carbonaceous siltstone as above with calcareous patches and numerous badly preserved foraminifera.
1900'	- 2000'	Brown sandy carbonaceous siltstone with fine muscovite, foraminifera <i>Hyperammina</i> sp., cf. <i>Hippocrepinella</i> sp., <i>Thurammina phialaeformis</i> .
2000'	- 2088'	Dark grey glauconitic siltstone with fine to medium quartz grains, pyrite, pale green glauconite, some plant fragments. Abundant foraminifera including <i>Hyperammina acicula</i> (Parr), <i>Thurammina phialaeformis</i> Plummer, <i>Ammodiscus oonahensis</i> Crespin, cf. <i>Ammovertella inclusa</i> (Cushman and Waters), and species of <i>Ammobaculites</i> , (?) <i>Polytaxis</i> , <i>Trochammina</i> .
<i>Stratigraphic Summary</i>		
25'	- 162'	"Jurassic" - (non-marine).
162'	- 1800'	Lower Artinskian-Sakmarian (freshwater).
1800'	- 2088'	Lower Sakmarian (marine).

ANNA CREEK

Drilled 1887 (Railway Bore)

Core Depth (feet)		
0'	- 18'	No samples.
18'	- 34'	Yellow micaceous siltstone with fine angular quartz, pink garnet, muscovite.
34'	- 400'	Dark grey very carbonaceous mudstone with abundant plant remains.
400'	- 500'	Very dark grey carbonaceous mudstone with abundant plant remains. Lycopod megaspores.

GAWLER CRATON

TARCOOLA BEDS, TARCOOLA

Dept. of Mines Diamond Drill Holes,

T.D.1, T.D.2 and T.D.3.

ADDENDUM

D.M. D.D.H TARCOOLA T.D.4.

February 1972

LATITUDE LONGITUDE

BORE HOLE RECORD

INDEX NO.

NAME OF BORE/WELL: TARCOOL T.D. 1

GEOLOGIC AREA : GAWLER CRATON

_____ :

_____ :

_____ :

NOTES ON LOCATION :DATE COMPLETED :ABBREVIATED LOG :REFERENCES :REMARKS : Hile Declination 70° N

0-12 quartzite - sandy and clayey.
 12-23 sandstone, shale - gritty in places
 23-52 decomposed shale - silty to sandy
 52-58 alternating sandy shale and sandstone;
 decomposed qtz-felspar rock (Syke?)
 58-81.5 decomposed silty shale
 81.5-101.6 decomposed clay shale
 101.6-110.6 80% vein quartz
 110.6-123 decomposed shale alternating with
 quartzite
 123-135.5 gritty quartzite - slightly brecciated
 135.5-139.5 pebble and cobble conglomerate (fragments
 of qtz, jaspilite, shale in greywacke)
 139.5-145 qtz-felspar grit.
 145-166.5 cobble conglomerate (qtz + jaspilite
 in matrix of qtz + hornblende.
 166.5-177.9 qtz-felspar-hornblende granite
 177.9-181 f.g. amphibolite
 181-201 qtz-felspar-hornblende granite

BORE HOLE ASSAYS

			NAME OF BORE/WELL: TARCOOLA TD 1												
Footage		Sample Type	Lithology	Formation	Cu	Pb	Zn								
Assay No.	From				To	t.p.m.	t.p.m.	p.p.m.							
25920	12	23	Core			25	15	25							
25921	23	35				45	20	45							
25922	35	45				45	20	5							
25923	45	55				45	35	5							
25924	55	66				45	15	30							
25925	69	74				45	20	10							
25926	74	83				45	35	5							
25927	82	90				15	35	130							
25928	90	99.7				20	55	250							
25929	99.7	110.6				130	60	200							
25930	110.6	121				140	40	400							
25931	121	132.7				20	30	75							

ASSAY TECHNIQUE: AAMDEL JOB NO. 335772.

BORE HOLE ASSAYS

			NAME OF BORE/WELL: TARCOOLA T D 1											
Footage		Sample Type	Lithology	Formation	Cu	Pb	Zn							
Assay No.	From				To	p.p.m.	p.p.m.	p.p.m.						
25932	132.7	143	Core		10	10	75							
25933	143	154			10	10	85							
25934	154	165.8			5	10	60							
25935	165.8	178.4			5	15	75							
25936	178.4	189.1			5	20	85							
25937	189.1	195			10	15	50							
25938	195	201			10	75	60							

ASSAY TECHNIQUE: #AAMDEL JOB NO. 3352/72

LATITUDE LONGITUDE

BORE HOLE RECORD

INDEX NO.

NAME OF BORE/WELL: TARCOOLA T.D. 2

GEOLOGIC AREA : SAWLER CRATON

_____ :

_____ :

_____ :

NOTES ON LOCATION :DATE COMPLETED :ABBREVIATED LOG :REFERENCES :REMARKS : Hole Sectionation 700 N.0-15 quartzite - clayey and shaley zones; grit
bands in places.

15-76 weathered siltstone, very minor quartzite.

76-100 clay shale - iron stained quartzite

100-123.2 greywacke

123.2-129.5 grit and pebble (qtz, gzt, fsp, lit)
conglomerate. Pyrite ~ 1%.

129.5-131.5 qtz-feldspar grit. Trace pyrite.

131.5-150.7 cobble conglomerate. Pyrite throughout
with concentrations at 144', 147', 149'.

150.7-173 granite

173-176.2 amphibolite

176.2-200.4 granite

BORE HOLE ASSAYS

			NAME OF BORE/WELL: TARCOOLA TD.2											
	Footage		Sample Type	Lithology	Formation	Cu	Pb	Zn						
Assay No.	From	To				b.p.m.	b.p.m.	b.p.m.						
25901	0	21.5	Core			5	30	5						
25902	21.5	30.2				25	10	5						
25903	30.2	39.5				25	15	5						
25904	39.5	51.5				25	30	5						
25905	51.5	60.8				5	80	5						
25906	60.8	70.5				5	85	55						
25907	70.5	80.5				65	25	170						
25908	80.5	90.2				65	60	570						
25909	90.2	101.2				40	20	860						
25910	101.2	110.8				25	5	40						
25911	110.8	120.5				5	5	35						
25912	120.5	128				25	25	50						

ASSAY TECHNIQUE: A/AMDEL JOB NO. 3352/72

LATITUDE LONGITUDE

BORE HOLE RECORD

INDEX NO.

NAME OF BORE/WELL: TARCOOLA TD3

GEOLOGIC AREA : GAWLER CRATON

:

:

:

NOTES ON LOCATION :DATE COMPLETED :ABBREVIATED LOG :REFERENCES :REMARKS : D.D.H. Sepicard 70°N

0-5 quartzite

5-10.5 quartzite with white
kaolinitic material

10.5-12.6 "

12.6-16.1 kaolinitic material after
silicified shale.

16.1-17.0 quartzite

17.0-18.0 kaolinitic material, steep bedding

18.0-20.0 altered quartzite

20.0-25.0 yellow and brown stained
kaolinitic material.25-30.5 cherty quartz with clayey
material - brown and yellow
staining.

30.5-35.0 yellow and brown clays.

35.0-45.3 pinkish brown clay - qtz. fragments

45.3-54.0 yellow brown clay with qtz. pebbles,
some purple and green staining.

54.0-55.0 qtzite

55.0-65.0 conglomerate Qtz - feldspar pebbles,
reddish matrix. Chalco? Partly
silicified near 65.0'.65.0-75.0 cobble conglomerate Qtz and
jasp. lite fragments, chloritic
matrix. 190 mineralisation

75.0-83.3 Amphibolite - qtz. veining.

83.3-86.6 mineralised cobble conglomerate.
chalco. and pyroxenite.86.6-95.0 Amphibolite -
jasp. lite pebbles,
Qtz veining.95.0-106.0 cobble conglomerate -
amphibolites and
silicified.106-115.2 amphibolite with qtz veins,
contact with granite is
mineralised 112.9-114.7-116
chalco + pyx.115.2-121.6 c.g. adamellite
feldspar, qtz, chlorite121.6-125.7 grey grey amphib
no mineralisation125.7-128.0 Adamellite -
min. free.

LATITUDE LONGITUDE

BORE HOLE RECORD

INDEX NO.

30° 42'S	134° 32'E	NAME OF BORE/WELL: TARCOOLA TD 4	
GEOLOGIC AREA : TARCOOLA BEDS - GAWLER CRATON _____ : _____ : _____ : <u>NOTES ON LOCATION</u> : P.D. Assumed to be one of two holes Sited on IP anomaly N of Tarcoola Hill. <u>DATE COMPLETED</u> : <u>ABBREVIATED LOG</u> : see lithology on assay sheets. <u>REFERENCES</u> : none found in DPM to Feb. 1972. <u>REMARKS</u> :			

BORE HOLE ASSAYS

			NAME OF BORE/WELL: TARCOOLA TD 4														
	Footage		Sample Type	Lithology	Formation	Cu	Pb	Zn	Ag								
Assay No.	From	To				p.p.m.	p.p.m.	p.p.m.	p.p.m.								
25720	5	12	core	shale + sandstone dominantly sandstone	Tarcoola Beds	5	15	5	<1								
25721	12	19						10	50	25							
25722	19	26						15	130	10							
25723	26	33						20	65	15							
25724	33	41						15	45	15							
25725	41	48						20	70	10							
25726	48	55						55	150	5							
25727	55	62						20	65	5							
25728	62	70						25	70	45							
25729	70	76						10	45	10							
25730	76	85						20	30	10							
25731	85	92						45	95	10							

ASSAY TECHNIQUE: AAAMDEL JOB NO.276172

BORE HOLE ASSAYS

INDEX NO.

			NAME OF BORE/WELL: TARCOOLA TD 4											
Assay No.	Footage		Sample Type	Lithology	Formation	Cu	Pb	Zn	Ag					
	From	To				p.p.m.	p.p.m.	p.p.m.	p.p.m.					
25732	92	105	core	sandstone	Tarcoola Beds.	45	10	5	<1					
25733	105	116		shale		150	40	25						
25734	116	123		shale + siltstone		85	20	120						
25735	123	130		shale + siltst. with pyrite		35	40	15						
25736	130	136		shale with pyrite		160	30	35						
25737	136	143		shale and siltstone		130	120	25						
25738	143	150		"		30	75	25						
25739	150	157		shale		15	130	30						
25740	157	169		"		320	45	10						
25741	169	176		"		200	30	10						
25742	176	186		quartzite		150	10	60						
25743	186	200		"		95	10	70						

ASSAY TECHNIQUE: A/AAMDEL JOB NO. 2761/72

MISCELLANEOUS BORES

APPREETINA BORE

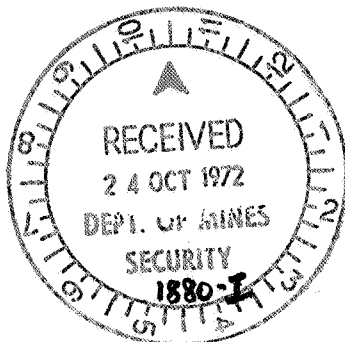
BARATTA No.1

MARLA BORE

~~OT~~

ROBERTSON No. 1.

MALBOOMA COAL BORES 1,2,3,5



346

LATITUDE LONGITUDE

BORE HOLE RECORD

INDEX NO.

27° 45' S

131° 15' E

NAME OF BORE/WELL: APPRETTINA BORE

GEOLOGIC AREA : BETWEEN OFFICER / PEDIRKA BASIN

_____ :

_____ :

_____ :

NOTES ON LOCATION :DATE COMPLETED :ABBREVIATED LOG :REFERENCES : located on Wintinna Topog. 1:250,000 P.D.
U.S.S.A. QuarterREMARKS :

LATITUDE LONGITUDE

BORE HOLE RECORD

INDEX NO.

31° 54' S

139° 28' E

NAME OF BORE/WELL: BARATTA NO. 1..

GEOLOGIC AREA : ADELAIDE GEOSYNCLINE

_____ :

_____ :

_____ :

NOTES ON LOCATION : 60 miles NW YuntaDATE COMPLETED : 1967ABBREVIATED LOG : see above.

REFERENCES : Baratta GML 147 Cominco : D.M. ENV. 120/67
 Can. Zinc File 1958-60 : D.M. ENV. 57 (P.G. Seale, NSHC)
 Cominco GML 102 : D.M. ENV. 31/66 (L.G. Nixon)

REMARKS : Hole Soffered 55° on bearing of 332° magnetic.
 Purpose of Drilling to investigate possible
 galena mineralization at depth in vicinity of
 old Cross Canada and Rutaby workings and to
 assess for Cu in unexposed Tindellina shale [elite correlated with (P. anomalies)]

approx. log only. (see D.M. ENV. 120/67 for X-section)

0-25 river gravels + alluvium

25-65 carbonaceous wavy bedded siltst. & c/s

65-130 brown sandst., soft, massive; narrow beds
carbonaceous phyllite130-150 brown g/fite; some narrow carbon.
clay bands.150-180 indurated brown sandstones, MnO₂180-210 soft sandstone with mudstone bands
and hard ferrug. bands carrying MnO₂

210-250 carbonaceous siltstone (as for 25-65)

250-280 as for 65-130

280-295 as for 150-180

295-425 as for 65-130

425-450 calc. carb. sandstone

450-523 siltstone & sandstone

fresh pyrite first observed at 300'

Pyrite content from 300'-523' T.D. varies
from 41 to 3% volume.

LATITUDE LONGITUDE

BORE HOLE RECORD

INDEX NO.

27° 14'

133° 36'

NAME OF BORE/WELL: MARLA BORE

GEOLOGIC AREA : BETWEEN OFFICER / PEDIRKA BASINS

_____ :

_____ :

_____ :

NOTES ON LOCATION :DATE COMPLETED :ABBREVIATED LOG : 0-Q-94 - ? O.R. - 339 T.D.REFERENCES : DFM Stat. Bore 347REMARKS :

BORE HOLE ASSAYS

352
INDEX NO.

[illegible]

ASSAY TECHNIQUE: A/A: MODEL TOR NO. 2373/72

LATITUDE LONGITUDE
APPROX. ONLY

BORE HOLE RECORD

INDEX NO.

23° 40'S

131° 11'E

NAME OF BORE/WELL: MALBOOMA COAL BORES 1,2,3,5

GEOLOGIC AREA : GAWLER CRATON

_____ :

_____ :

_____ :

NOTES ON LOCATION : In an area approx. 22.5 miles west of Tancoola ; Mulgathing Station.

DATE COMPLETED : 1959-61

ABBREVIATED LOG :

REFERENCES : Mining Rev. 116 p45.
D ↑ M 779/59 : 21/2/58.
(E.R. Hillwood)

REMARKS :

Hole positions not given in MR116.

HOLE 1 0-27 Trav. 1/5 + clay
27-59 clay, limonitic, sandy layers
59-69 black and brown carbon.
clay 59' & 69' with silty
and mic. clay bands between
69-155 carbon. clay & lignite
155-193 sand & decomp. gneiss
193-225 granite gneiss

HOLE 2 0-25 sand, 1/5, sandy clay
25-58 weath. granite

HOLE 3 0-99 sand, calc. sandy clay,
gritty towards base
99-153 weath. granite

HOLE 4 0-77 clay, siltstone
77-135 weath. granite

HOLE 5 0-76 sand, clay
76-123.5 weath. granite

BORE HOLE ASSAYS

INDEX NO.

			NAME OF BORE/WELL: MALBOOMA NO.1												
	Footage		Sample Type	Lithology	Formation	Cu	Pb	Zn	Ag	Mo	U				
Assay No.	From	To				p.p.m.	p.p.m.	p.p.m.	p.p.m.	p.p.m.	p.p.m.				
25765	30	60	CUTTINGS	See M.B. 116.		5	10	15	<1	<3	-				
25766	60	80				10	10	230	<1	<3	-				
25767	80	100				5	<5	10	<1	<3	-				
25768	100	120				70	25	85	<1	<3	3				
25769	120	140				45	25	35	<1	<3	<2				
25770	140	160				25	25	45	<1	<3	-				
25771	160	180				30	25	120	<1	<3	-				
25772	180	200				150	25	75	<1	<3	-				
25773	200	222				110	20	110	<1	<3	8				
ASSAY TECHNIQUE: A/P AMDEL JOB NO. 276/72															

- : not assayed.

BORE HOLE ASSAYS

INDEX NO.

			NAME OF BORE/WELL: MALBOOMA NO. 2.											
	Footage		Sample Type	Lithology	Formation	Cu	Pb	Zn	Ag	Mo				
Assay No.	From	To				p.p.m.	p.p.m.	p.p.m.	p.p.m.	p.p.m.				
25774	20	40	CUTTINGS	See m.p. 116		15	15	25	<1	<3				
25775	40	52	"			15	10	40	<1	<3				

ASSAY TECHNIQUE: A/AAMDEL JOB NO. 2761/72

[illegible]

BORE HOLE ASSAYS

359
INDEX NO.

			NAME OF BORE/WELL: MALBOOMA NO. 5													
	Footage		Sample Type	Lithology	Formation	Cu	Pb	Zn	Ag	Mo	U					
Assay No.	From	To				p.p.m.	p.p.m.	p.p.m.	p.p.m.	p.p.m.	p.p.m.					
25776	80	100	CUTTINGS	See M.R. 116		50	25	30	<1	3						
25777	100	123	"			15	20	65	<1	3	4					
ASSAY TECHNIQUE: A/PAMDEL JOB NO. 2761/72																

STUART SHELF

E. & W. S. BEDA BORE

D.M. BUTE D.D.H. No.5

CLARENCE RIVER BASIN OIL WOOMERA No.1

D.M. ROOPENA STRATIGRAPHIC D.D.H. No.1

With reference to the Pernatty Lagoon
(Mt. Gunson Mine) Cu - Mn - Ba mineralization
and the Pandurra Copper Prospect.



BORE HOLE ASSAYS

			NAME OF BORE/WELL: BEDA BORE												
	Footage		Sample Type	Lithology	Formation	Cu	Pb	Zn	Ag						
Assay No.	From	To				p.p.m.	p.p.m.	p.p.m.	p.p.m.						
101	?	?	fragments			15	20	230	<1						
102	"	"	"			20	20	230	<1						
103	"	"	"			15	20	230	<1						
104	"	"	"			15	20	230	<1						
105	"	"	"			25	20	190	<1						
106	"	"	"			20	20	190	<1						
107	"	"	"			25	20	180	<1						
108	"	"	"			20	20	180	<1						
109	"	"	"			25	20	180	<1						
110	"	"	"			20	20	190	<1						
111	"	"	"			25	20	200	<1						
112	"	"	"			30	25	180	<1						
ASSAY TECHNIQUE: AMDEL JOB NO. 2373/72															

BORE HOLE ASSAYS

INDEX NO.

			NAME OF BORE/WELL: BEDA BORE												
	Footage		Sample Type	Lithology	Formation	Cu	Pb	Zn	Ag.						
Assay No.	From	To				pp.m.	pp.m.	pp.m.	pp.m.						
113	?	?	fragments			25	25	160	<1						
114	"	"	"			25	20	160	<1						
115	"	"	"			25	25	220	<1						
116	"	"	"			20	25	170	<1						
117	"	"	"			20	25	160	<1						
118	"	"	"			25	25	160	<1						
119	"	"	"			30	25	170	<1						
120	"	"	"			30	25	170	<1						

ASSAY TECHNIQUE: AMDEL JOB NO. 2373/72

FORM 6 JOB

953/72

TT	Analytical Sample No.	Petrological Sample	ppm Cu	depth in feet	Pb	Zn	Petrography
1	A 991/11	P925/71	10	120'	10	100	altered igneous rock
2	80	... 6 ...	15	130'	10	55	" " "
3	81	... 7 ...	(120)	150'	10	35	metasiltstone
4	82 X	... 8 ...	30	200'	15	85	" " "
5	83	... 9 ...	(710)	300'	15	85	altered porphyritic volcanic (andesite?)
6	84	P830/71	10	400'	15	150	chloritized igneous rock (volcanic?)
7	85	... 1 ...	10	500'	5	35	metasiltstone
8	86	2	(150)	525' 2"	10	35	metasiltstone / contains altered igneous
9	87	3	95	550'	(20)	120	altered dolomite or amphibolite
10	88	4	10	600'	15	140	chloritized amphibolite
11	STD 52						
12	89	5	65	657'	(20)	140	chloritized amygdaloidal basalt
13	90	6	(230)	672'	(45)	130	altered basic volcanic
14	A 991/71	P937/71	15	693'	10	100	metasiltstone
15	82 X						
16	BLANK		—		—	—	
17							Code C1
18							
19							Results in ppm
20							

Bute. Stratigraphic D.D. Hole. No. 5
 Summary of Log. - B.P. Thomson, SA. Dept.

from to
 0' - 69'
 69' - 118'
 118' - 133'
 133' - 525' 2"
 525' 2" - 693'
 693' - 701'

Sand + clay - (Quaternary)
 Weathered Dolomite - (Cambrian)
 Altered basic igneous rock. (Precambrian)
 Metasiltstone and altered basic volcanics,
 Amphibolite, ^{basic volcanics} and metasiltstone
 Metasiltstone

END OF HOLE

1119.
 1190.

Intersected by Aserco
 panned by Aserco

LATITUDE LONGITUDE

BORE HOLE RECORD

INDEX NO.

NAME OF BORE/WELL: BUTE D.D.H. 5

GEOLOGIC AREA : YORKE PENINSULA

_____ :

_____ :

_____ :

NOTES ON LOCATION :DATE COMPLETED : 1971ABBREVIATED LOG :

0-69 sand & clay (Quaternary)

69-118 weathered siltstone (Cambrian)

118-133 altered basic igneous rock (Precambrian)

133-525.2 metasilstone and altered basic volcanics.

525.2-693 amphibolite, basic volcanics and metasilstone.

693-701 metasilstone.

END OF HOLE

REFERENCES :

Verba & B. Thompson DTM.

REMARKS :

Provisional log by B. Thompson, S.A. DTM.

BORE HOLE ASSAYS
(By courtesy SA 50 PM - refer B. Thompson)

		NAME OF BORE/WELL: BUTE NO. 5									
Assay No.	Footage		Sample Type	Lithology	Formation Petrology sample.	Cu	Pb	Zn			
	From	To				p.p.m.	p.p.m.	p.p.m.			
A 979/71		120	CORR	alt. ign. rock.	P 925/71	10	10	100			
A 980/71		130		alt. ign. rock.	P 926/71	15	10	55			
A 981/71		150		metasiltstone	P 927/71	120	10	35			
A 982/71		200		metasiltstone	P 928/71	30	15	85			
A 983/71		300		alt. porph. volc. (andesite?)	P 929/71	710	15	85			
A 984/71		400		chlor. ign. rock (volcanic?)	P 930/71	10	15	150			
A 985/71		500		metasiltstone	P 931/71	10	5	35			
A 986/71		525.2		metasiltstone/ alt. ign. contact	P 932/71	150	10	35			
A 987/71		550		alt. dolerite or amphibolite	P 933/71	95	20	120			
A 988/71		600		chloritised amphibolite	P 934/71	10	15	140			
A 989/71		657		alt. basic volc.	P 935/71	65	20	140			
A 990/71		672		alt. basic volc.	P 936/71	230	45	130			

ASSAY TECHNIQUE: A/AMDEL JOB NO. 953/72

A 991/71	693	metasiltstone	P 937/71	15	10	100
----------	-----	---------------	----------	----	----	-----

BORE HOLE ASSAYS

INDEX NO.

		NAME OF BORE/WELL: BUTE NO. 5												
Assay No.	Footage		Sample Type	Lithology	Formation	Cu	Pb	Zn	Co	Ni	Mn			
	From	To				p.p.m.	p.p.m.	p.p.m.	p.p.m.	p.p.m.	p.p.m.			
26201	69	74.5	CORR	weath. dol. (sulph.?)	Cambrian	15	10	75	10	10	3600			
26202	80.2	90		"		420	70	200	20	25	1.8%			
26203	99.5	101		"		1500	260	420	85	60	1700			
26204	106	115		"		110	<5	30	<5	30	140			
26205	115	118		basal conglom. of dol.		10	<5	35	<5	40 30	340			
26206	118	125.8		alt. basic ign. rock	Precambrian	10	<5	120	20	70	1400			
26207	125.8	134		"		35	<5	100	20	70	1300			
26208	134	140		metasiltstone		140	10	55	20	50	820			
26209	140	150		"		95	5	50	10	35	520			
26210	150	160		"		50	5	35	15	40	200			
26211	160	170		" ?		20	10	45	20	40	260			
26212	170	180		"		90	10	60	20	40	570			

ASSAY TECHNIQUE: A/P AMDEL JOB NO. 3107/72 Batch 12

N.B. 26212 contaminated with Zn from sampling device.

BORE HOLE ASSAYS

376
INDEX INC.

			NAME OF BORE/WELL: BUTTE NO. 5											
Assay No.	Footage		Sample Type	Lithology	Formation	Cu	Pb	Zn	Co	Ni	Mn			
	From	To				p.p.m.	p.p.m.	p.p.m.	p.p.m.	p.p.m.	p.p.m.			
26225	300	310	COAR	Basic volc.	Precamb.	150	5	100	20	50	1600			
26226	310	320				2200	10	80	30	40	1900			
26227	320	330				2900	5	65	30	30	5100			
26228	330	340				65	5	75	30	55	590			
26229	340	350				15	5	65	20	50	520			
26230	350	360				10	5	65	25	50	1110			
26231	360	370				15	15	110	25	50	1160			
26232	370	380				35	10	95	25	50	1180			
26233	380	390				100	10	100	40	50	1700			
26234	390	400				120	5	120	50	85	1600			
26235	400	410				120	10	100	50	55	1800			
26236	410	420				100	10	120	60	75	11400			

ASSAY TECHNIQUE: AAANDEL JOB NO. 26225:- 3107/72 Batch 12
26226 - 26236 :- Batch 13, 3107/72.

BORE HOLE ASSAYS

377
INDEX INC.

		NAME OF BORE/WELL: BUTTE NO. 5												
Assay No.	Footage		Sample Type	Lithology	Formation	Cu	Pb	Zn	Co	Ni	Mn			
	From	To				p.p.m.	p.p.m.	p.p.m.	p.p.m.	p.p.m.	p.p.m.			
26237	420	430	CORE	Basic volc.	Precambrian	55	10	120	55	80	2400			
26238	430	440		metagabbro?		180	10	85	110	55	740			
26239	440	450		"		70	10	70	25	35	1600			
26240	450	460		"		40	10	80	15	35	1170			
26241	460	470		"		55	5	35	15	30	720			
26242	470	480		"		55	5	35	15	25	910			
26243	480	490		"		130	30	35	15	30	1600			
26244	490	500		"		60	5	15	10	20	340			
26245	500	510		"		50	5	30	10	35	260			
26246	510	520		"		220	10	55	10	35	1110			
26247	520	530		"		100	10	50	20	40	930			
26248	530	540		Basic volc.		600	10	80	25	60	770			

ASSAY TECHNIQUE: A/A AMDEL JOB NO. 3107/77 Batch 13, 14.

BORE HOLE ASSAYS

378
INDEX INC.

			NAME OF BORE/WELL: BUTE NO. 5											
	Footage		Sample Type	Lithology	Formation	Cu	Pb	Zn	Co	Ni	Mn			
Assay No.	From	To				p.p.m.	p.p.m.	p.p.m.	p.p.m.	p.p.m.	p.p.m.			
26249	540	550	CORE	basic volc.	Precamb.	65	10	120	35	70	670			
26250	550	560		basic volc. ± chalcopy.		130	10	120	35	80	1500			
26251	560	570		basic volc. tr. cpy.		80	5	110	30	70	720			
26252	570	580		basic volc.		120	70	140	35	80	1300			
26253	580	590		"		90	10	150	35	90	890			
26254	590	600		basic volc. tr. cpy.		250	5	100	35	85	1300			
26255	600	610		" tr. cpy.		510	5	120	35	85	930			
26256	610	620		metasiltstone		130	10	140	55	55	900			
26257	620	630		basic volc.		10	15	160	50	35	1200			
26258	630	640		"		15	10	180	50	35	930			
26259	640	650		"		95	20	200	60	110	960			
26260	650	660		"		90	20	180	55	110	1800			

ASSAY TECHNIQUE: A/A ANDEL JOB NO. 3107/72 BATCH 14.

BORE HOLE ASSAYS

[illegible]

TITUDE LONGITUDE

BORE HOLE RECORD

INDEX NO.

NAME OF BORE/WELL: WOOMERA BORE

GEOLOGIC AREA : STUART SHELF

_____ :

_____ :

_____ :

NOTES ON LOCATION : NW of Mt. GunsonDATE COMPLETED : 1958, Clarence River Basin Oil.ABBREVIATED LOG : 0-12' Recent soil ; 12'-263' Corraberra Sandstone equivalent - red sandy siltstone and f.g. red sandstone.
(after Thompson 1968)

263'-785' Woomera shale - red and green laminated siltstone and shale. 785'-1119' Whyalla Sandstone - red, pink and cream f.g.-m.g. feldspathic sandstone. || DISCONFORMITY || 1119' - 1490' Wooralla Dolomite - dark grey laminated dolomite and siltstone || DISCONFORMITY || Pandurra formation 1490' - 2006'.

REFERENCES :

Thompson B.P. & Johnson J.E., 1968. Marinoan Stratigraphy, Port Augusta Region: Quant. geol. notes 286. S.S.A.

REMARKS :

BORE HOLE ASSAYS

381
INDEX NO.

			NAME OF BORE/WELL: WOOMERA BORE											
say No.	Footage		Sample Type	Lithology as apparent during sampling	Formation	Cu	Pb	Zn	Co	Ni	Mn			
	From	To				p.p.m.	p.p.m.	p.p.m.	p.p.m.	p.p.m.	p.p.m.			
26001	10	23	CORE	shale/siltstone	Unnamed member -	25	15	100	20	35	970			
26002	23	30		shale	Corraberra Sandstone member of	25	15	110	20	35	1000			
26003	30	36		shale	Tent Hill Formation.	25	10	90	20	30	1300			
26004	36	46		shale		50	15	100	20	35	1000			
26005	46	56		shale		30	10	90	20	35	1200			
26006	56	66		shale	Red sandy siltstone and f.g. red sandstone, sedimentary	50	10	90	20	35	1200			
26007	66	76		shale	Flump structures	30	15	90	20	35	1200			
26008	76	86		shale	Small scale crossbedding.	5	15	90	20	35	1200			
26009	SAMPLE NUMBER NOT USED													
26010	86	90		shale		5	10	75	15	30	680			
26011	90	100		shale		5	< 10	35	10	15	690			
26012	100	110		shale		30	10	100	20	35	1000			

AY TECHNIQUE: A/PADEL JOB NO. 3107/72 Batch 1

BORE HOLE ASSAYS

382
INDEX INC.

NAME OF BORE/WELL: WOOMERA BORE

Core Sample No.	Footage		Sample Type	Lithology	Formation	Cu	Pb	Zn	Co	Ni	Mn				
	From	To				p.p.m.	p.p.m.	p.p.m.	p.p.m.	p.p.m.	p.p.m.				
6013	110	120	CORE	shale	Corraberri Sandstone Equivalent.	25	10	250	20	30	1100				
6014	120	130		shale		75	10	320	20	35	1300				
6015	130	140		shale		85	10	175	20	35	1100				
6016	140	150		shale/conglom.		20	10	90	10	15	890				
26017	150	160		shale/arkose		50	10	170	20	35	1500				
26018	160	170		sand/conglom.		10	5	80	15	30	800				
26019	170	180		sandy conglom.		5	5	80	10	20	700				
26020	180	190		shale/sandstone		5	5	95	20	30	2200				
26021	190	200		shale-sandst.		5	10	100	15	20	1000				
26022	200	210		shale		5	10	180	10	15	100				
26023	210	220		fine-sandst./siltstone		5	10	80	5	10	45				
26024	220	240		shale		5	10	110	15	25	110				

ANALYTICAL TECHNIQUE: A/ANDEL JOB NO. 3107/72 Batch 2.

BORE HOLE ASSAYS

INDEX NO.

			NAME OF BORE/WELL: WOOMERA BORE											
ay No.	Footage		Sample Type	Lithology	Formation	Cu	Pb	Zn	Co	Ni	Mn			
	From	To				p.p.m.	p.p.m.	p.p.m.	p.p.m.	p.p.m.	p.p.m.			
6025	230	240	CORE	shale/sandst.	Corraberra	5	10	130	20	30	260			
6026	240	250		siltstone/shale	Sandstone Equivalent.	5	15	110	20	35	180			
6027	250	260		" "	263' Woomera Shale.	5	10	100	20	35	180			
6028	260	270		" "		5	10 15	80 110	20	35	280			
6029	270	280		" "		35	5	75	20	35	290			
6030	280	290		" "		40	5	80	20	30	380			
6031	290	300		shale		5	10	90	20	35	300			
6032	300	310		"		5	10	110	20	35	310			
6033	310	320		"		10	10	90	20	35	320			
6034	320	330		"		5	10	75	20	40	300			
6035	330	340		"		10	5	90	20	35	340			
6036	340	350		"		100	10	95	20	35	320			

Y TECHNIQUE: A/A AMDEL JOB NO. 3107/72 Batd 2.

BORE HOLE ASSAYS

INDEX NO.

			NAME OF BORE/WELL: WOOMERA BORE											
say No.	Footage		Sample Type	Lithology	Formation	Cu	Pb	Zn	Co	Ni	Mn			
	From	To				p.p.m.	p.p.m.	p.p.m.	p.p.m.	p.p.m.	p.p.m.			
6037	350	360	CORE	shale	Woomera Shale	5	10	95	20	35	320			
26038	360	370		"	Red green laminated siltstone and shale.	10	10	90	20	35	320			
26039	370	380		"		25	10	95	20	35	330			
26040	380	390		"		30	10	95	20	35	360			
26041	390	400		"		10	10	120	15	35	360			
26042	400	410		"		5	15	140	15	35	330			
26043	410	420		"		5	15	90	20	40	340			
26044	420	430		"		10	10	90	20	40	340			
26045	430	440		"		5	10	100	20	35	340			
26046	440	450		"		40	10	95	20	40	370			
26047	450	460		"		50	10	130	20	35	380			
26048	460	470		shale turbidites		40	10	95	20	40	380			

AY TECHNIQUE: A/ A AMDEL JOB NO. 3107/72 Batch 3.

BORE HOLE ASSAYS

			NAME OF BORE/WELL: WOOMERA BORE												
	Footage		Sample Type	Lithology	Formation	Cu	Pb	Zn	Co	Ni	Mn				
Assay No.	From	To				p.p.m.	p.p.m.	p.p.m.	p.p.m.	p.p.m.	p.p.m.				
26048	470	480	CORE	shale	WOOMERA SHALE	50	10	120	20	40	370				
26050	480	490		"	"	30	5	90	20	40	480				
26051	490	500		"	"	30	5	90	20	35	520				
26052	500	510		"	"	10	10	110	20	40	440				
26053	510	520		purple-green shale	"	30	10	75	20	35	500				
26054	520	530		shale	"	5	5	95	20	35	400				
26055	530	540		"	"	5	10	100	20	40	460				
26056	540	550		"	"	5	5	90	15	40	380				
26057	550	560		"	"	5	10	90	20	40	410				
26058	560	570		"	"	5	5	100	15	35	390				
26059	570	580				5	10	95	15	40	340				
26060	580	590				5	10	95	20	40	380				

ASSAY TECHNIQUE: NA ALDEL JOB NO. 310772 Batch 2+3+4.

BORE HOLE ASSAYS

INDEX NO.

			NAME OF BORE/WELL: WOOMERA BORE											
say No.	Footage		Sample Type	Lithology	Formation	Cu	Pb	Zn	Co	Ni	Mn			
	From	To				p.p.m.	p.p.m.	p.p.m.	p.p.m.	p.p.m.	p.p.m.			
26061	590	600	CORE	shale	WOOMERA SHALE	5	10	100	20	40	390			
26062	600	610		"		5	10	95	20	40	340			
26063	610	620		"		5	5	95	15	40	390			
26064	620	630		"		15	5	90	20	40	350			
26065	630	640		"		50	5	95	20	35	720			
26066	640	650		"		25	5	90	20	40	480			
26067	650	660		"		10	10	95	20	50	340			
26068	660	670		"		5	10	95	20	50	350			
26069	670	680		"		5	10	90	15	40	430			
26070	680	690		"		5	10	95	20	40	380			
26071	690	700		"		5	15	100	20	40	390			
26072	700	710		"		5	15	100	15	40	440			

AY TECHNIQUE: AARDEL JCB NO. 3107/72 B.A.D. 445

38.
INDEX NO.

Footage			Sample Type	Lithology	Formation	Cu	Pb	Zn	Co	Ni	Mn				
Assay No.	From	To				p.p.m.	p.p.m.	p.p.m.	p.p.m.	p.p.m.	p.p.m.				
26073	710	720	CORE	shale	Woomera SHALE	5	15	100	20	40	440				
26074	720	730				5	15	110	20	35	450				
26075	730	740				5	25	130	20	40	510				
26076	740	750				5	25	140	20	40	740				
26077	750	760				5	25	130	20	40	670				
26078	760	770				5	25	120	15	35	1300				
26079	770	784				5	25	110	15	40	1700				
26080	784	791		feldspathic sandstone	Parnatty Grit	5	15	95	<5	10	660				
26081	791	800		gritty sandstone		5	<5	30	<5	5	1300				
26082	800	810				5	<5	70	<5	<5	740				
26083	810	820		grit		5	<5	45	<5	<5	740				
26084	820	830				5	<5	60	<5	<5	750				

ASSAY TECHNIQUE: A/A ANDEL JOB NO. 3107/72 Batch 445

BORE HOLE ASSAYS

INDEX NO.

			NAME OF BORE/ WELL: WOOMERA BORE											
Assay No.	Footage		Sample Type	Lithology	Formation	Cu	Pb	Zn	Co	Ni	Mn			
	From	To				p.p.m.	p.p.m.	p.p.m.	p.p.m.	p.p.m.	p.p.m.			
26097	970	980	CORE	grit	PERNATTY GRIT	10	5	120	<5	5	630			
26098	980	1000				10	<5	50	<5	5	540			
26099	1000	1040				15	10	130	<5	5	560			
26100	1040	1060				5	<5	60	<5	<5	910			
26101	1060	1070				5	5	75	<5	10	1700			
26102	1070	1080				5	5	110	<5	10	840			
26103	1080	1090				5	5	130	<5	15	490			
26104	1090	1100				5	45	70	<5	10	910			
26105	1100	1105				200	100	320	<5	10	1400			
26106	1105	1110				10	80	95	<5	10	2300			
26107	1110	1115						Lost SAMPLE						
26108	1115	1119				25	10	90	<5	30	4600			

ASSAY TECHNIQUE: A/A ANDERSON JOB NO. 3107/72 Batch 6

BORE HOLE ASSAYS

INDEX NO.

			NAME OF BORE/WELL: WOOMERA BORE												
	Footage		Sample Type	Lithology	Formation	Cu	Pb	Zn	Co	Ni	Mn				
Assay No.	From	To				b.p.m.	b.p.m.	b.p.m.	b.p.m.	b.p.m.	b.p.m.				
26109	1119	1125	CORE	1119' DISCONTINUITY grey shale shale 											

BORE HOLE ASSAYS

INDEX NO.

			NAME OF BORE/HOLE: WOOLMERA BORE												
Assay No.	Footage		Sample Type	Lithology	Formation	Cu	Pb	Zn	Co	Ni	Mn				
	From	To				l.p.m.	l.p.m.	l.p.m.	l.p.m.	l.p.m.	l.p.m.				
26121	1230	1240	CORE	shale	WOOLMERA DOLOMITE EQUIV.	20	80	680	15	40	1600				
26122	1240	1250				20	80	710	10	35	2100				
26123	1250	1265				25	160	220	10	40	11400				
26124	1265	1280				20	80	380	10	40	1300				
26125	1280	1290				20	270	1150	15	40	1300				
26126	1290	1300				60	60	1140	15	40	910				
26127	1300	1310				30	70	310	20	40	910				
26128	1310	1320				30	55	360	20	50	910				
26129	1320	1330				30	75	340	20	30	870				
26130	1330	1340				25	55	210	20	30	700				
26131	1340	1350				50	45	110	15	40	760				
26132	1350	1360				40	50	270	15	40	720				

ASSAY TECHNIQUE: AA AMDEL JOB NO. 3107/72 3.1.12 708.

BORE HOLE ASSAYS

INDEX NO.

			NAME OF BORE/WELL: BOOMERA BORE												
Footage		Sample Type	Lithology	Formation	Cu	Pb	Zn	Co	Ni	Mn					
Assay No.	From				To	p.p.m.	p.p.m.	p.p.m.	p.p.m.	p.p.m.	p.p.m.				
26133	1360	1370	CORE	shale	Woolalla Dolomite Equiv.	30	50	160	15	40	680				
26134	1370	1380				30	50	75	15	30	720				
26135	1380	1390				30	110	110	15	30	760				
26136	1390	1410				25	20	120	5	30	1500				
26137	1410	1430				25	20	80	15	30	1300				
26138	1430	1450				30	50	190	15	30	1500				
26139	1450	1460				110	100	65	15	110	2400				
26140	1460	1470				35	90	230	15	30	3100				
26141	1470	1480				30	80	170	10	30	4000				
26142	1480	1485				30	160	100	15	25	5800				
26143	1485	1490		35	150	390	15	20	170						
26144	1490	1495		1490 DISCONFORMITY gltite-grit Fernally Grit		80	30	220	<5	20	9300				
ASSAY TECHNIQUE: AA ANDEL JOB NO. 3107/72 PAGE 8.															



ASARCO (AUSTRALIA) PTY. LTD.

INCORPORATED IN QUEENSLAND AS A WHOLLY OWNED SUBSIDIARY
OF AMERICAN SMELTING AND REFINING COMPANY

394

190 HAY STREET EAST
PERTH
WESTERN AUSTRALIA 6000
TELEPHONE: PERTH 25 9533
CABLES: "ASARCO PERTH"

PLEASE ADDRESS MAIL TO:
ASARCO (AUSTRALIA) PTY. LTD.
P.O. BOX 6010
HAY STREET EAST, PERTH 6000
WESTERN AUSTRALIA

October 8, 1974.

The Director of Mines,
Department of Mines of South Australia,
Box 38, Rundle Street P.O.,
SOUTH AUSTRALIA, 5000.

Dear Sir,

YOUR REFERENCE DM.131/71 BPT:PAL

In reply to your letter of the 27th September, the
missing figures from Mr. Warne's report on the Woomera No. 1
bore are as follows:

<u>Sample No.</u>	<u>Interval</u>		<u>Cu</u>	<u>Pb</u>	<u>Zn</u>	<u>Co</u>	<u>Ni</u>	<u>Mn</u>
	<u>Feet</u>							
A26157	1600	-1610	<5	5	55	<5	5	85
58	1610	-1620	<5	<5	45	<5	5	75
59	1620	-1632	5	5	45	<5	5	75
60	1632	-1642	<5	5	65	<5	5	75
61	1642	-1654	<5	5	55	<5	10	95
62	1654	-1665	<5	5	55	<5	10	95
63	1665	-1677.5	<5	<5	30	<5	5	100
64	1677.5	-1688	5	<5	25	<5	5	110
65	1688	-1700	10	<5	30	<5	10	100
66	1700	-1720	5	<5	50	<5	10	110
67	1720	-1732	5	<5	40	<5	10	130
68	1732	-1744	5	<5	30	<5	20	130

All values are in parts per million.

If any further omissions are found, please do not
hesitate to bring them to my attention so that the figures
can be supplied if possible.

Yours faithfully,

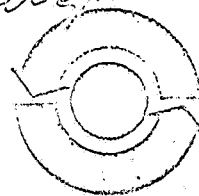
Michael Kriewaldt

M. Kriewaldt

NOTED
ref.

THE AUSTRALIAN MINERAL DEVELOPMENT CORPORATION

Handwritten signature
P. A. Young



PLEASE ADDRESS ALL CORRESPONDENCE TO THE DIRECTOR.

OUR REFERENCE: MP1/13/0

YOUR REFERENCE:

11th December, 1967

397

The Director,
S.A. Department of Mines,
Box 38, Rundle Street P.O.,
ADELAIDE, 5001.

REPORT MP1152-68

YOUR REFERENCE:	Application dated 11/10/67
MATERIAL:	Drill Core Samples (8)
LOCALITY:	Roopena Diamond Drill Hole No.1 (Footages as listed)
IDENTIFICATION:	P502/67 - P509/67
DATE RECEIVED:	11/10/67
WORK REQUIRED:	Petrographic descriptions.

Investigation and Report by: A.R. Turner

Acting Officer in Charge, Mineralogy Section: N.A. Trueman

P.A. Young
Director.

INVESTIGATION OF THE ROOPENA VOLCANICS

PART 7

1. INTRODUCTION

The samples described in this report were obtained from Roopena Diamond Drill Hole No.1 between the 428 feet 6" and 490 feet 5" level. One sample of rock chips from Beda Bore believed to belong to the Roopena Volcanics is described.

Those carbonates described as calcite have been identified by microchemical staining techniques. Those described as carbonates did not stain and thus are some other carbonate than calcite.

2. PETROGRAPHY

Sample P502/67 (Top) TS19938

Location:

428 feet 6 inches - 428 feet 7½ inches.

Rock Name:

Completely replaced ?volcanic rock.

Hand Specimen:

A pale fawn, massive and intensely chloritized volcanic rock. This rock grades rather abruptly into P502 described from the base of this section of the core. The contact between the two rocks is at approximately 45° to the axis of the core.

Thin Section:

A visual estimate of the constituents gives the following:

	<u>%</u>
Carbonate	35
Epidote	20
Chlorite	25
Quartz	10
Clay minerals	10
Andesine	Accessory
Opagues	Accessory
Sphene	Accessory

This sample is completely altered and displays no relict textures that could provide an indication as to the nature

2.

of the primary rock type. The rock is composed predominantly of masses of crystalline carbonate, only traces of which are calcite, set in a mass of chlorite, epidote and secondary silica. Clay minerals are also abundant. The only relict mineral that has survived this period of alteration is a trace of the plagioclase andesine. One crystal shape that can be interpreted as a completely pseudomorphed phenocryst of feldspar was found. This crystal is now composed of a rim of carbonate enclosing a core of microcrystalline clay minerals.

Special Features:

The presence of former feldspar phenocrysts and relict andesine would suggest that this rock is a severely altered porphyritic andesite. The alteration may be related to ground-water solutions percolating along the contact with the sediments at the base of the volcanic sequence.

History:

Igneous ?extrusive. Extensively altered.

Sample P502/67: (Bottom) TS19989

Location:

428 feet 7 1/2 inches - 428 feet 9 inches.

Rock Name:

An altered, porphyritic, amygdaloidal ?andesite.

Hand Specimen:

A fine-grained, massive, bleached, strongly amygdaloidal volcanic rock. The rock has a pale fawn colouration and the amygdules are deep green. Some minor fractures traverse the sample.

Thin Section:

This rock compositionally resembles the previous sample, however, relict textural features are better preserved and allow an interpretation of the nature of the primary rock. Amygdules are common and occupy some 30% of the sample. These are generally formed of a rim of carbonate enclosing a core of fine-grained, pale-green chlorite. Clay minerals and minor silica may occur in smaller amounts. The host is almost completely altered but can be seen to have been composed of a felted mass of subradiating plagioclase laths that are now completely replaced by carbonate and chlorite. Former phenocrysts of feldspar have a random distribution.

Special Features:

This rock is probably closely related to the previously described sample. The alteration is similar in nature and origin.

History:

Igneous extrusive. Severely altered.

Sample P503/67 (Top): TS19990

Location:

430 feet 1 inch - 430 feet 2 inches.

Rock Name:

Altered, amygdaloidal, porphyritic ?andesite.

Hand Specimen:

A fine-grained, amygdaloidal, mottled green rock. The sample is in contact with a darker clastic rock. The contact is at an angle of approximately 30° to the core axis.

Thin Section:

A visual estimate of the constituents gives the following:

	<u>%</u>
Clay minerals	30
Carbonate	20
Chlorite	30
Epidote	3
Hydrated-iron oxides	15
Opakes	2

The rock is composed of an altered mass of subradiating plagioclase laths that have been variously replaced by carbonate and/or clay minerals. The interstitial areas are occupied by chlorite, carbonate, disseminated opakes and minor epidote. There is a tendency for the grain-size to coarsen as the contact with a clastic sandstone is approached, and hydrated iron-oxides and opakes increase in abundance towards the contact. Amygdules are quite common and are usually formed of a rim of chlorite enclosing a core of carbonate. Occasionally a fibrous, radiating clay mineral occupies the amygdules.

At a distance of approximately 10 mm from the contact a structure becomes evident. Here there is an alignment of the plagioclase laths which parallels the plane of the contact. This structure becomes more marked as the contact is approached. Immediately at the contact the structure disappears and the rock assumes the habit of an altered devitrified glass. The contact is quite sharp.

History:

Igneous extrusive and subsequently altered. The contact appears concordant although evidence for this is somewhat speculative.

Sample P503/67 (Bottom): TS19991

Location:

430 feet 2 inches - 430 feet 4 inches.

Rock Name:

Coarse-grained, volcaniclastic sandstone.

Hand Specimen:

A medium-grained, dark brownish-grey, massive clastic rock. Minor fractures randomly traverse the rock and are infilled with a secondary carbonate cement.

Thin Section:

A visual estimate of the constituents gives the following:

	<u>%</u>
Igneous rock fragments	60
Quartz	20
Carbonate	5
Clay minerals	10
Hydrated iron-oxides	5

In the main the rock is microscopically massive although there is a slight suggestion of a structure which is defined by the sub-parallel alignment of elongate fragments of quartz. Apart from some of the quartz the clastic components are rounded to sub-angular in shape and have a moderate sphericity. The rock fragments are derived from fine-grained, siliceous, rhyolitic rocks. Many show evidence of having a porphyritic texture. Phenocrysts of high-quartz are commonly included within the rock fragments. Phenocrysts of feldspar are much less common. The most common fragment type is

rhyolitic in composition and composed of a mottled aggregate of alkali feldspar and less commonly plagioclase. Other fragments tend towards the composition of rhyodacites and yet others, although minor, appear to have formed by the alteration and devitrification of an acid glass. Quartz fragments are common and it is possible that many, if not all, were derived from former phenocrysts.

The matrix is composed of hydrated iron-oxides, opaques, chlorite and clay minerals. Occasional flakes of detrital muscovite are found together with minor secondary calcite. Occasional, small fragments of detrital carbonate represent the only obviously sedimentary fragments.

There is a tendency for the grain-size to coarsen with depth down the hole and for the rock fragments to become more complete.

The rock is traversed by a few minor fractures that are infilled with carbonate.

There is no evidence to suggest that this rock may have been subjected to a metamorphic event.

This rock type is very significant in that it petrologically relates this formation to the Corunna Conglomerate. A few fragments of Moonachie Formation - Volcaniclastic phase are preserved in the detritus. These fragments are composed wholly of clastic rhyolitic rock fragments that are cemented together by a little fine-grained sericite. The fragments have been compared with rocks collected by Smale (1966) and are similar in composition and texture. They also appear identical to P526/67 at the bottom of Roopena DDH No.2 to the east of DDH No.1.

History:

Water laid sedimentary rock derived from a rhyolitic area of provenance.

Sample P504/67: TS19992

Location:

431 feet 6 inches - 431 feet 9 inches.

Rock Name:

Coarsely laminated arenaceous siltstone.

Hand Specimen:

A fine-grained, pale-grey, silty rock. The sample has a poor structure defined by variations in the grain-size of the detrital components.

Thin Section:

A visual estimate of the constituents gives the following:

	<u>5</u>
Quartz	35
Carbonate	8
Chlorite	5
Igneous rock fragments	15
Clay minerals	37

The rock is composed of scattered fragments of quartz, carbonate, chlorite and fine-grained igneous rocks the latter of which are identical to those described earlier. A few laths of fine-grained, detrital micas are scattered throughout. Variations in the ratio of fragments to matrix impart a structure which is further enhanced by the sub-parallel alignment of the long axes of the detrital grains. The matrix is essentially composed of clay minerals with lesser amounts of chlorite and very fine-grained quartz grains. In those zones in which there is a deficiency of the coarser-grained clastic components, the orientation of fibrous micas and clay minerals defines the structure. These laths are obviously detrital. All of the detrital components have been derived from a rhyolitic terrain: There is no evidence for any sedimentary fragments.

Sample P505/67: TS19993: TS19994

Location:

432 feet - f32 feet 9 inches.

Rock Name:

Lithic conglomerate.

Hand Specimen:

A conglomerate composed of angular to subrounded rock and mineral fragments set in a fine-grained matrix. Interbedded layers of fine-grained, laminated siltstone have a sub-parallel orientation that defines a prominent structure in the rock. This structure is approximately perpendicular to the core axis.

There is no positive evidence to suggest the rock was composed of igneous rocks or rock fragments.

History:

Sedimentary, deformed and recrystallized.

Sample P508/67: TS19997 - TS19998

Location:

490 feet - 490 feet 2 1/2 inches.

Rock Name:

Fine-grained, acid igneous rock.

Hand Specimen:

A dark reddish-brown mottled rock. The sample is completely massive although there is evidence for incipient deformation.

Thin Section:

The rock is composed of a fine-grained, felsitic mass of feldspar which has been partially reddened. The degree of reddening is variable and imparts the mottled colouration to the rock. The groundmass has a variable grain-size, but there is no consistent variation. Occasional phenocrysts of feldspar are found randomly distributed. Disseminated opaques are common accessory components together with lesser amounts of zircon and apatite. Fracture zones traverse the rock. These have been infilled with a mosaic of crystalline, magmatic quartz and small amounts of opaque minerals. The rock appears to have been subjected to mild deformation immediately after solidification and then been silicified by late-stage magmatic silica. Alteration is too intense to allow adequate identification of the feldspars but it is probable that the sample is rich in potash.

History:

Igneous extrusive.

Sample P509/67: TS19999

Location:

Beda Bore. Torrens 1 mile sheet.

Rock Name:

Pyroxene Basalt.

Hand Specimen:

Dark fine-grained fragments of a massive igneous rock.

Thin Section:

A visual estimate of the constituents from a fresh fragment gives the following:

	<u>%</u>
Plagioclase	60
Opagues	5
Pyroxene	25
Sphene	2
Mica	8

The freshest fragments are composed of fine- to medium-grained subradiating laths of plagioclase with the interstitial areas being occupied by a colourless clinopyroxene (augite). The feldspar is labradorite (An_{50} to An_{60}), crystals of which are partially replaced by muscovite and other colourless micas. Any interstitial areas are occupied by opaque minerals.

The submitted fragments vary in composition, as does the degree of alteration. Some fragments are almost devoid of mafic minerals, and composed wholly of plagioclase feldspar that is partially replaced by carbonate, chlorite and opagues (specular hematite). Although the fresher fragments predominate all gradations between the two extremes are found.

History:

Igneous.

crystals of opaques and angular quartz grains. Clay minerals are very fine-grained and show evidence for diagenetic recrystallization. Occasional mica laths are orientated in the plane of the bedding. Minor amounts of zircon were the only accessories identified. Two opaque mineral phases are present.

The first is pyrite which usually occurs as spherical or sub-spherical crystals which are usually associated with the darker layers in the rock. This implies a syngenetic origin for the pyrite (possibly biological). The second opaque mineral phase is chalcopyrite but this mineral is not closely related to the bedding. In one instance it is clearly related to cross fracturing. Occasionally it replaces pyrite spheroids. The chalcopyrite is definitely not syngenetic but is most likely of hypogene origin. Textural features suggest that the chalcopyrite is not the result of secondary enrichment.

History:

Sedimentary. There is no evidence to suggest a metamorphic event. The recrystallization can be ascribed only to diagenetic processes.

Sample P507/67: TS19996

Location:

477 feet 5 inches.

Rock Name:

A coarse-grained epiclastic lithic greywacke.

Hand Specimen:

A reddish brown, brecciated rock. The sample is completely massive.

Thin Section:

This rock is composed almost wholly of deformed and partially recrystallized quartz-rich sedimentary rock fragments. Each fragment has a pronounced structure defined by planes of deformation along which recrystallization has occurred. Protopogenic relics of the primary rock type are set in a fine-grained groundmass of recrystallized quartz and some sericite. The primary mineral components are severely strained. It is virtually impossible to distinguish the various fragments. The whole rock after consolidation has been subjected to slight deformation.

Thin Section:

A visual estimate of the constituents gives the following:

	<u>5</u>
Framework - ?Moonable Formation	15
- Acid igneous rocks	50
Matrix	35

This rock compositionally and texturally resembles P503 (volcaniclastic phase). The major differences include a marked increase in the number of fragments interpreted as having been derived from the Moonable Formation - volcaniclastic phase, the coarser grain-size, and the presence of graded bedding.

This rock is the first in which sedimentary rock fragments appear in significant proportions. Fragments of carbonate and deformed and recrystallized quartzites appear.

The siltstone interbeds have sharp contacts with the conglomerate. The fragments of which they are composed are consistent with their having been derived by the weathering of acid igneous rock fragments. Quartz fragments, some of which retain crystal faces, are scattered throughout. Zircon crystals are present in accessory amounts.

History:

Sedimentary.

Sample P506/67: TS19995: PS11251

Location:

465 feet 6 inches.

Rock Name:

Mineralized carbonaceous siltstone.

Hand Specimen:

A dark-grey, fine-grained, laminated siltstone. Sulphide minerals are distributed along parting fractures and bedding planes in the rock.

Thin Section:

The rock is composed of a laminated mass of clay minerals. The laminations are accentuated by sub-parallel precipitations of opaque minerals and/or carbonaceous material. Distributed through the clay minerals are finely disseminated and larger

LATITUDE LONGITUDE

BORE HOLE RECORD

INDEX NO.

39° 42' 51"

157° 24' 24"

NAME OF BORE/WELL: DOOPENA STRATIGRAPHIC D.D.H #1.

GEOLOGIC AREA : BARBER PARTFOR

_____ :

_____ :

_____ :

NOTES ON LOCATION : S. H. dyke to 4th.DATE COMPLETED :

0-430' Doopena volcanic (basalt);

BACKY POINT FORMATION

ABBREVIATED LOG :REFERENCES : Trans. Doq. Soc. S. A. Vol. 94 (1973) p. 209-211 B. Thompson.REMARKS : 70 ft. assays.

463-467 ft vert. depth.
 467-469
 475-483-4
 483-4-490

width.
 4.7
 2.
 5.4
 6.6

% C.
 0.35
 0.53
 0.3
 0.3

(S. H. S. by B. Thompson 8/17/71.)

GEOCHEMICAL RESULTS ROOPENA DDH 1 409

Drilled by DM and analyzed by ASARCO.

(PPM)					
INTERVAL (ft)	Cu	Pb	Zn	Ag	
0-10	55	190	270	< 1	
10-20	50	340	300		
20-30	40	270	350		
30-40	40	110	190		
40-50	40	135	100		
50-60	30	15	150		
60-70	40	10	90		
70-80	40	50	180		
80-90	45	20	170		
90-100	35	10	140		
100-110	25	15	130		
110-120	30	10	120		
120-130	170	480	190		
130-140	45	430	190		
140-150	45	45	280		
150-160	20	10	180		
160-170	35	15	120		
170-180	30	5	130		
180-190	35	5	110		
190-200	20	10	110		
200-210	35	55	150	↓	
210-220	30	30	160	3	
220-230	45	20	150	< 1	
230-240	40	120	150		
240-250	30	45	430		
250-260	45	15	130		
260-270	40	15	110		
270-280	50	30	120	↓	
280-290	30	35	150	3	

ROOPESNA DDH1

(ppm)

410

INTERVAL (ft)	C _n	P _g	Z _n	A _g	
290 - 300	30	160	330	21	
300 - 310	45	150	210		
310 - 320	45	160	190		
320 - 330	35	95	220		
330 - 340	55	340	380		
340 - 350	5	40	600		
350 - 360	35	1100	480		
360 - 370	60	5500	440		
370 - 380	60	1000	500		
380 - 390	5	25	460		
390 - 400	15	25	380		
400 - 410	60	250	280		
410 - 420	100	100	160		
420 - 430	120	15	210		
430 - 440	75	15	120		
440 - 450	30	15	75		
450 - 460	160	50	160		
460 - 470	4300	30	40		
470 - 480	900	160	25		
480 - 490	900	40	25		
490 - 500	85	5	15	5	
500 - 511	40	30	20	<1	



amdel

The Australian Mineral Development Laboratories

Flemington Street, Frewville, South Australia 5063
Phone 79 1662, telex AA82520

Please address all correspondence to the Director
In reply quote: **AN3/316/0 - 3961/72**

411

7 March 1972

The Manager
Asarco (Australia) Pty Limited
323 Wakefield Street
ADELAIDE SA 5000

REPORT AN3961/72

YOUR REFERENCE: Order A1743
IDENTIFICATION: A14701 to A14751
DATE RECEIVED: 23/2/72

Enquiries quoting AN3961/72 to Officer in Charge please.

Analysis by: A.E. Francis

Officer in Charge, Analytical Section: A.B. Timms

FRH
for F.R. Hartley
Director

Roopena No1 DDH.

plm

MAP		STATE	SA
GRID			
PROSPECT	Base Hole Survey		
SAMPLER	SBW	FILE	
TYPE	Core dust		

412

ROOPENA NO. 1.

Diamond drill core
BATCH NO. sub scratch
samples (du)

FORM 6

JOB

3961/12

AMDEL ANALYTICAL SERVICE

TT	Sample No.						Feet		
			Cu	Pb	Zn	Hg	From	To	
1	H 14701		55	190	270	<1	0	10	weather volcan
2	2		50	340	300	<1	10	20	"
3	3		40	270	350	<1	20	30	"
4	4		40	110	190	<1	30	40	"
5	5		40	35	100	<1	40	50	"
6	Str 51						5		"
7	6		30	15	150	<1	50	60	"
8	7		40	10	90	<1	60	70	"
9	8		40	50	180	<1	70	80	volcan
10	9		45	20	170	<1	80	90	"
11	10		35	10	140	<1	90	100	"
12	11		25	15	130	1	100	110	"
13	12x		30	10	120	<1	110	120	"
14	13		170	480	190	1	120	130	"
15	14		45	430	190	<1	130	140	"
16	15		45	45	200	<1	140	150	"
17	16		20	10	180	<1	150	160	? pyrit
18	17		35	15	120	<1	160	170	volcan
19	11 14718		30	5	130	<1	170	180	"
20	12 ✓								

FORM 76

JOB

2961/12

AMDEL ANALYTICAL SERVICE

BATCH NO.

413

2

TT	Sample No.		Cu	Pb	Zn	Fe	From	Act To	
1	FA 14719		35	5	110	<1	130	190	volca
2	20		20	10	110	<1	190	200	"
3	1		35	55	150	<1	200	210	"
4	2		30	30	160	3	210	220	"
5	3		45	20	150	1	220	230	"
6	4		40	120	150	1	230	240	"
7	5x		30	45	430	<1	240	250	"
8	6		45	15	130	<1	250	260	"
9	7		40	15	110	<1	260	270	"
10	8		50	30	120	<1	270	280	"
11	9		30	35	150	3	280	290	"
12	10		30	160	330	1	290	300	"
13	1		45	150	210	<1	300	310	"
14	2		45	160	190	<1	310	320	"
15	3		35	95	220	<1	320	330	"
16	510 51								
17	4		55	340	380	<1	330	340	"
18	5		5	40	600	<1	340	350	"
19	14736		35	1100	480	<1	350	360	"
20	25x								

TT	Sample No.	Cu	Pb	Zn	Fe	From	To	
1	A 14731	60	5500	440	<1	360	370	sulphur volcanics
2	8	60	1000	500	<1	370	380	volcanics
3	9	5	25	460	<1	380	390	"
4	51051							
5	40	15	25	380	<1	390	400	"
6	1	60	250	280	<1	400	410	"
7	2	100	100	160	<1	410	420	"
8	3	120	15	210	<1	420	430	"
9	4	75	15	120	<1	430	440	arkose
10	5	30	15	75	<1	440	450	"
11	6	160	50	160	<1	450	460	"
12	7	4300	30	40	1	460	470	siltstone
13	8	900	160	25	1	470	480	"
14	9	900	40	25	1	480	490	pyrite
15	10	85	5	15	5	490	500	siltstone
16	11 11151	40	30	20	1	500	511 ft.	"
17	45	NO OTHER SAMPLES TAKEN				Cu Pb Zn	- Code	C
18	BLANK	—	—	—	—	Ag	Code	CV
19						All Results in PPM		
20								

High Pb - several - Highest 5500 ppm 360 to 370 feet.

High Cu 4300 ppm From 460 to 470 feet.

* DPM records give:

463 to 467	0.35% Cu
467 to 469	0.52% Cu
478 to 483.4	0.3% Cu
483.4 to 490	0.2% Cu

BORE AND WELL SPOIL SAMPLES

Obtained

By

D. KER, 1963..

WESTERN STUART SHELF AREA.

Sample No.	Grid Reference	Latitude: Longitude:	Bore Ref. No.	Name of Bore or Well	Palaeo Sample No.	Remarks
✓ 26502	J/3	28° 29' 138° 41'	23	Apatoongannie Well	F43/63	
26501				1/4 Mile SSW of Mungeranie H/S (Shale)	F44/63	Surface Spoil Sam- ple (not plotted)

WESTERN STUART SHELF AREA.

Sample No.	Grid Reference	Latitude: Longitude:	Bore Ref. No.	Name of Bore or Well	Palaeo Sample No.	Remarks
✓ 26508	E/3	28° 50' 133° 53'	2	Paragon Bore	F12/63	18S, 14N Mt. Willoughby (near Homestead)
✓ 26509	E/3	28° 57' 133° 59'	6	Watchercallem Bore	F11/63	
✓ 26510	E/4	29° 01' 133° 56'	2	Corkscrew Bore	F13/63	
✓ 26513	F/2	27° 57' 134° 27'	9	Timothy Bore	F16/63	Copper Hill Stn.
✓ 26512	F/2	28° 00' 134° 23'	8	Patricia Bore	F15/63	Appreetina South Copper Hill Stn.
✓ 26511	F/2	27° 57' 134° 16'	5	No. 2 Bore	F14/63	Copper Hill Stn. Appreetina South
✓ 26514	F/3	28° 47' 134° 19'	10	No. 5 Bore	F17/63	
✓ 26515	F/3	28° 51' 134° 22'	14	Mt Clarence H/S Deep Bore	F18/63	
✓ 26516	F/3	28° 53' 134° 37'	18	Sputnick Bore	F19/63	
✓ 26517	F/3	28° 29' 134° 11'	31	Pooramungie Bore	F20/63	
✓ 26518	F/3	28° 50' 134° 41'	40	Giddy Giddina Bore	F21/63	

WESTERN STUART SHELF AREA.

Sample No.	Grid Reference	Latitude: Longitude:	Bore Ref. No.	Name of Bore or Well	Palaeo Sample No.	Remarks
/ 26519	F/3	28° 22' 134° 11'	32	Lesley's Bore	F22/63	Murloocoppie West (Willoughby)
/ 26520	F/3	28° 56' 134° 10'	44	Craigs Bore	F23/63	
/ 26521	F/3	28° 55' 134° 15'	45	West Point Bore	F24/63A	
/ 26522	F/3	28° 55' 134° 15'	45	West Point	F24/63B	
/ 26523	F/3	28° 42' 134° 24'	58	Broken Bit Bore	F26/63	
/ 26524	F/3	28° 06' 134° 06'	47	Dead Finish Bore	F27/63	Mount Willoughby
/ 26527	F/3	28° 12' 134° 23'	52	Bridget Bore	F28/63	Evelyn Downs
/ 26506	F/3	28° 50' 134° 27'	16	Yellow Bullock Bore	F29/63	
/ 26505	F/3	28° 57' 134° 39'	29	Willow No. 3 Bore	F30/63	
/ 26504	F/3	28° 56' 134° 20'	41	Abandoned Bore H/S	F31/63	
/ 26525	F/4	29° 05' 134° 36'	129	Box Hole Bore	F53/63	14N, 14S

WESTERN STUART SHELF AREA.

Sample No.	Grid Reference	Latitude: Longitude:	Bore Ref. No.	Name of Bore or Well	Palaeo Sample No.	Remarks
26526	F/4	29° 07' 134° 29'	131	Abandoned	F51/63	
26527	F/4	29° 11' 134° 20'	12	Abandoned Bore	F52/63	Green Sand
26528	F/4	29° 11' 134° 20'	12	Abandoned Bore	F57/63	Blue Sand
26529	F/4	29° 22' 134° 24'	38	Abandoned Bore	F55/63	
26530	F/4	29° 05' 134° 20'	4	No. 2 Bore	F56/63	
26531	F/4	29° 39' 135° 00'	152	Abandoned Well	F50/63	
26532	F/4	29° 10' 134° 16'	11	Abandoned Well	F54/63	Mabel Creek
26503	F/4	29° 03' 134° 16'	3	Abandoned Bedoura Bore	F32/63	Woorong Creek
26533	F/4	29° 06' 134° 28'	130	Abandoned Bore	F49/63	Mount Clarence
26534	F/4	29° 24' 134° 46'	135	Abandoned Bore	F48/63	
26535	F/4	29° 32' 134° 55'	147	Abandoned Bore	F47/63	

WESTERN STUART SHELF AREA.

Sample No.	Grid Reference	Latitude: Longitude:	Bore Ref. No.	Name of Bore or Well	Palaeo Sample No.	Remarks
26536	F/4	29° 02' 134° 18'	180	Ping Pong Bore	F46/63	Woorong Creek
26537	F/5	30° 15' 134° 46'	93	Glynn Bore	F61/63	Bulgunnia
26538	F/5	30° 12' 134° 40'	75	Abandoned Bore	F60/63	Bulgunnia
26539	F/5	° °	94	Sextabyng Well	F59/63	Bulgunnia
26540	F/5	30° 26' 134° 58'	133	New Bore East 34 Pdk.	F58/63	Wilgena
26541	G/4	29° 52' 135° 13'	12	Dept. Works Mirikita	F69/63	13N, 13S The Twins
26542	G/4	° °	15	Barbies Bore	F71/63	The Twins
26543	G/4	29° 58' 135° 08'	18	Coronation Bore	F70/63	
26544	G/4	29° 57' 135° 55'	34	No. 6 Bore	F67/63	
26545	G/4	° °	42	Blue Duck Well	F72/63	Millers Creek
26546	G/4	29° 49' 135° 49'	26	Beetram Downs No. 1	F68/63	

WESTERN STUART SHELF AREA.

Sample No.	Grid Reference	Latitude: Longitude:	Bore REF. No.	Name of Bore or Well	Palaeo Sample No.	Remarks
26547	G/4	29° 05' 135° 42'	60	Pages Well No. 2	F73/63	
26548	G/4	29° 40' 135° 01'	7	New Year Well	F66/63	
26549	G/4	29° 58' 135° 30'	30	Beetram Downs No. 4 Bore	F65/63	
26550	G/4	29° 47' 135° 55'	32	No. 15 Bore	F64/63	Millers Creek
26551	G/4	29° 40' 135° 01'	45	Abandoned Well	F63/63	
26552	G/4	29° 01' 135° 49'	53	New Bore	F62/63	
X 26553	G/5	30° 34' 135° 53'	211	Clemens Bore	F96/63	13S
X 26554	G/5	30° 14' 135° 35'	274	Cavanaugh Bore	F90/63	
X 26555	G/5	30° 17' 135° 47'	278	Birthday Bore	F91/63	
X 26556	G/5	30° 07' 135° 33'	253	Backlands Bore (old)	F100/63	
X 26557	G/5	30° 04' 135° 34'	264	Backlands Bore (new)	F87/63	

WESTERN STUART SHELF AREA.

Sample No.	Grid Reference	Latitude: Longitude:	Bore Ref. No.	Name of Bore or Well	Palaeo Sample No.	Remarks
x/ 26558	G/5	30° 04' 135° 45'	265	Abandoned Gondalloo Bore (old)	F88/63	/
x/ 26559	G/5	30° 18' 135° 48'	279	Buckley Bore	F92/63	/
✓ 26560	G/5	30° 19' 135° 52'	61	Abandoned Bore	F94/63	/
✓ 26561	G/5	30° 07' 135° 49'	57	Paisley Well	F109/63	
✓ 26562	G/5	30° 11' 135° 44'	56	Russell Bore	F101/63	Mt. Eba
✓ 26563	G/5	30° 08' 135° 10'	40	Gondalloo Bore (new)	F93/63	
x/ 26564	G/5	30° 00' 135° 23'	257	Banjo Bore	F89/63	Nth of Mt. Eba
x/ 26565	G/5	30° 01' 135° 23'	258	Twins Stn. Bore	F108/63	
/ 26566	G/5	° °	191	Bore No. 2	F107/63	Not plotted. Near Bore 308 in G/5
x/ 26567	G/5	30° 26' 135° 50'	308	Bore No. 2	F106/63	
x/ 26568	G/5	30° 23' 135° 50'	181	Abandoned Bore Nth. Vivian Well Hut	F96/63	

Sample No.	Grid Reference	Latitude: Longitude:	Bore Ref. No.	Name of Bore or Well	Palaeo Sample No.	Remarks
26569	G/5	30° 25' 135° 50'	297	Abandoned Bore	F105/63	
26570	G/5	30° 26' 135° 50'	315	Abandoned "	F103/63	
26571	G/5	30° 25' 135° 52'	317	Deep Bore	F99/63	
26572	G/5	30° 25' 135° 50'	314	Abandoned Bore	F104/63	
26573	G/5	30° 48' 135° 48'	295	Adj. to Pyra- mid Bore	F98/63	
26574	G/5	30° 57' 135° 39'	237	Abandoned Well (McKinnons Dam)	F85/63	
26575	G/5	30° 34' 135° 44'	204	Southern Cross Well	F110/63	
26576	G/5	30° 22' 135° 10'	177	Bluff Paddock Bore	F97/63	
26577	G/5	30° 49' 135° 27'	154	Sludge	F86/63	
26578	G/5	30° 24' 135° 50'	193	Police Camp Paddock	F102/63	
26579	G/5	30° 04' 135° 19'	17	Crombies Bore	F111/63	
26580	G/5	30° 05' 135° 21'	19	Bald Hill Salt Bore	F112/63	

Sample No.	Grid Reference	Latitude: Longitude:	Bore Ref. No.	Name of Bore or Well	Palaeo Sample No.	Remarks
26581	G/5	30° 11' 135° 15'	24	Jacobs Bore	F113/63	
26582	G/5	30° 14' 135° 14'	26	Sundown "	F114/63	
26583	G/5	30° 18' 135° 15'	27	Mintabyng Bore	F115/63	
26584	G/5	30° 18' 135° 20'	28	Cheadles Bore	F116/63	
26585	G/5		37	Learie Hill Bore	F117/63	
26586	G/5	30° 14' 135° 42'	53	Central Bore	F118/63	
26587	G/5	30° 19' 135° 42'	55	Corkscrew Well	F119/63	
26588	G/5	30° 24' 135° 03'	62	No 1 Pdk Bore	F120/63	
26589	G/5	30° 25' 135° 29'	255	Dump Bore	F121/63	
26590	G/5	30° 02' 135° 25'	259	Twins H/S Bore	F122/63	
26591	G/5	30° 07' 135° 16'	261	Abandoned Bore	F123/63	

Sample No.	Grid Reference	Latitude: Longitude:	Bore Ref. No.	Name of Bore or Well	Palaeo Sample No.	Remarks
26592	G/5	30° 06' 135° 24'	262	Mathesons Bore	F124/63	
26593	G/5	30° 08' 135° 17'	263	New Saltash Bore	F125/63	
26594	G/5	30° 08' 135° 50'	269	Paisley Bore	F126/63	
26595	G/5	30° 10' 135° 32'	272	Boolka Bore	F127/63	
26596	G/5	30° 13' 135° 34'	273	Cavanagh's Bore (1)	F128/63	
26597	G/5		349	Mungillio Bore	F129/63	
26598	G/5	30° 05' 135° 36'	356	Claypan Bore	F130/63	
26599	G/5	30° 05' 135° 10'	357	Sloans Bore	F131/63	
26600	G/5	30° 10' 135° 55'	358	No. 17 Bore	F132/63	
26601	G/5	30° 11' 135° 58'	359	Abandoned Bore	F133/63	
26602	H/4	29° 25' 136° 47'	38	Coward Springs	F124/62	

Sample No.	Grid Reference	Latitude: Longitude:	Bore Ref. No.	Name of Bore or Well	Palaeo Sample No.	Remarks
✓ 26603	H/4	29° 54' 136° 16'	28	5 Mile Well	F80/63	
✓ 26604	H/4	29° 59' 136° 08'	33	No. 1 Bore	F81/63	
✓ 26606	H/4	29° 59' 136° 37'	54	Abandoned Bore (1)	F84/63	Billakalina
✗ 26607	H/5	30° 06' 136° 55'	101	Sth. of Sturt Crk. H/Stn.	F126/62	.13S
✓ 26608	H/5	30° 06' 136° 09'	3	Moodlampie Bore	F134/63	
✗ 26609	H/5	30° 02' 136° 38'	110	Abandoned Bore	F136/63	
✓ 26610	H/5	30° 00' 136° 11'	7	Night March Bore	F135/63	/
✓ 26611	H/5	30° 12' 136° 10'	107	No. 8 Bore	F137/63	✓
✓ 26612	H/5	30° 17' 136° 04'	108	No. 20 Bore Sludge	F138/63	✓
✗ 26613	H/5	30° 00' 136° 37'	109	Abandoned Bore	F139/63	Billakalina
✓ 26614	H/5	30° 08' 136° 12'	111	Woodamulla Bore	F140/63	Billakallina ✓

BORE HOLE ASSAYS WESTERN STUART SHELF AREA

INDEX NO.

			NAME OF BORE/WELL:											
Footage			Sample Type	Lithology	Formation	Cu	Pb	Zn	Ag	Mn	U			
Assay No.	From	To				ppm	ppm	ppm	ppm	ppm	ppm			
✓ 26585			Washed Paleo Sample	Calcareous Sand + limonite		5	10	25		190				
✓ 26586			"	"		5	5	10		20				
✓ 26587			"	Sand		30	10	100		220				
✓ 26588			"	feldspathic Sand + limonite		5	5	15		20				
✓ 26589			"	feldspathic Sand + lignite		25	30	400		2400	3			
✓ 26590			"	"		130	5	160		80				
✓ 26591			"	Calcareous Sand + limonite		15	5	65		30				
✓ 26592			"	Poorly sorted Sand		5	<5	5		5				
✓ 26593			"	Calcareous Sand + limonite		15	5	20		10				
✓ 26594			"	Poorly sorted Sand		<5	5	5		80				
✓ 26595			"	"		5	5	35		40				
✓ 26596			"	Calcareous		5	10	20		25				

ASSAY TECHNIQUE: AMDEL JOB NO.

2544/72

Annual Report on
Special Mining Lease No. 55

Pernatty Lagoon, Woocalla, Mt. Gunson
District of South Australia

July 1965

Geoscience Incorporated
199 Bent Street
Cambridge, Massachusetts 02141

TABLE OF CONTENTS

Abstract	1
Introduction	3
Location	4
Geology.....	5
Geologic Structure	7
Mineral Deposits	8
Past Production	9
Technical Procedures and Equipment	10
Field Procedure	11
Discussion of Results	13
Possible Production Considerations.....	14
Conclusions and Recommendations.....	17
Appendix.....	22
Bibliography.....	23

ABSTRACT

A geophysical and geochemical survey was performed in the Mt. Gunson district of South Australia. The area of the survey is to the west of Pernatty Lagoon.

The area is 90 miles from Port Augusta and lies 5-10 miles east of the transcontinental railway and the main Adelaide - Woomera road.

The mining district has been previously worked for copper and manganese. The copper and manganese minerals are associated with a sandstone and dolomite contact that follows the western edge of Pernatty Lagoon.

Past production for copper has been 3,250 tons of 8 - 10% Cu (1898-1919) and 32,400 tons of 3.5% Cu. (1941-1943). Past production for manganese has been 34,000 tons of 45 - 55% Mn. (1915-1949).

An induced polarization survey was performed over an area of 45 sq. miles and geochemical samples were taken along the induced polarization lines. At least 21 geophysical and 29 geochemical anomalies were found. At least 12 geochemical anomalies correlate with induced polarization anomalies.

Since definite anomalies in the manganese and copper areas were found, further exploration work is to be proposed.

The presence of widespread mineralization and the positive induced polarization and geochemical anomalies justify a drilling program to identify the anomalies and delineate the potential ore bodies.

A preliminary calculation from the geophysical data estimates the ore reserves in manganese north of Woorcalla as being 820,000 tons. The possibility of a

large low grade copper ore body around Mount Gunson should also be considered. An estimate of the potential in this area could be made from the drilling program. The induced polarization anomalies could be higher grade lenticular copper ore bodies. Ore reserves in this area are 395,000 tons at 3.14% copper.

INTRODUCTION

The following report describes the work and results of an exploration program carried out in the Mt. Gunson district of South Australia from February to April 1964.

The report also includes extracts from earlier publication concerning the geology and past production of the area. These reports are listed in the bibliography.

LOCATION

Special mining lease No. 55 covers an area of 500 sq. miles in the Oakden Hills pastoral run. It is about 300 miles north of Adelaide and about 90 miles north - northwest of Port Augusta. It is bounded to the east by Pernatty Lagoon and to the west by Inland ^{and about} Lagoon. Both the Transcontinental railroad and the Adelaide - Woomera road pass through the center of the lease.

The area is composed of isolated tablelands interspersed with extensive depressions occupied either by salt lakes or alluvium. On the tablelands the vegetation is very scanty with an absence of trees. In contrast the low-lying areas have a well developed covering of mallee trees, except around the margin of the salt lakes.

A few high flat-topped residual hills stand out above the general level of the tablelands. The processs of formation of the present flat land surface, as a result of widespread degradation, is well advanced.

GEOLOGY

Pernatty Lagoon is one of a number of normally dry saline lakes which occupy depressions in the region extending south from the Arcoona Plateau. The region is extensive tableland elevated some 850 ft. above sea level and constituting part of the Stuart Shelf west of Lake Torrens.

A stratigraphic cross section beginning at the surface follows:

- (1) Alluvium occurs as a covering over most of the area.
- (2) Duricrust occurs in the form of a mantle covering the tablelands. The material is composed of a tertiary secondary quartzite and is associated with angular highly silicified fragments of the underlying rocks.
- (3) Upper Sandstones - White Sandstones (100 ft. +) occur as a hard resistant capping on the residual hills. The upper 40 ft. + is a sandstone of variable grain size, not particularly well bedded, but containing hard dense quartzite layer. This formation was probably deposited under shallow water conditions. The middle 30 ft. + is a quartzite sandstone containing small cavities about one half inch in diameter. This pitting is caused by the erosion of uncemented patches of fine sand. The lower 30 ft. + is a cross bedded sandstone suggesting aeolian conditions of deposition.
- (4) Red Sandstones and grits occur under the whole area. Cross bedding is evident and shale layers are interbedded in places with the red sandstones. This rock is generally highly siliceous and in certain locales is copper bearing.

(5) Dolomitic Limestones (50-188 ft.) occur as a persistent stratigraphic horizon on the western shore of Pernatty Lagoon. The Dolomite is of great importance because all of the local manganese and copper mineralization is either distributed in it or in the sandstone beds immediately above or below it. The rock is grey in color and has a blocky, jointed appearance. It represents recrystallized carbonate rocks.

(6) Lower Sandstones (50 ft. +) - These sandstones are similar in color to the red sandstones of the upper series. At Pernatty Lagoon these sandstones are cupriferous immediately below the dolomitic limestone. Shaly layers do occur but they are by no means the predominant rock type.

(7) Rocks at depth - These rocks are of interest because they might represent the source of mineralization in the district. At nearby localities deep bores sunk for water are reported to have intersected igneous rocks. To the south and south-west the nearest porphyritic and granitic rocks outcrop in the region of Iron Knob and the Gawler ranges.

GEOLOGIC STRUCTURE

The Upper Sandstones - The Dolomitic Limestone and the Lower Sandstones form an apparently conformable series of sediments which have a subhorizontal arrangement.

The regional structural setting is one of gentle basins and dome like structures, locally fractured and faulted, but there is no definite evidence of faulting in the district.

In all probability the ore control is the limestone bed. Since copper ore occurs both above and below it, chemical precipitation is suggested as an aid to ore deposition.

MINERAL DEPOSITS

Copper

In the northern part of the district at Mount Gunson, the copper ore is found primarily in the sandstones which are in contact with the dolomitic limestones. The copper minerals associated with the sandstone are found in restricted locales, but in the dolomite traces of copper minerals can be seen over a much broader area. The copper minerals are distributed in the sandstones in an irregular fashion due to the nature of the crossbedding and the changing composition of the sandstone from a gritty texture to a quartzite.

The ore occurs as oxidised, chloride, sulphate, carbonate and siliceous minerals, as well as chalcocite. In a north-easterly direction the minerals become less oxidised. Typical grades in high grade zones are 8-15% and in average zones 3%.

The ore occurrences near Woocalla are very similar to Mt. Gunson. The mineralization is over a smaller area and is not very intense.

Manganese

Manganese is the most common mineral in the Mt. Gunson-Pernatty Lagoon district. It can be detected in the dolomitic limestone wherever this rock outcrops. In an area 5 miles north of Woocalla the manganese ore occurs in sufficient quantities to mine. Elsewhere in the district small patches of manganese ore have been located in workings. Manganese float is noticed over a wide area to the north of Woocalla.

The ore occurs as manganese oxides, chiefly pyrolusite. The grade produced ranges from 35 to 55%. The origin is likely oxidation of the dolomitic limestone caused by surface weathering. This origin is typical of most of the world's manganese deposits.

PAST PRODUCTION

The Mt. Gunson mine is in the northern part of the area. It was first worked from 1898 until 1919. The recorded production for this period was 3,250 tons and comprised dressed ore containing 8-16% Cu. During the period 1941-1943, open cut mining operations of the Zinc Corporation Ltd. produced 32,379 tons of ore averaging 3-5% Cu. Work was discontinued when the minimum grade of 2.5% Cu. could no longer be maintained by open cutting.

The manganese deposits to the north of Woocalla were in production from 1915 until 1949. During this period over 34,000 tons of manganese ore containing 45-55% Mn. was marketed. During 1942 over 8,000 tons was produced.

There are no figures for the production of the copper and manganese mines around Woocalla in the southern part of the district. It is understood to have been less than 500 tons.

TECHNICAL PROCEDURES AND EQUIPMENT

The Induced Polarization equipment used in this survey consisted of the Geoscience Incorporated IP Receiver - Model 5260 and the IP Transmitter - Model 5170 (constant-current, variable-frequency transmitter).

The variable frequency induced polarization method is basically a measurement of the resistance of the ground at two different frequencies. For example .05 and 3 cps. Small differences typically on the order of 5-20%, in the ground resistance are indicative of the presence of electronic conductors. Such conductors include metallic sulphides and graphite but exclude zones of low conductivity such as faults and salt water, where conductivity is due to ionic conductors.

FIELD PROCEDURE

After preliminary trials with different electrode configuration and receiving techniques, the dipole-dipole method was chosen as being the most suitable for the area with a frequency range of 0.3 to 3 cps. The dipole lengths used were 300 ft. and the lengths of the lines ranged from 2 1/2 to 6 miles.

In the northern section of the area where old copper workings are abundant, the traverses were run at approximately 1/2 mile intervals. In the southern section the mineralization is not as well defined. Under these conditions the most efficient use of the IP is to conduct a general reconnaissance survey. To accomplish this the traverses were run at approximately 1 1/4 mile intervals.

It was found that the speed of the survey was considerably improved by skipping a few hundred feet of traverse at every transmitter location. This technique is ideally suited in general reconnaissance prospecting for large, flat lying, low grade deposits which are observed in Pernatty Lagoon. The most likely mineral occurrence in the area is of this type.

Induced polarization measurements were made over a total of 53 1/2 miles of line. Between the Gunyah Lake copper workings and the Big Cut manganese workings, 44 miles of line were run. The remaining 9 1/2 miles are located in the vicinity of the Woocalla workings.

Geochemical soil samples were taken at 1200' intervals mainly along the IP traverses. They were analyzed for copper and the values obtained represent the unit quantities of dithizone used. A total of 290 samples were obtained over 62 1/2 miles of line.

The results of this work are presented in a series of 1" - 200' IP data plots, showing metal factor, frequency effect and resistivity, in a vertical cross section for each line. These sheets are issued separately. The interpretation for each line is listed in Discussion of Results. A tabular presentation of geochemical results is included. A 1": 1 mile base map of the area, displaying the locations of the IP and geochemical lines as well as the positions of the anomalies is also included. Further notes on the explanation of symbols used in these illustrations will be found at the end of this report.

DISCUSSION OF RESULTS

In view of the wide line spacing and general reconnaissance nature of the project, anomalies should be rated and discussed on their own individual merits, even though continuity of anomalous zones between lines can be said to exist in some places.

To facilitate discussion and to provide a ready reference to anomalies, a table of anomalies has been presented. Depth estimates depend a great deal on the resistivity of the medium surrounding the anomalous source; but generally speaking, "shallow" can be taken to mean from the surface down to 300', "medium depth", from 300' to 500', and "deep", below 500'. Ratings are given to anomalies as follows:

- A. Indicates an anomaly having a priority of interest, and may warrant further investigation as discussed in "Conclusions and Recommendations".
- B. May also warrant further investigation but considered to be of secondary importance to A.
- C. Only if further investigation of groups A and B produces encouraging results would further work in this group be feasible.
- D. A group of weak anomalies which have the lowest potential for mineralization. They can be disregarded unless further investigation of the above groups indicate the established presence of a commercially operable ore zone.

PERNATTY LAGOON

LINE	CENTER	DEPTH	F.E.	GEOCHEM.	REMARKS	RATING
33N	73E	deep	1.6	1	May result from more than one source. Eastern half may be partially invalid on account of coupling effects. Strong evidence of a relation to Gunyah workings (sulphides). Weak Geochem. (consistent with depth).	B
21N	48E	-----	---	21 9 2	High geochemical anomaly. Probably near-surface source. No I. P. information available, but moderate anomalies in adjacent lines.	A
9N	57E	shallow	2.3	45	Probably very shallow. Broad. Interesting geochemical association. Possibly related to line 21N geochemical anomaly's source.	A
	138E	deep	1.8	0.5	Deep source consistent with geochemical value. Suspect minor degree of coupling.	B
3S	24E	-----	---	2.5	Moderate geochem. No I. P. information. Isolated.	D
	108E	-----	---	3.5 2 2	Moderate geochem. anomaly. Widespread. Situated West of Gun workings. Interesting location. No. I. P. information.	C
15S	99E	deep?	1.0	0	From pole-dipole trials. Small anomaly-low interest-but may be related to Gun workings.	D
30S	75E	shallow	5.0	3	Most significant I. P. anomaly in Northern group. Near surface effect. Related to copper mined in old open cut (main one) at Mt. Gunson workings. Source probably lies in weak primary mineralization beneath carbonate copper and somewhat to the west of open cut.	A

LINE	CENTER	DEPTH	F.E.	GEOCHEM.	REMARKS	RATING
30S	105E	shallow --med. depth	2.0	0-5?	Geochemical value of 5 @ 600' west of center. I. P. anomaly associated with small open cut near Mt. Gunson homestead.	C
	135E	deep	1.0	0	Ill-defined--no geochemical associations.	D
60S	13E	med.	1.7	0	Well-defined, but weak I. P. No geochem., clean anomaly.	B
90S	135E	shallow	2.5	0	Weak I. P. Not very significant. Values perhaps could be reduced in view of slightly excessive meter drift. Manganiferous outcrop on surface.	D
120S	120E	med.	1.3	0	Weak I. P. but definite anomaly.	B
156S	171E	med.	1.9	0	Anomaly probably extends westward. Weak.	D
216S	180E	deep	1.6	1	Very weak. Slight geochemical association.	D
279S	170E	med.	4.0	no info.	Anomaly reaching moderate size, and extending westward.	C
	180E	med. - deep	3.2	no info.	Anomaly of moderated size, appears to be fairly extensive. Closely related to eastern neighbors. Manganiferous outcrops plentiful--but anomaly does not appear to be due solely to near-surface source.	B
339S	69E	deep	2.5	0.5	Weak, but interesting. Well defined.	C
	100E	shallow --med.	2.9	0-1	Approaching moderate size I. P. anomaly. May extend to east.	B
	117E	shallow	3.4	2	Moderate size I. P. May extend East and West to join adjacent anomaly. Interesting geochemical association.	B

LINE	CENTER	DEPTH	F.E.	GEOCHEM.	REMARKS	RATING
399S	12E	deep	1.9	0	Apparently isolated. Well defined. Probably worth low priority investigation.	C
	96E	shallow --med.	3.5	0	Insufficient information is available to interpret adequately. Both anomalies probably join and may result in more than one polarizable source. Scattered manganoiferous float in evidence 87E to 108E.	B
	120E	deep	5.1	0		
459S	66E	deep?	1.6	0	Weak--no geochemical value---probably extends westward.	D
	96E	deep	2.8	0	Approaching moderate size, no geochem., clean anomaly.	B
	123E	med.	3.1	0	Ill-defined, but approaching moderate size. Extends out into lake. Probably connected to above anomaly.	B
519S	18E	deep	1.7	0	Very weak, but clean anomaly.	C
	99E	med.	1.4	0	Weak, but fairly well defined.	C
	132E	shallow?	1.4	0	Ill-defined--low order of magnitude--incomplete information. Extends eastward.	D
	177E	shallow	2.9	0	Very broad anomaly. Results from wide, near surface conductor. Coupling almost certainly present in higher values associated with low resistivities. Anomaly is associated with Big Cut manganese workings. Continuation of anomaly indicated east and west.	B

WOOCALLA

LINE	CENTER	DEPTH	F.E.	GEOCHEM.	REMARKS	RATING
30N	93W	med.	1.9	0.5	Low magnitude anomaly. Weak geochemical association.	C
	75W	med.	2.4	1	Approaching moderate proportions - well defined.	B?
	18W	shallow --med.	0.9	1	Weak anomaly. Almost no polarization evident. Correlation with lines to south.	B
	21E	deep	0.8	1	Weak anomaly, and small. Almost no polarization evident.	D
	75E	shallow	2.3	1	Approaching moderate magnitude and extending eastward.	C
0	90W- 72W	med.?	2.5	3	Moderate sized I. P. anomaly--interesting association with geochemical value. Suspect slight degree of coupling. Small Mn. workings in area.	B
	60W	shallow	2.0	0.5	Approaching moderate size--but not very significant.	C
	45W	deep	0.9	3	Weak anomaly, but possesses moderate geochemical association.	C
	12W	shallow --med.	1.4	7	High geochem. value with low-magnitude I. P. anomaly. Anomaly close to sandstone-dolomite contact. Old Sweet Nell workings in vicinity.	A
	6E	?	1.3	?	Extends westward and probably related to its neighbor.	B
	30E	?	0.9	2	Incomplete anomaly with a true center probably around 24E. Moderate geochemical value.	C
	75E	?	1.3	no info.	Incomplete--extending eastward. Approaching moderate size.	C

LINE	CENTER	DEPTH	F.E.	GEOCHEM.	REMARKS	RATING
WS	6E	med. -- deep	3.8	1	Moderate anomaly situated in general area of anomalous values. Probably arises from more than one source.	A
	24E	shallow	3.3	no info.	Moderate anomaly near surface. Close to railroad.	A
	72E	shallow --med.	1.4	11	High geochem. with low order I.P. anomaly. May be related to similar anomaly on line 0. This area between the anomaly and Sweet Nell Mines worth further investigation.	A

POSSIBLE PRODUCTION CONSIDERATIONS

Copper

Estimates of tonnage for the northern area are about 395,000 tons of ore with an average grade of 3.14% Cu. These reserves were calculated for the Zinc Corporation Ltd. and can be regarded as being a fair estimate.

The major mineralization occurs in an area of about .5 sq. miles. The ore reserve of 395,000 tons by no means covers this whole area. The induced polarization and geochemical data increase the potential area to about 2-3 sq. miles. It is impossible to calculate an exact estimate of potential tonnage but it is reasonable to assume that this area could contain upwards of 20,000,000 of ore per square mile taking an average depth of 10 feet for the ore body. The ore body has been defined as the rock zone containing a grade greater than 3%. It is apparent that ore values of 1% + are contained in the surrounding rock and the potential of the area as a low grade copper deposit would be increased if these values were known. The induced polarization anomalies in this area could represent higher grade copper which is as yet unexposed.

It is possible that 200,000,000 tons of .5-1% copper exists interspersed with zones containing higher values. A continuing exploration program would determine the extent of the mineralization and the grade of the potential ore.

Manganese

The manganese deposits 6 miles north of Woocalla are about 10 feet thick and are under about 4 feet of alluvium. They form large ore bodies with ill-defined boundaries with a grade varying from 25 to 55% manganese. An average dressed sample would have the following analysis:

<u>Element</u>	<u>%</u>
Manganese	51.00
Iron	2.80
Phosphorus	.05
Sulphur	.10
Insoluble	2.50

A rough estimate of ore reserves based on the geophysical data follows.

The following values have been used in this calculation:

1 acre-foot = 43,560 cubic feet;

density of 10% Mn. ore = 3.0;

12 cubic feet of rock = 1 short ton;

from which is derived that:

1 acre-foot contains 3630 short tons of rock;

363 tons of 10% ore; containing 50% Mn.

The following assumptions are made to arrive at a conservative estimate of indicated ore:

- (1) Only shallow IP anomalies related to manganese in outcrop, float, or nearby mine are considered (5 in all).
- (2) The anomaly represents a flat-lying ore body with a square outline which has been cut parallel to one side by the traverse line.
- (3) The rock contains 10% manganese oxides averaging 50% manganese metal.

Anomaly (1)	Geoscience Rating (1)	Length Feet(1)	Probable Acres (2)	Possible Acres (3)	Tons of 50% ore per Acre-foot
90S/135E	D	790	3.8	11.9	4280
279S/180E	B	1320	6.35	40.5	14600
399S/96E	B	1630	7.8	61.0	28000
519S/177E	B	950	4.6	21.2	7640
0/90W-72W	B	1580	7.6	58.0	274000
TOTAL -					81920

(1) From the list of geophysical anomalies

(2) A width of 210 feet and length equal to anomaly length.

(3) Taking anomaly length as one side of a square deposit.

The indicated reserve of manganese metal is 82,000 short tons per foot of depth. If a working thickness of 10 feet is assumed, the indicated ore reserve is 820,000 tons having a dollar value of about \$21,000,000.*

* The London Metal price for Indian Manganese, 46-48% was about \$26.00/ton, exclusive of freight charges. (March 5th 1965)

CONCLUSIONS AND RECOMMENDATIONS

The mining district of Mt. Gunson - Pernatty Lagoon is subdivided into three separate anomalies areas. The first is the copper area in the north near Mt. Gunson. The second is the manganese area in the middle near Big Cut. The third is the copper and manganese area in the south near Woocalla.

These areas have a number of geophysical and geochemical anomalies and they are listed below.

(1) The Northern Area (lines 33N-60S) - The correlation of anomalous I. P. responses, geochemical indications, and the old copper workings is encouraging, especially in view of the accepted fact that mineralization in the region is disseminated and therefore more difficult to define. The I. P anomalies are of a magnitude consistent with low grade mineralization, and in general, we feel that this northern area has an interesting potential for a low grade copper prospect.

(2) The Middle Area (lines 339S-519S) - The I. P. results have delineated an extensive belt of weakly polarizable material that seems to lay mainly in the dolomitic limestones, close to the sandstone dolomite contact. The presence of old manganese workings, and the notable lack of geochemical copper trace in the area (with the exception of line 339S) leads us to believe that this anomaly results from a broad low grade band of mangiferous material within the dolomite. Cursory outcrop sampling in the vicinity of anomalies lends support to this view. The possibility of exploitable concentrations of manganese existing within this band should not be overlooked.

(3) Southern Area (Woocalla) - Again, there is an interesting combination of a geochemical response with anomalous I. P. values (line 0) in the vicinity of an abandoned copper prospect (Sweet Nell). Similar anomalies are observed to the south, and, as in the northern area, low grade mineralization is probably the origin of the I. P. response.

A large group of anomalies to the west displays a striking similarity from line to line, and this would indicate a degree of continuity of the source. Manganese has been worked here in the past, and an old copper mine exists some distance along strike to the south in the same geological setting.

This southern area has encouraging possibilities for the discovery of further manganese and copper deposits.

The locations of recommended subareas within each of the major areas just mentioned are presented below.

	<u>Location</u>	<u>Center of Anomaly</u>
Northern Area	33N	73E
	21N	48E
	9N	57E
		138E
	30S	75E
Southern Area	30N	75W
		18W
	0	90W-72W
		12W
		6E

	<u>Location</u>	<u>Center of Anomaly</u>
Southern Area Cont' d	WS	6E
		24E
		72E
Middle Area	339S	100E
		117E
	399S	96E-120E
	459S	96E
		123E
	519S	177E

Earlier geologic investigations of the area suggested further exploration work should be conducted. The presence of widespread mineralization which is visible over large portions of the area as float and outcrop supports this view. The fact that highgrade 10-15% copper and 35-55% manganese was mined in the past in areas where the ore was exposed near to the surface, would suggest the presence of further occurrences in locations which have not been eroded as much if favorable geophysical and geochemical results were obtained.

The geophysical and geochemical survey performed in this area, is the first logical step in a program of geologic exploration. In the Pernatty Lagoon - Mt. Gunson district, the exploration program has shown definite anomalies within three areas.

Considering the potential production of the area, based on geophysical data and geologic interpretation, the exploration program in the district should continue. A drilling program is definitely justified in two areas. They are the copper area around Mt. Gunson and the manganese area

north of Woocalla. It is suggested that these areas be investigated first, since the area around Woocalla is a secondary target in terms of an overall exploration program. It should be investigated though, when the work in the other areas nears completion. In fact if a deposit is proved in the district, it is imperative that further exploration be performed in all adjoining areas.

A drilling program would serve primarily the following purposes:

- (1) It would identify the anomalies.
- (2) It would give the grade of ore present.
- (3) It would delineate the size of the bodies and show whether the anomalies are contiguous from line to line.
- (4) It would provide valuable structural data as to the nature and the cause of the mineralization.
- (5) It would provide ore reserve figures which are essential in any future evaluation of the areas in terms of mines.

Initially, a more detailed geologic study should be made, so as to correlate the geophysical data with the geology. From this study the location of drill sites can be made. It would be most useful to study further, the geochemical samples and obtain ppm analysis for copper. It would then be possible to ascertain the surface expression of copper. This data would further assist the location of drill sites.

The ore calculation in the manganese area north of Woocalla are based on possible zones around the lines and do not represent an ore body running from line to line. If in fact these anomalies did run from line to line a very large manganese deposit would result. It would be improper to predict a potential tonnage if this was the case, but 820,000 tons of manganese as an initial figure, justifies the drilling program in this area.

The ore calculation in the Mt. Gunson copper district are based on earlier reports. An ore reserve of 395,000 tons of 3.14% copper will not make a major mine but the presence of wide spread disseminated oxidised copper and the numerous anomalies within an area of 3 sq. miles, justifies a major exploration effort in this district.

A drilling program was carried out, between Mt. Gunson and Gunyah Lake, in the past. It was designed to prove the continuity of the ore bearing horizon within the area. It supposedly eliminated the possibility of an extensive highgrade deposit. It is apparent though, from an analysis of the geochemical data, that the drilling was performed along a line having a low surface expression of copper. At Gunyah Lake the anomalous copper zone is slightly to the west and has an area of about .5 sq. miles. At Mt. Gunson the major induced polarization response and geochemical surface expression is about 5 miles to the east, within an area of about 1.5 sq. miles. It is also apparent that this program was not concerned with the low grade (1% Cu.) potential of the district.

It is proposed that another drilling program be performed with the object of ascertaining whether a large, disseminated, low grade copper deposit exists.

APPENDIX - Explanation of Symbols Used in Illustrations

Established Anomaly - This symbol represents the surface projection of a zone over which anomalous I. P. values were encountered. It is not intended to indicate the physical limits of the polarizable source. The symbol has been drawn in either on upper or lower position on the data sheet, according to whether the anomalous values occur mainly in the first (shallow source) or second (deeper source) dipole separations.

Doubtful Anomaly - The above remarks also apply, with the additional qualification that the symbol indicates values which

- (a) are due mainly to electromagnetic or capacitive coupling effects,
- or (b) may be false effects from excessive instrument drift,
- or (c) are ill-defined or weak.

An arrowhead at the end of an anomaly symbol indicates that the anomaly may have a possible extension in that direction.

Geochemical analysis number. This is a qualitative guide only to the presence of copper in a surface soil sample, and is not a direct linear measure of the amount of copper present.

The Contours - Resistivity values in Ω -meters are plotted above the line and metal factor values below. In both cases, the values from the closest dipole separation ($n=2$) are plotted nearest the line. Contour interval is logarithmic. The frequency effect is shown in parentheses below the metal factor value. This represents the percent voltage change from 3 cps. to 0.3 cps.

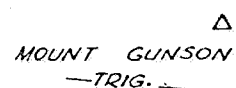
Location of sample having a copper value number greater than 1.

Line	Stations west																Stations east																
	120	168	156	144	132	120	108	96	84	72	60	48	36	24	12	0	12	24	36	48	60	72	84	96	108	120	132	144	156	168	180	192	
Pernatty																																	
33N.																	0	0	0	0	0	0	1	1	1	0	0	0	1				
21N.																	1	0.5	0	2	2	2	0.5	1	1	1	0	3	0				
9N.																	0.5	0	0	0	0	0	3	0	2	0.5		0.5	3				
3S.																	0	0	2.5	0	0	0	0.5	1	3.5	2	2	0.5	1	0.5			
15S.	0	1	0.5	0	0	0	0.5	0	1	0	1	0.5	0.5	0	0	0	0	0	0	0.5	0	0	0.5	0	0	0.5	0	2.2	2.2				
30S.				0.5	0.5	0.5	0	0.5	0	0.5	0	0.5	0	0	0	0	0	0	2	0	0	0	3	3	5	0	0	0	6	3.5			
60S.				0	0.5	0	0.5	0	0	0	0	0	0	0.5	0	0.5	0.5	0	0	0	0	1	1.5	0.5	1	1	0.5	1	1				
90S.																	0	0	2	0	0	0.5	0	0	0	0	0	0	0	0.5	1		
120S.																		0	0	0	0	0	0	0	0.5	0	0	0	0	0	0		
156S.																	0	0	0	0	0	0	0	0	0	0	0	0.5	0	0	0	0	0
216S.																	1	0	0	0	0	0	1	0.5	0	0	0	0.5	0	1	1	1	1
279S.																		0.5	0.5	1													
339S.																		0	0	0	1	0.5	0.5	0	0	1	1	1					
399S.																		0	0	0	0	0	0	0	0	0	0	0					
459S.																		0	0	0	0	0	0	0	0	0	0						
519S.																			0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
579S.																		0	0	0	0	0		0	0		0						
Woocalla																																	
30N.						0	0.5	0.5	1	1	0	0.5	1	0	1	1	0.5	1	1	1	0.5	1	0.5										
0									3	1	0.5	3	0.5	3	1		1		0.5	0.5													
WS.																	1		0	1	0.5	1											

Notes:

Values express unit quantity of dilution used in analyses. Quantities generally increase with increasing incidence of Cu in sample, but this relation is non-linear. The table serves only to point out anomalous conditions in the surveyed area. Significant values above

Pernatty Lagoon & Woocalla
TABLE of GEOCHEMICAL
VALUES



Shock : • | Bores (saline)

Günyah Lake workings

11 Ran Say - X-cu.

Gun- 35.

Gunyot

Mt. Gunson

Homestead

homestead

Legend

 Mineral deposit.

== Main road

--- Track



Delornite

 Sandstone

--- Geochemical traverses

— I.P. and Geochemical traverses

- Geochemical anomaly

1.P. anoxic zone
(predominantly 1st. dipole separation). See text.

1. P. anomalous zone
(predominantly 2nd dipole)

Baseline — follows
Oakden Hills — Pernatty fence

- 33N.

21 N.

9N.

35.

55.

jos.

05.

905.

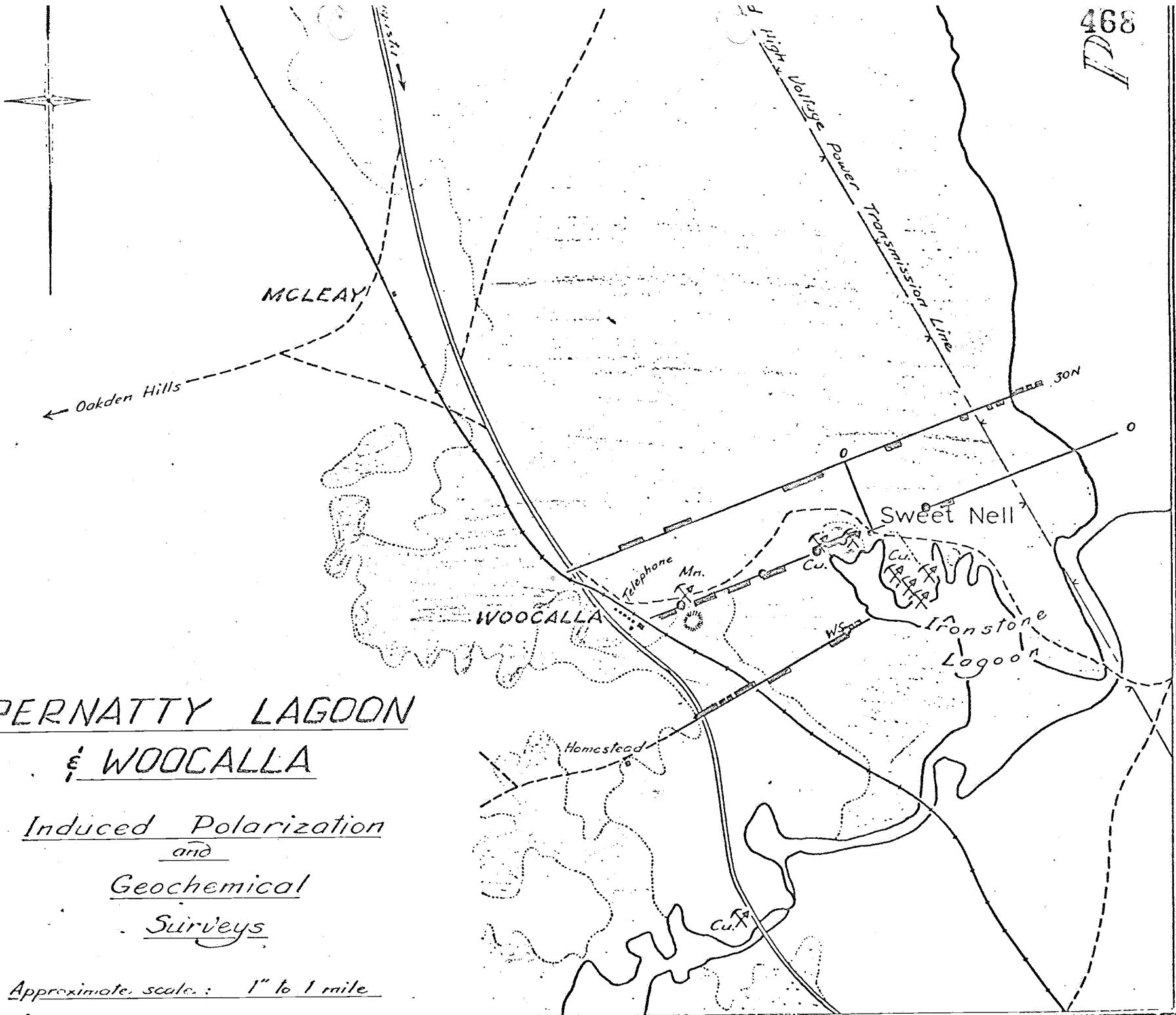
120.5

1954

5

 $\frac{1}{2}$

21006

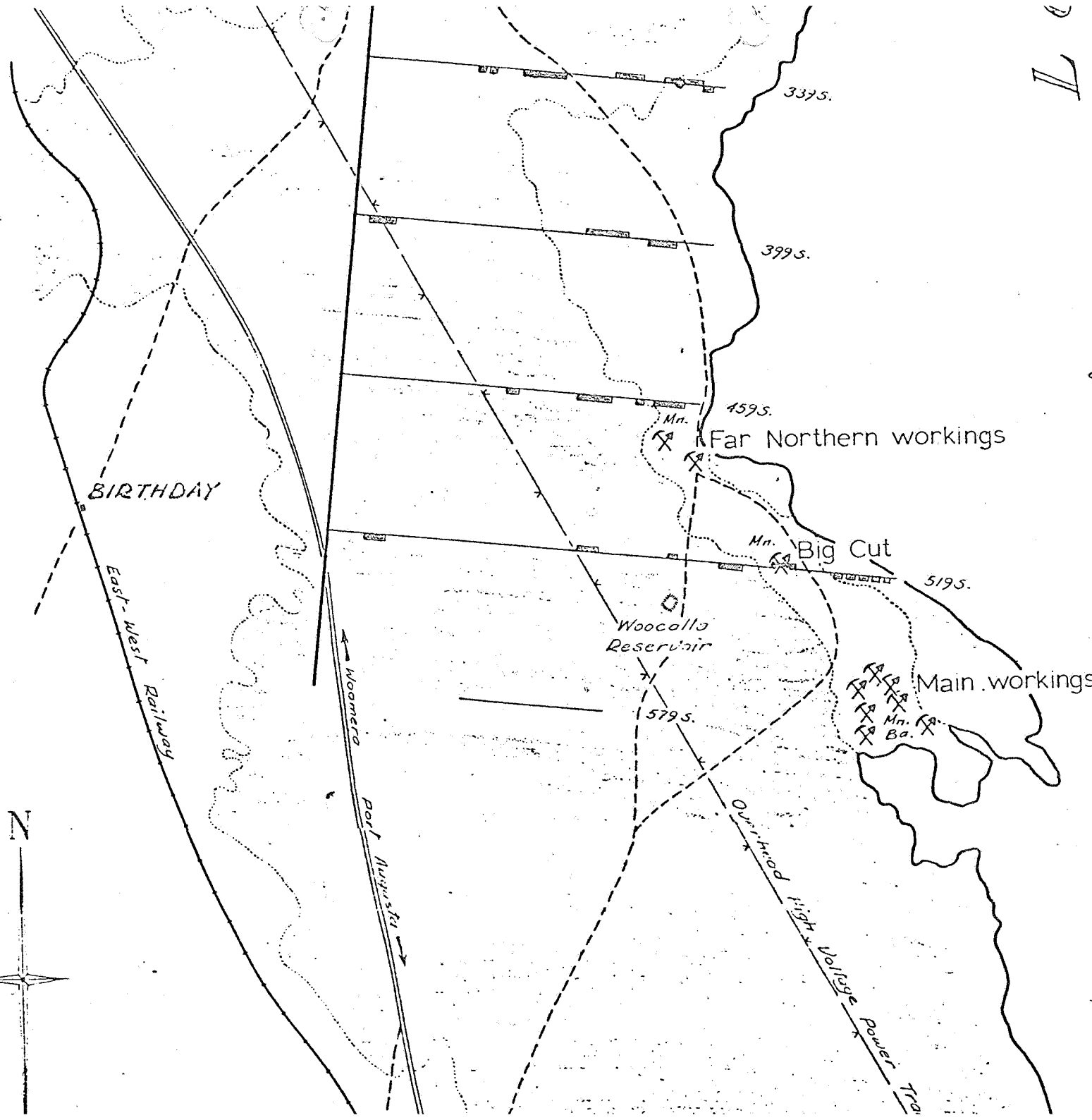
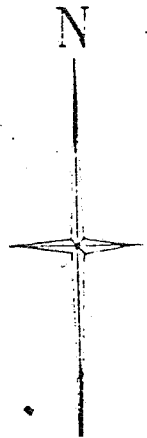


PERNATTY LAGOON
& WOOCALLA

Induced Polarization
and
Geochemical
Surveys

F.I.

Approximate scale: 1" to 1 mile



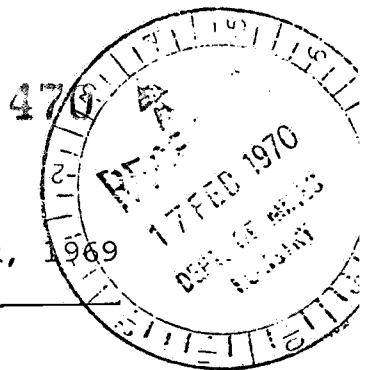
Peel at t t y

THIN SALT CRUST - DRY CLAYPAN

315
S.M.L. 135

PERNATTY LAGOON

REPORT FOR THE SIX MONTHS ENDING 15th DECEMBER, 1969



Exploration in S.M.L. 135 is directed to discovery of mineral deposits similar to those exposed in the adjacent areas of -Pernatty Lagoon. The latter deposits, which include copper, manganese, and barytes ores, are contained in sub-horizontal sandstones, shales and dolomites of the Whyalla Sandstone Woocalla Dolomite and Pandurra Formation. The regional geological data currently available on these formations indicate they are disconformable, and the disconformities are loci for mineral concentration. It is only in the narrow zone where the mineral deposits outcrop, on the west side of Pernatty Lagoon and north of Lake Dutton, that erosion has exposed all three formations. Into S.M.L. 135 the Woocalla Dolomite and Pandurra Formation pass into the subsurface and only sporadic exposures of the Whyalla Sandstone are visible in the present land surface.

It is anticipated similar conditions of stratigraphy and structure favouring the concentration of mineral deposits as are exposed at Pernatty Lagoon may be present in the shallow subsurface in areas of S.M.L. 135. Operations for the six months of the least to 15th December 1969 designed to locate such conditions have consisted of geological reconnaissance and literature surveys, a refraction seismic survey, drilling operations and geochemical assay of drill cuttings.

The geological reconnaissance and literature surveys confirmed earlier conclusions that the sand cover which blankets most of the areas of interest limits the application of surface geological and geochemical techniques. Early emphasis therefore has been placed on geophysical and drilling operations with geochemical control through analysis of drill cuttings. All these latter operations have been executed under contract

with Department of Mines equipment and personnel, overall geological supervision being provided by the Company.

A refraction seismic survey was carried out between 4th-23rd August. A Texas Instruments 7000B 24 channel recorder with attendant equipment and personnel was used to complete 35 spreads on an approximate 4 square mile grid pattern over an area of some 700 square miles. A report on the survey by Mr. I.S. Rowan, supervising geophysicist, has been submitted (reference Dept. of Mines Rpt. Bk 69/80, G.S. 4334, D.M. 806/69.)

In summary velocity sets were recorded over the subsurface which corresponded to those obtained over outcrops of the Whyalla Sandstone, Woocalla Dolomite, and Pandurra Formation. Results indicate that in a number of areas onlap-offlap conditions are present in the shallow subsurface between the formations and structural variations are superimposed on the east trending gentle regional dip. As might be expected precise correlation between outcrop and subsurface velocity sets is lacking. It is anticipated that such problems of interpretation will be resolved as subsurface data accumulates during progress of the follow-up drilling operations.

With the seismic survey results as a guideline the drilling operation was planned for drill holes to intersect the Whyalla Sandstone and Woocalla Dolomite and terminate in the top part of the Pandurra Formation, geochemical analyses to be made of the drill cuttings and the results of the geochemical work to be used as a guide to specific target areas for drilling. A caravan mounted atomic absorption spectrometer was provided in field for the analysis of drill cuttings. Problems associated with the drilling equipment have retarded progress on this operation. The initial rig allocated to the programme drilled five holes for a total footage of 357', between 26th - 28th August, the drill did not penetrate to the desired objective and was replaced with a Failing W.W.I. rig with a larger compressor and capacity to hammer drill the hard

Page 3.

sandstones encountered. The Failing W.W.I. commenced drilling on 19th November and had drilled 11 holes for a total footage of 1,246 feet by 27th November. On the latter date a cylinder in the compressor collapsed necessitating major workshop repairs. It was decided therefore to suspend operations during mid-summer and recommence drilling in 1970 when cooler weather conditions prevailed. Details of the drill holes and geochemical analyses on operations completed to date are held by the Geological Survey and Drilling Branch. Interpretations of the results are to be incorporated in the report compiled when the drilling operation is completed.

Bore 7.

- 0- 98 feet Red and yellow clayey sand.
- 98-303 feet Cream sand, mostly fine.
- 303-323 feet Yellow and pink fine sand.
- 323-390 feet Fine cream sand.
- 390-408 feet Pink medium sand.
- 408-435 feet Cream and yellow medium sand.
- 435-520 feet Fine pink sand.
- 520-527 feet Pink sand and ironstone-laterite.
- 527-540 feet Dark grey black pyritic and carbonaceous sand.
- 540-567 feet Fine, dark grey carbonaceous silty sand with fine, angular to subangular quartz grains, pyrite, biotite.
- 567-595 feet Grey-white kaolinized sandstone and clay (?Permian).
- 595-740 feet Green pyritic siltstone interbedded with sandstone and conglomerate.
- 740-1721 ft. Chocolate and brown siltstone and shale.
- Below 959 feet the formation belongs to the Marazion Series.
- 1721-1724'6" Diorite, believed to be basement.

Bore 14.

- 0- 68 feet Red brown sand and clayey sand.
- 68-202 feet Chocolate and blue-grey siltstones and shales and brown sandstones (Upper Proterozoic).

Bore 15.

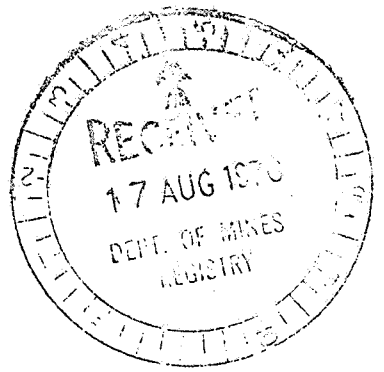
- 0-114 feet Dark red sands and clayey sand.
- 114-126 feet Yellowish-brown sticky gritty clay with quartz grains black carbonaceous and pyritic aggregates, shale fragments. The age is uncertain, but the black aggregates may represent weathering or reworking of the Eocene paralic clays.
- 126-402 feet Greenish grey and chocolate siltstones and sandstones (Upper Proterozoic).

Bore 16.

- 0- 78 feet Red and yellow terrestrial sands.
- 78- 87 feet Yellow-brown clay of uncertain age.
- 87-227 feet Blue and chocolate siltstones and sandstones.

Bore 17.

- 0- 80 feet Red brown clayey sand and kunkar.
- 80-103 feet White sandstone - age undetermined.
- 103-220 feet Red brown and white siltstone, chocolate, brown and green shale and dolomite.



SPECIAL MINING LEASE 315 - STUART'S BLUFF MINERALS LTD.

PERNATTY LAGOON, SOUTH AUSTRALIA

REPORT ON EXPLORATION - 30TH APRIL, 1970.

CONTENTS

INTRODUCTION	1
LOCATION DATA	1
MINERAL DEPOSITS	2
GEOLOGICAL DATA	2 - 3
GEOLOGY OF THE PERNATTY LAGOON ORE DEPOSITS	4
PREVIOUS EXPLORATION IN SML 315	4
THE EXPLORATION PROGRAMME IN SML 315	4 - 6
CONCLUSIONS AND RECOMMENDATIONS	6
ACKNOWLEDGEMENT	7
ILLUSTRATIONS:	
Figure 1	Locality Map - SML 315
Figure 2	Tectonic Map of Region Surrounding SML 315
Figure 3	Geological Map of SML 315 and Environs (in folder)
Figure 4	Velocity Isopachs Sets 1, 2 and 3
Figure 5	Isopach Map - Velocity Set 3
Figure 6	Bore Location Map
Table 1	Proterozoic Stratigraphy
Table 2	Summary of Seismic Results
Appendix	Geochemical Results of Drilling Programme

INTRODUCTION:

476

Special Mining Lease 315 was issued to Stuart's Bluff Minerals Ltd. for a term of one year on 16th June, 1969. Lease conditions require the Company to undertake geophysical, geochemical and drilling operations at minimum expenditure levels of \$10,000 in the first six months and \$15,000 in the second six months. The Company has completed its work obligations and exceeded the minimum expenditure requirements for the first six months to December 1969. It is to complete a combined shallow drilling and geochemical operation by 16th June, 1970, to have fulfilled its work obligations for the second six months.

Operations during 1969 consisted of a seismic survey and a combined drilling and geochemical operation, carried out under contract by units of the South Australian Department of Mines and, in conjunction with this work, a geological reconnaissance and literature study by the Company's geologist. The seismic survey, geological reconnaissance and literature study are completed. The combined drilling and geochemical operation, initiated in the last quarter of 1969 was suspended on 27th November following drilling equipment breakdowns, with the intention of resuming the work in 1970. The programme consists of drilling approximately 50 holes to an average depth of 100' with the drill cuttings being geochemically analysed with a field mounted atomic absorption spectrometer.

This report covers the objectives and results of exploration by the Company in the lease area to 30th April, 1970.

LOCATION DATA:

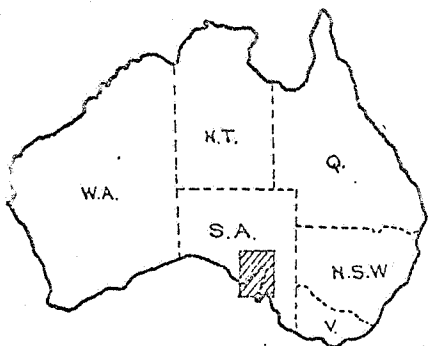
SML 315 covers 840 square miles of South Australia between Port Augusta and Woomera; with Lake Torrens lying east of its eastern boundary and its western boundary passing through the eastern side of Pernatty Lagoon.

The dissected plateau of the Andamooka Range, 600' - 800' above sea level with its surface pitching south to north at a low angle, bounds the east, north and north-west sides and extends into the north-east corner of SML 315. Below the plateau to the south and west lies a sand covered plain, 200' - 300' above sea level in the lease area, falling gradually south-east to sea level around Port Augusta. Salt pans, dry or forming shallow ponds of saline water, and sand dunes are common land forms of the plain. Poorly exposed sandstones form minor undulations to low hills rarely rising to 50' above the level of the plain.

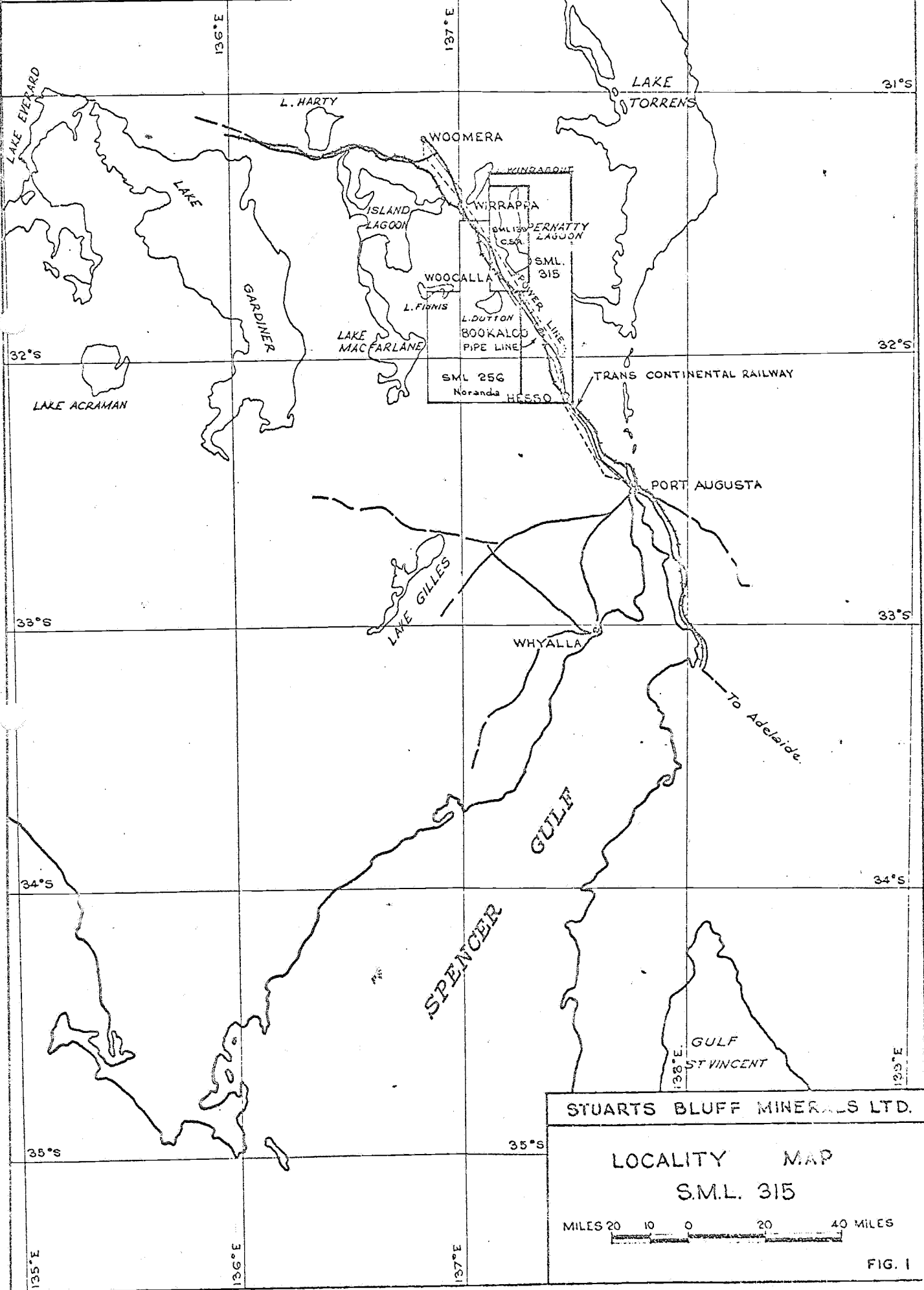
Climate of the region is semi-arid. Rainfall is low and unreliable, the average annual over the last twenty years approximating 7 inches. Evaporation rate is high. Summer temperatures frequently exceed 100°F, average maximum approximately 90°F, with the average winter minimum approximately 45°F. Saltbush and bluebush shrubs, the stunted Mulga and Myall trees and localised developments of She-oak are the dominant vegetation.

Grazing of sheep and cattle constitutes the principal industry of the region. Copper, manganese and barytes ores, located along the west side of Pernatty Lagoon, have been spasmodically mined in the past and small tonnages of ceramic clay have been quarried at Woocalla. Mining of the copper ores is currently being rejuvenated.

The Stuart Highway and the Transcontinental Railway, linking Adelaide and Perth, pass diagonally through the southern half of SML 315, approximate distances by these routes from Port Augusta being 30 miles to the southern and 60 miles to the western boundaries of the lease. An 8 inch water pipeline and a high tension power transmission line, connecting Woomera and Port Augusta, run parallel and adjacent to the road and rail systems. An all weather road runs northward through the lease area from Bookaloo to Pernatty and Yeltacowie Homesteads. Numerous tracks traverse the lease area.



LOCALITY PLAN



Copper with associated silver, manganese and barytes deposits are partly exposed along the west side of Pernatty Lagoon where they occur as tabular, almost horizontal bodies in sandstones, dolomites and shales of Pre-Cambrian age (figure 3).

The copper minerals (including malachite, chalcocite, covellite, bornite and atacamite) occupy interstices in the porous sandstones, cracks in the dolomite and impregnate the black shales associated with the dolomite. Thickness and grade of the ores vary, most are low grade, with worked thickness up to 14 feet in the sandstone sections and 8-15% typifying high grade zones.

The manganese ore results from enrichment of manganiferous dolomite. The ore is uniformly distributed over appreciable areas of dolomite and also occurs as irregular pockets along joint planes. The abandoned workings were about 14 feet deep over an area of approximately an acre. Crude ore produced contained 35-57% manganese.

The barytes is closely associated with the manganese deposits and occurs as massive, coarsely crystalline aggregates. The main exposure, the vertical dimensions of which have not been tested, occupies a rise slightly above lagoon level, approximately 150 feet wide and 1500 feet long. A fairly pure grade ore was derived from the now abandoned workings.

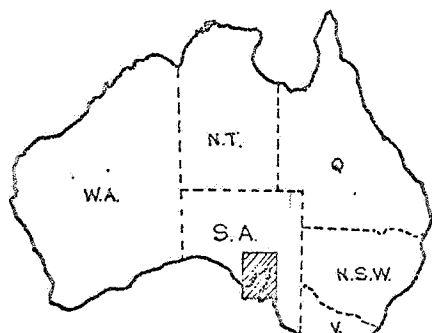
Since discovery of the deposits mining has been spasmodic and production limited. Between 1898-1937 recorded output of copper ore amounted to 3,250 tons, mainly dressed ore containing 8-16% copper. Between 1941-1943 32,380 tons of copper ore, averaging 3.5% copper, were mined for a yield of 1,084 tons copper and 14,523 ozs. silver. In the last two years C.S.R. Co. Ltd. and associates have been preparing sections of the northern copper deposits for open-cut mining. Milling, crushing and flotation equipment is being erected and initial production of concentrates is planned for 1970. Current estimate of ore blocked out for open-cut mining and treatment is 3,200,000 tons containing about 23 lbs. copper and 0.35 ozs. silver per ton. Planned average annual production of concentrates over a ten year period, expressed in terms of copper metal equivalent, is 2500 tons, plus associated silver.

Recorded production of manganese ore, from 1915 to 1949 when mining ceased, amounted to 34,000 tons containing 40-55% manganese. Production of barytes, over the period 1917-1939, is recorded as 1584 tons.

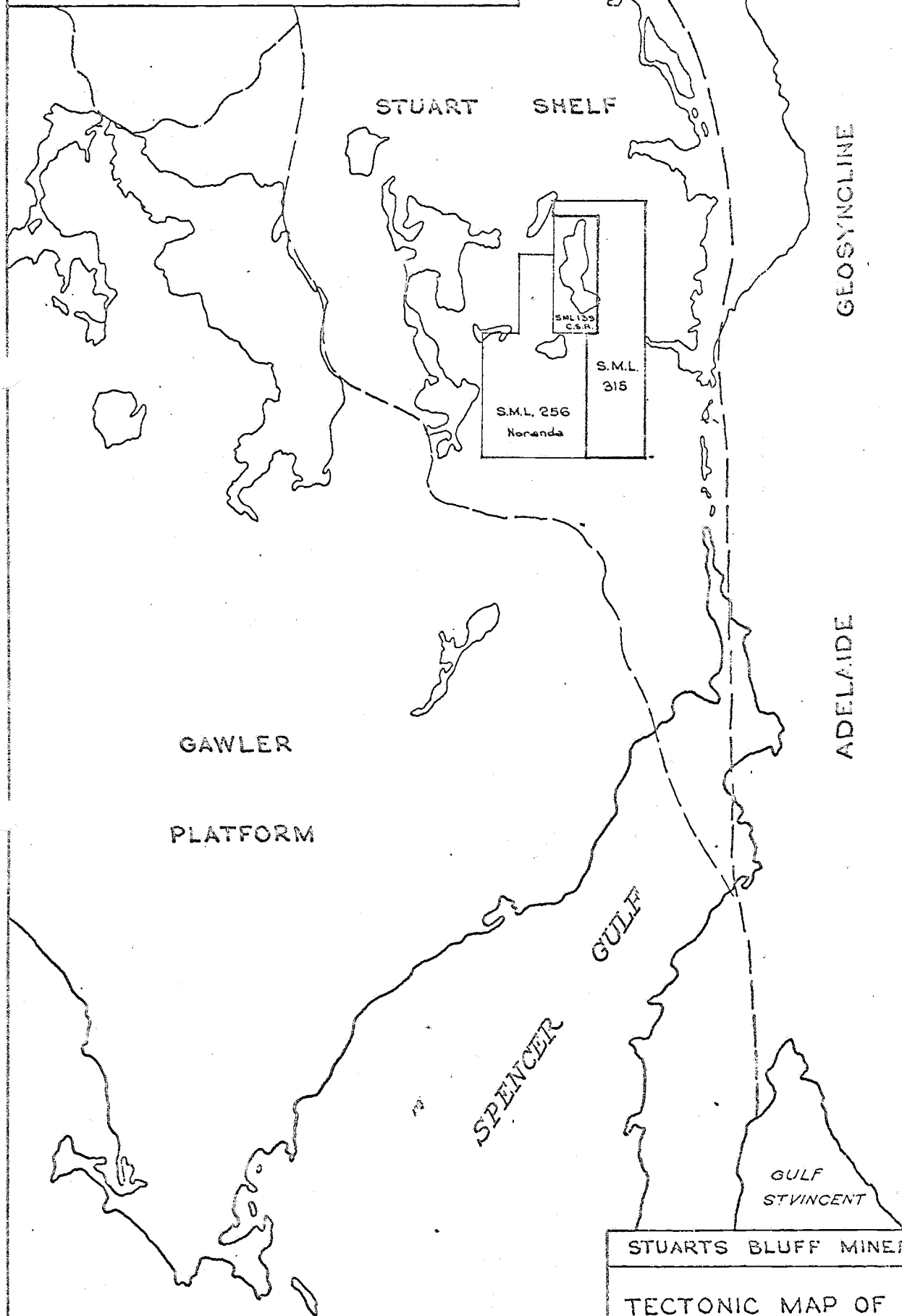
In reference to ore reserves the current estimate of 3,200,000 tons for the ore blocked out by C.S.R. and associates considerably upgrades proven copper reserves over past estimates. Unfortunately elsewhere little development prospecting appears to have been undertaken. The annual report on SML 55, July 1965, records potential reserves, based on geophysical and geochemical surveys, of 820,000 tons manganese for the main manganese deposits, and 200,000,000 tons of 0.5-1% copper for the northern copper deposits. It is not known to what extent exploratory drilling has been carried out to prove or disprove these estimates.

GEOLOGICAL DATA:

The deposition of the Pernatty Lagoon orebodies is a function of the stratigraphy and structure of the Pre-Cambrian sediments in which the orebodies occur. It follows that mineral exploration in adjacent areas requires a detailed knowledge of the stratigraphy and structure of these sediments. Before examining this aspect of exploration in SML 315 in detail, it is pertinent to review briefly the regional setting of the Pre-Cambrian sediments.



LOCALITY PLAN



STUARTS BLUFF MINERALS LTD.

TECTONIC MAP OF REGION
SURROUNDING S.M.L. 315

MILES 20 10 0 20 40 MILES

FIG. 2

STUART SHELF

Adelaide System:

Tent Hill Formation (Marinoan)
 Simmens Quartzite
 Corraberra Sandstone
 Tregalona Shale
 Whyalla Sandstone
 - - disconformity -

Woocalla Dolomite (Torrensian?)
 - disconformity -

Pandurra Formation (Torrensian?)
 - unconformity -

Roopena Volcanics (Willouran)

ADELAIDE GEOSYNCLINE

Adelaide System:

Wilpena Group (Marinoan)
 Umberatana Group (Marinoan-Sturtians)
 Burra Group (Torrensian)
 Callana Beds (Willouran)
 - unconformity -
 Callan Beds (Willouran)

including Roopena Volcanic Equivalents

- unconformity -

GAWLER PLATFORM

Carpentarian and Undifferentiated Lower Proterozoic rocks - folded metasediments and volcanics with extensive igneous intrusions.

Figure 2 depicts the geographic distribution of the three main tectonic units of the region, the Gawler Platform, Stuart Shelf and Adelaide Geosyncline, all composed of Pre-Cambrian (Proterozoic) rocks. The stratigraphic relationship of these rocks are shown in Table 1. Their outcrop distribution is illustrated in figure 3.

The Adelaide Geosyncline and Stuart Shelf are both composed of Upper Proterozoic rocks of the Adelaide System entirely sedimentary except for a basic volcanic sequence at the base. The two tectonic units are separated by a downwarped zone passing through Lake Torrens, Spencer Gulf and Gulf St. Vincent. The thick folded sequence of the Adelaide Geosyncline on passing westwards through the downwarped zone, gives way on the Stuart Shelf to a relatively thin, subhorizontal sequence of sandstone, shale and dolomite unconformably underlain by a basic volcanic sequence (Roopera Volcanics). To the south west the Gawler Platform forms a basement complex of intruded metasediments and volcanics on which the Stuart Shelf sequence rests with marked unconformity.

THE STUART SHELF:

The Pernatty Lagoon ore deposits and the adjacent area of SML 315 lie within this tectonic unit. The basal unit, the Roopera Volcanics, outcrops in one locality only, 25 miles south west of Port Augusta where it unconformably overlies the Gawler Platform complex and is unconformably by the Pandurra Formation. The remainder of the Stuart Shelf sequence is entirely composed of sediments, sub-horizontal, with dips of the order of 1° to 5° . The shallow regional dip of these sediments is to the north-east away from the Gawler Platform. The following is a brief description of the sequence in descending order:-

Tent Hill Formation - 4 conformable members:

Simmens Quartzite	white quartzite with shale casts.
Corraberra Sandstone	red-brown, flaggy micaceous sandstone.
Tregalona Shale	purple and brown siltstones and shale.
Whyalla Sandstone	white sandstone, conglomeratic at base.

Woocalla Dolomite - black manganiferous dolomite and black shale.

Pandurra Formation - red sandstone and conglomerate.

The three topmost members of the Tent Hill Formation have been eroded off much of southern area of the Stuart Shelf, their remnants forming the plateau of the Andamooka Range in the north and east, and the mesas west of Port Augusta and Spencer Gulf. The base of the escarpments of the plateau and mesas lies near the boundary between Tregalona Shale and Whyalla Sandstone.

South and west of the escarpment is the sand covered plain in which Whyalla Sandstone, Woocalla Dolomite and Pandurra Formation are poorly exposed. It is with these beds that the Pernatty Lagoon ore deposits are associated. The following is a reconstruction of the depositional history of these sediments:-

1. A shallow marine transgression across the Stuart Shelf accompanied by rapid deposition of the coarse-grained, cross-bedded sandstones and conglomerates of the Pandurra Formation.
2. Quiet deposition of the Woocalla Dolomite in shallow waters. The close association of manganese, iron and barium (and possibly copper) salts with dolomites and black shales suggests deposition in a partially closed basin or basins. The rims of the basin (or basins) consisted of Pandurra Formation sandstones as topographically high areas.
3. A further marine transgression accompanied by deposition of the basal conglomerate and the succeeding coarse-grained, cross-bedded sandstones of the Whyalla Sandstone. The latter completely covered the Woocalla Dolomite and transgressed onto the eroded surface of the Pandurra Formation.

The Pandurra Formation forms a prominent topographic high along the west side of Pernatty Lagoon. On the east slope of this high, the Whyalla Sandstone rests on the eroded surface of the Pandurra Formation. Further down slope, near the edge of the Lagoon, the Woocalla Dolomite separates the two sandstone units, the Pandurra Formation passing beneath the Woocalla Dolomite under the Lagoon, the Whyalla Sandstone lying above the Woocalla Dolomite.

In the northern copper deposits the copper ores are concentrated in the basal porous sandstone of Whyalla Sandstone, both in the lower slope where the sandstone rests on Woocalla Dolomite and on the upper slope where the sandstone lies on the eroded surface of the Pandura Formation. Minor concentrations of ore also occur in joints in the eroded dolomite near the Lagoon edge. Significantly ore concentrations do not appear in the Pandurra Formation.

In the southern copper workings the ore occurs as impregnations in black shale underlying the dolomite. Both dolomite and shale appear to pinch out against the sloping surface of the Pandurra Formation. No Whyalla Sandstone is present.

Similar thinning of the dolomite occurs in the vicinity of the manganese and barytes deposits. The manganese ores are concentrated by decomposition of manganiferous dolomite. The closely associated barytes is probably derived from the dolomite by a similar process of leaching and concentration.

The pinch out of the Woocalla Dolomite against the sloping surface of the Pandurra Formation probably represents an ancient Woocalla shoreline. Where Whyalla Sandstone transgresses both Woocalla Dolomite and Pandurra Formation, its basal porous sandstone apparently provides a conduit for the passage of copper bearing solutions and precipitation of copper ores from these solutions.

The conditions of stratigraphy and structure favouring deposition of copper, manganese and barytes ores in the exposed areas of Pernatty Lagoon might reasonably be expected to occur in the subsurface elsewhere in the region. The search for such deposits is the exploration objective in SML 315.

PREVIOUS EXPLORATION IN SML 315 AREA:

Aeromagnetic surveys, which included the area of SML 315, were flown in 1962 by the Bureau of Mineral Resources on behalf of the S.A. Mines Department. The results were subsequently interpreted by Austral Exploration Services on behalf of Noranda Aust. Pty. Ltd. A number of anomalies were defined in SML 315 but were of too great depth to be considered significant targets in the current exploration programme.

Geological and geochemical surveys were conducted over a 2700 square mile area (including the area of SML 315) in 1968 by D. Tonkin for Noranda. The main value of these surveys was the determination of the outcrop distribution of the Pandurra Formation and Whyalla sandstone and the establishment of the disconformity between these formations and the Woocalla Dolomite. Surface geochemical surveys are of little value in SML 315, much of the area is blanketed by sand and outcrops are poor. However the background values obtained over the whole region of study, for the Pandurra Formation, Woocalla Dolomite, and Whyalla Sandstone could prove useful in evaluating subsurface geochemical results.

THE EXPLORATION PROGRAMME IN SML 315:

The exploration objective in SML 315 is the discovery of ore deposits at shallow depth similar to those exposed on the west side of Pernatty Lagoon. As has been shown the determination of the stratigraphic and structural relationships of the Pandurra Formation, Woocalla Dolomite and Whyalla ^{SANDSTONE} in the area is an essential part of the exploration programme. The area is blanketed for the most part by recent sands and outcrops are limited. The exploration of the area from the outset therefore involves subsurface investigations by drilling or geophysical methods.

The exploration programme designed to cover the first year of operations is divided into two phases:

1. A refraction seismic survey to provide stratigraphic and structural data on the Whyalla Sandstone, Woocalla Dolomite and Pandurra Formation as a guide to phase 2.
2. A combined operation of shallow drilling and geochemical assay of drill cuttings as a guide to detailed drilling over selected localities.

Arrangements were made with the South Australian Department of Mines to undertake both phases of the programme with Departmental equipment and crews.

REFRACTION SEISMIC SURVEY:

The survey was initiated on 4th August and completed on 23rd August. A Texas Instruments 7000B 24 channel recorder with attendant equipment and crew was used to shoot 35 spreads on an approximate 4 square mile grid over an area of some 700 square miles. Experimental spreads shot over outcrop of Whyalla Sandstone, Woocalla Dolomite and Pandurra Formation yielded the following velocity data:

Whyalla Sandstone	5,000 - 7,000 f.p.s.
Woocalla Dolomite	8,500 - 12,000 f.p.s.
Pandurra Formation	12,500 - 16,000 f.p.s.

The exploration spreads yielded four velocity sets:

Set	
1	1,000 - 5,000 f.p.s.
2	5,000 - 9,000 f.p.s.
3	9,000 - 12,500 f.p.s.
4	12,500 - 16,000 f.p.s.

Isopach values, calculated for each of the four sets are given in Table 2 and figure 4.

Some divergence must be expected between the interpreted velocity and actual formation characteristics. However, if the derived velocity isopachs equate in general to Pandurra Formation, Woocalla Dolomite, Whyalla Sandstone and Cainozoic sediments respectively, then large areas exist where the same conditions of stratigraphy and structure are present as in the areas of known ore deposition at Pernatty Lagoon.

The absence of set 3 values in a number of areas suggests pinch-out of the Woocalla Dolomite. The isopach distribution illustrating this point is presented in figure 5. Onlap of Whyalla Sandstone onto Pandurra Formation is suggested by a comparison of isopach values shown on figure 4.

THE DRILLING PROGRAMME:

This operation has been hampered by mechanical problems associated with the drilling equipment. Insufficient air compression, leading to failure to remove drill cuttings and maintain penetration, resulted in frequent abandonment of drilling without fulfilling the desired objective. The collapse of a compressor piston, necessitating major workshop repairs, caused suspension of the operation on 27th November. The locations of the 16 holes spudded to date are shown on figure 6. The geochemical results are tabulated in the appendix.

The proposal for completion of this programme envisages 5,000' of drilling as the preliminary target, the drill holes averaging 100' in depth and penetrating Whyalla Sandstone and Woocalla Dolomite into the top of Pandurra Formation, with sampling of drill cuttings at five intervals and geochemical analysis with a field mounted atomic absorption spectrometer.

CONCLUSIONS AND RECOMMENDATIONS:

1. The stratigraphic and structural relationships of the Pernatty Lagoon ore deposits to the Pre-Cambrian sediments in which they occur favours sedimentary control of ore deposition.
2. Results of a refraction seismic survey undertaken in SML 315 justify the implementation of phase 2 of the first year operations involving 5,000' of shallow drilling and geochemical assay of drill cuttings. This latter operation has been suspended in its early stages following a major breakdown in drilling equipment.

It is recommended that the remainder of the drilling operation to be undertaken be concentrated in the area between Bookaloo and the southern end of Pernatty Lagoon.

D. ROSE.

TABLE 2 - SUMMARY OF SEISMIC RESULTS

485

Spread	Thickness		Set III	Depth to Set IV	Remarks
	Set I	Set II			
1	10	-	-	10	Pandurra o/c
2	15	-	100	115	Woocalla o/c
3	9	75	-	84	Whyalla o/c
4	10	-	45	55	Woocalla o/c
5	10	90	na	-	Whyalla o/c
6	32	33	-	65	
7	78	43	-	120	
8	120	110	-	230	
9	30	57	67	154	Bore 207
10	8	58	-	66	
11	20	167	-	187	
12	73	39	128	240	
13	21	-	78	99	
14	43	-	60	103	
15	20	81	-	101	
16	19	-	-	19	
17	22	100	162	284	
18	15	150	na	-	
19	22	41	134	197	
20	16	114	118	248	
21	24	-	-	24	
22	15	140	-	155	
23	17	106	120	243	Depth Probe
24	47	78	137	262	
25	26	-	-	26	
26	21	38	-	59	
27	23	64	102	189	
28	21	-	90	111	
29	19	45	-	64	
30	21	83	193	297	
31	19	28	67	114	
32	21	55	85	161	
33	19	93	-	112	
34	16	55	109	180	
35	20	24	200	244	Depth Probe Beda Bore

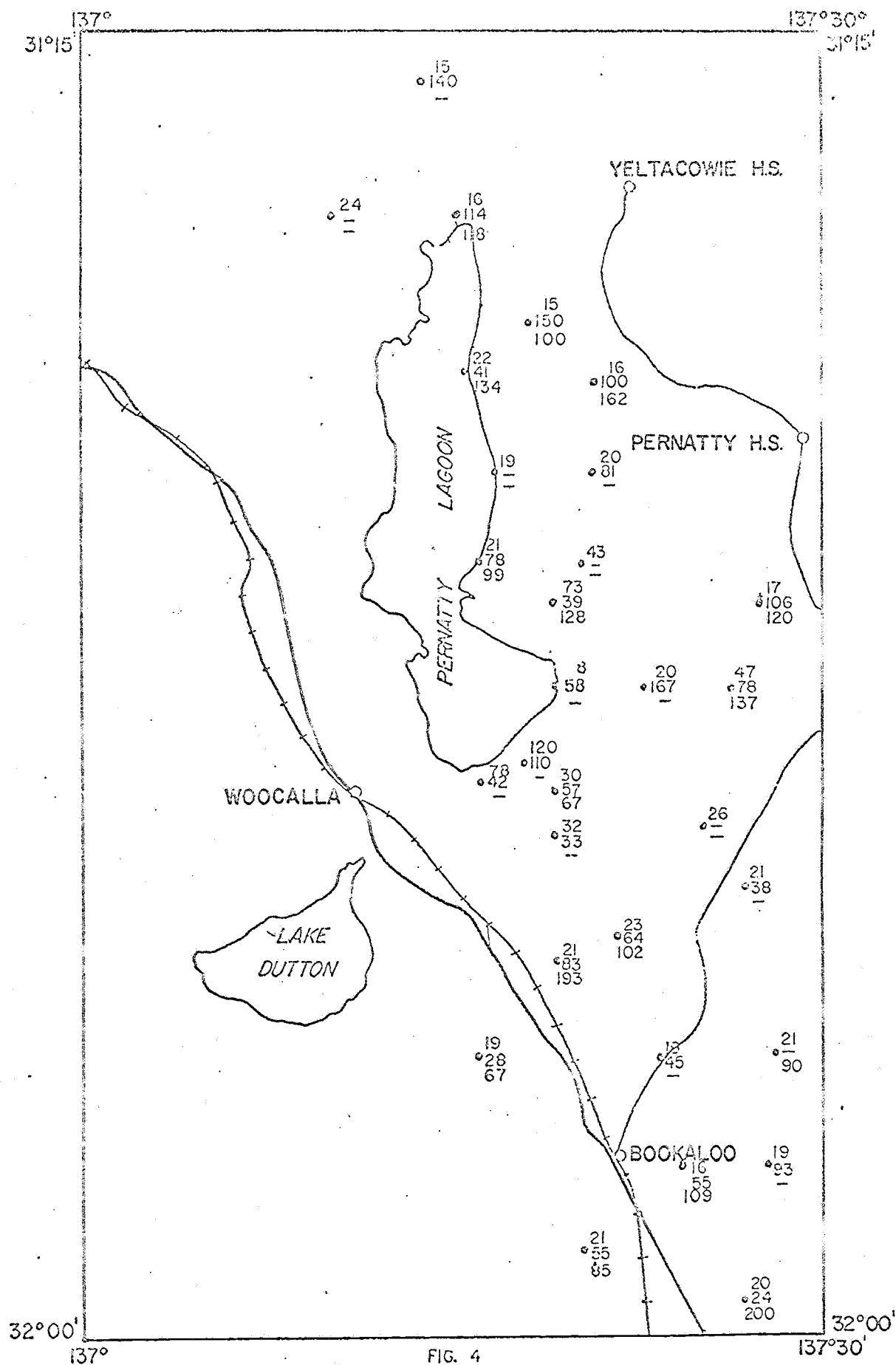


FIG. 4

STUARTS BLUFF MINERALS LTD

Seismic Survey SML 315

Velocity Isopachs Sets 1, 2 and 3

SCALE 1" = 6 miles

- 21 (Velocity Set 1)
- 38 (Velocity Set 2)
- (Velocity Set 3)

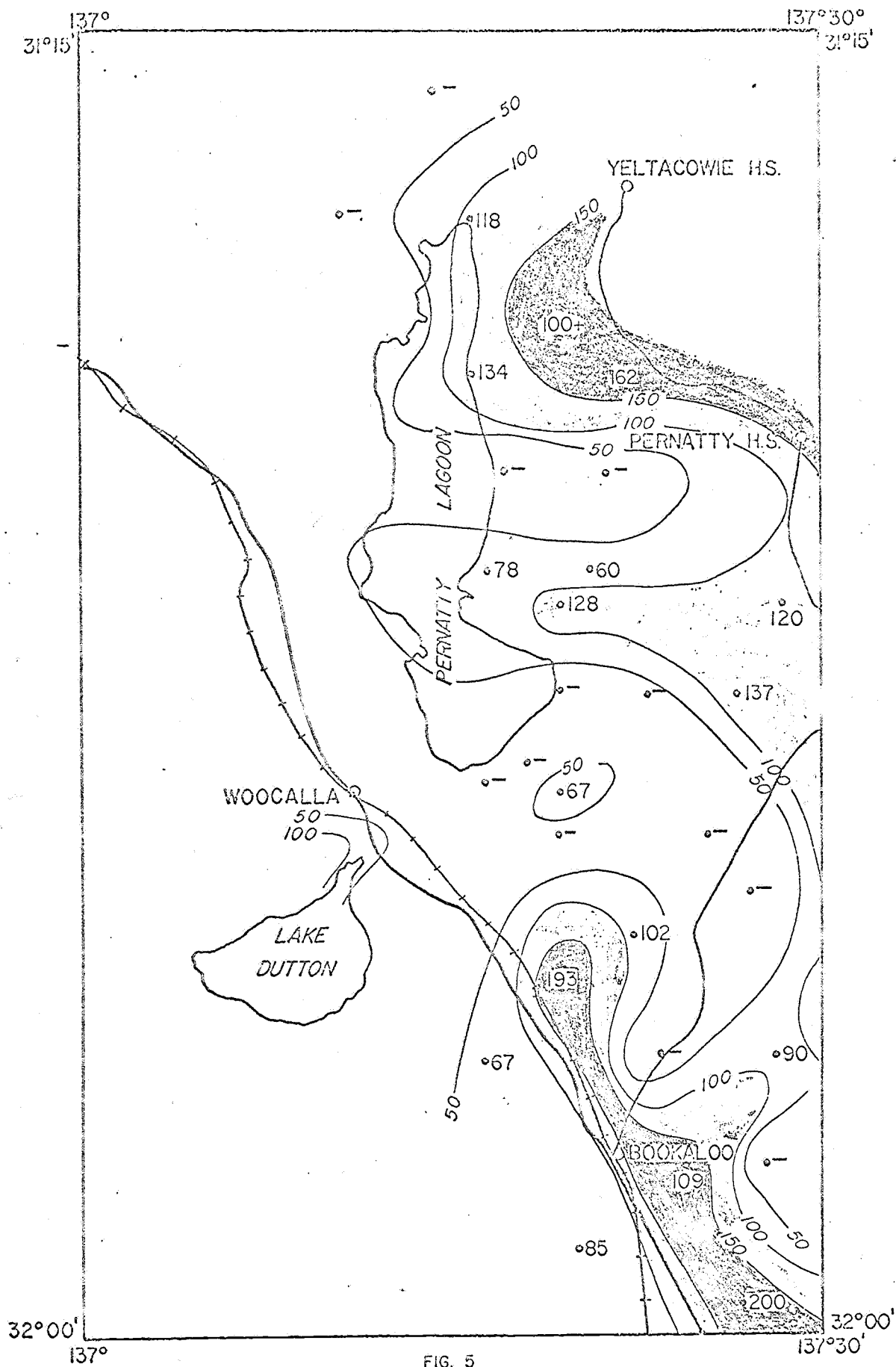


FIG. 5

STUARTS BLUFF MINERALS LTD

Seismic Survey—SML 315

Isopach Map—Velocity Set Three

(Woocalla Dolomite Equivalent)

SCALE 1" = 6 miles

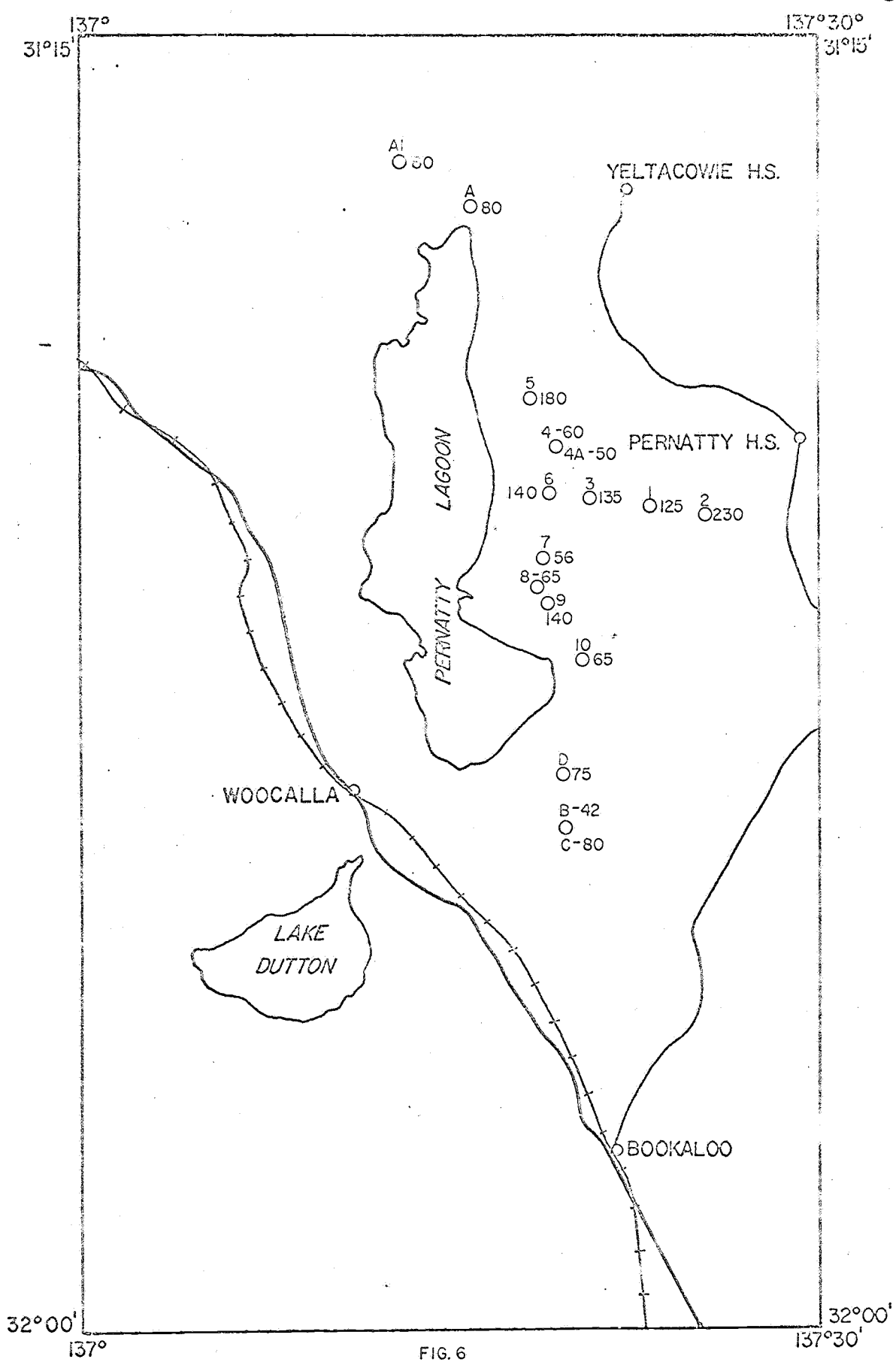


FIG. 6

STUARTS BLUFF MINERALS LTD

Drilling Programme

Bore Location Map

SCALE 1" = 6 miles

Virtually all data used in the literature study of this area has been derived from sources within the S.A. Department of Mines. The help of the Department staff and their willing participation in discussion throughout the work is gratefully acknowledged.

APPENDIX

GEOCHEMICAL RESULTS OF DRILLING PROGRAMME

PERUVATTY LAGOON

491

CORE SAMPLES - 30#

A.A.S. AQUA-REGIA HOT LEACH

BATCH NO. 1
HOLE NO. 881/58

M.W.

T.T.	SAMPLE NUMBER	Cu	Pb	Zn	REMARKS
1	SB1				
- 2	0 - 5	10	25	35	
3	5 - 10	15	20	70	
4	10 - 15	10	25	20	
5	15 - 20	5	20	20	
6	20 - 25	25	20	10	
7	25 - 30	25	20	5	
8	30 - 35	5	20	75	
9	35 - 40	10	20	160	
10	40 - 45	5	20	15	
11	45 - 50	10	20	45	
12	50 - 55	5	25	35	
13	55 - 60	10	20	250	
14	60 - 65	10	20	160	
15	65 - 70	5	25	65	
16	70 - 75	5	40	105	
17	75 - 80	5	25	60	
18	80 - 85	5	25	55	
19	85 - 90	10	25	230	
20	90 - 95	25	25	40	
21	95 - 100	5	25	45	
22	100 - 105	5	40	70	
23	105 - 110	10	25	55	
24	110 - 115	5	25	65	
25	115 - 120	5	25	40	
26	120 - 125	5	25	25	
27	125				
28	130				
29	P				
30					
31					
32	SB2				
33					
34	0 - 5	10	25	30	
35	5 - 10	10	25	20	
36	10 - 15	15	40	40	
37	15 - 20	10	20	10	
38	20 - 25	5	20	50	
39	25 - 30	5	20	15	
40	30 - 35	5	20	25	

PERUWATTY CORE SAMPLES (CONT.)

492

HOLE NO. SB 2

BATCH NO. 2

M.W.

T.T.	DEPTH	Cu	Pb	Zn	REMARKS
1	35 - 40	5	<20	22	
2	40 - 45	<5	<20	15	
3	45 - 50	<5	<20	15	
4	50 - 55	<5	<20	50	
5	55 - 60	<5	20	175	
6	60 - 65	<5	20	50	
7	65 - 70	<5	30	90	
8	70 - 75	5	50	155	
9	75 - 80	<5	30	90	
10	80 - 85	<5	30	80	
11	85 - 90	5	30	60	
12	90 - 95	5	30	50	
13	95 - 100	5	30	60	
14	100 - 105	5	30	70	
15	105 - 110	5	30	55	
16	110 - 115	5	30	60	
17	115 - 120	5	30	45	
18	120 - 125	<5	30	50	
19	125 - 130	<5	30	55	
20	130 - 135	<5	30	55	
21	135 - 140	5	30	60	
22	140 - 145	5	50	105	
23	145 - 150	<5	30	60	
24	150 - 155	<5	30	60	
25	155 - 160	<5	30	60	
26	160 - 165	<5	30	65	
27	165 - 170	<5	20	65	
28	170 - 175	5	20	60	
29	175 - 180	<5	30	55	
30	180 - 185	<5	30	55	
31	185 - 190	5	60	60	
32	190 - 195	<5	50	50	
33	195 - 200	<5	30	60	
34	200 - 205	5	30	80	
35	205 - 210	<5	30	50	
36	210 - 215	<5	30	60	
37	215 - 220	<5	30	55	
38	220 - 225	<5	30	45	
39	0				
40					

HOLE NO. SB3/SBH

BATCH NO. 3

M.N.

TT	DEPTH	Cu	Pb	Zn	REMARKS
1	0 - 5	10	20	15	SB3 * N.B. SEE 120'-140' BELOW
2	5 - 10	5	20	15	
3	10 - 15	5	20	20	
4	15 - 20	5	25	20	
5	20 - 25	10	25	15	
6	25 - 30	5	20	15	
7	30 - 35	5	20	10	
8	35 - 40	5	25	55	
9	40 - 45	<5	20	40	
10	45 - 50	5	25	40	
11	50 - 55	5	40	45	
12	55 - 60	5	40	45	
13	60 - 65	5	25	50	
14	65 - 70	5	25	50	
15	70 - 75	5	40	55	
16	75 - 80	5	25	50	
17	80 - 85	5	25	50	
18	85 - 90	5	20	50	
19	90 - 95	5	40	50	
20	95 - 100	5	20	50	
21	100 - 105	5	25	50	
22	105 - 110	5	20	60	
23	110 - 115	5	25	55	
24					SBH
25	0 - 5	10	20	30	
26	5 - 10	10	25	30	
27	10 - 15	5	25	60	
28	15 - 20	5	25	20	
29	20 - 25	5	20	25	
30	25 - 30	5	20	15	
31	30 - 35	5	20	15	
32	35 - 40	5	40	25	
33	40 - 45	<5	20	25	
34	45 - 50	5	20	25	
35	50 - 55	5	25	25	
36	55 - 60	5	20	20	SB3
37	120 - 125	5	20	15	
38	125 - 130	5	20	15	
39	130 - 135	5	20	25	
40	135 - 140	5	20	20	

PERUATY CORE SAMPLES (CONT.)

494

HOLE NO. 535

BATCH NO. 4

m.w.

T.T.	DEPTH	Cu	Pb	Zn	REMARKS
1	0 - 5	10	20	15	
2	5 - 10	10	25	15	
3	10 - 15	10	40	20	
4	15 - 20	15	25	25	
5	20 - 25	5	25	30	
6	25 - 30	5	20	25	
7	30 - 35	<5	20	15	
8	35 - 40	25	20	20	
9	40 - 45	25	20	15	
10	45 - 50	<5	<20	15	
11	50 - 55	5	20	30	
12	55 - 60	5	20	20	
13	60 - 65	10	20	10	
14	65 - 70	10	25	40	
15	70 - 75	10	<20	95	
16	75 - 80	10	30	80	
17	80 - 85	10	50	155	
18	85 - 90	10	30	120	
19	90 - 95	5	30	100	
20	95 - 100	5	30	90	
21	100 - 105	10	30	85	
22	105 - 110	5	40	65	
23	110 - 115	5	25	60	
24	115 - 120	5	30	50	
25	120 - 125	5	30	70	
26	125 - 130	5	30	90	
27	130 - 135	5	30	60	
28	135 - 140	5	30	80	
29	140 - 145	5	40	60	
30	145 - 150	5	30	65	
31	150 - 155	5	30	65	
32	155 - 160	5	30	65	
33	160 - 165	5	30	70	
34	165 - 170	10	300	100	
35	170 - 175	5	120	100	
36	175 - 180	5	50	85	

PERUVATTY CONE SAMPLES (CONT.)

495

HOLE NO. 536

BATCH NO.

M.W.

T.T.	DEPTH	Cu	Pb	Zn	REMARKS
	0 - 5	30	50	70	
	5 - 10	15	40	35	
	10 - 15	10	40	35	
	15 - 20	10	100	30	
	20 - 25	10	30	25	
	25 - 30	15	30	30	
	30 - 35	10	30	20	
	35 - 40	10	25	35	
	40 - 45	10	25	15	
	45 - 50	10	25	20	
	50 - 55	10	25	20	
	55 - 60	10	25	20	
	60 - 65	15	25	50	at. sand clay type.
	65 - 70	10	25	35	in clay
	70 - 75	10	25	50	
	75 - 80	10	40	55	
	80 - 90	95	30	70	
	90 - 95	230	50	65	
	95 - 100	305	50	75	
	100 - 105	255	30	70	
	105 - 110	85	30	70	
	110 - 115	60	50	55	
	115 - 120	75	390	75	
	120 - 125	45	50	55 75	} sand
	125 - 130	50	50	80 55	
	130 - 135	40	30	45 75	
	135 - 140	20	30	45	
	140 - 145	35	20	75	

PERWATTY CORE SAMPLES (CONT.)

496

HOLE NO. SB 7/8

BATCH NO.

M.W.

T.T.	DEPTH	Cu	Pb	Zn	REMARKS
1	0 - 5	15	30	65 40	SB 7
2	5 - 10	10	20	75 25	
3	10 - 15	15	20	40 30	
4	15 - 20	15	20	70 20	
5	20 - 25	15	20	85 25	
6	25 - 30	10	20	75 30	
7	30 - 35	10	20	75 15	
8	35 - 40	10	20	85 25	
9	40 - 45	10	20	75 20	
10	45 - 50	5	30	7 20	
11	50 - 55	10	30	20	
12	55 - 60	15	20	20	
13					
14					
15					
16					
17					
18					
19					
20	0 - 5	15	30	35	SB 8
21	5 - 10	10	50	25	
22	10 - 15	10	30	40	
23	15 - 20	10	20	35	
24	20 - 25	10	20	25	
25	25 - 30	15	20	25	
26	30 - 35	10	30	25	
27	35 - 40	10	30	25	
28	40 - 45	10	20	20	
29	45 - 50	10	20	40	
30	50 - 55	10	20	60	
31					
32					
33					
34					
35					
36					
37					
38					
39					
40					

PERUVATTY COLE SAMPLES (CONT.)

497

HOLE NO. SB 9/10

BATCH NO.

M.W.

T.T.	DEPTH	Cu	Pb	Zn	REMARKS
-	0 - 5	10	20	30	SB 9 went to 120
	5 - 10	10	20	25	
	10 - 15	10	20	20	
	15 - 20	10	20	25	
	20 - 25	10	20	20	
	25 - 30	5	30	10	
	30 - 35	10	20	25	
	35 - 40	10	30	45	
	40 - 45	10	30	35	
	45 - 50	10	20	50	
	50 - 55	10	20	70	
	55 - 60	10	30	80	
	60 - 65	10	30	65	
	65 - 70	10	30	95	
	0 - 5	15	20	40	SB 10
	5 - 10	15	20	35	
	10 - 15	15	30	40	
	15 - 20	10	20	65	
	20 - 25	10	30	65	
	25 - 30	10	20	50	
	30 - 35	10	40	85	
	35 - 40	10	20	70	
	40 - 45	15	90	115	

PERUWATTY CORE SAMPLES (CONT.)

498

HOLE NO. 5B6

BATCH NO.

M.W.

-80#

ALL VALUES IN PPM

J.T.	DEPTH (FEET)	Cu	Pb	Zn	REMARKS
1	50 - 55	5	20	20	Recheck of anomalous values.
2	55 - 60	5	20	10	
3	60 - 65	10	<20	40	
4	65 - 70	10	20	30	
5	70 - 75	10	30	40	
6	75 - 80	10	20	60	
7	80 - 90	115	30	65	
8	90 - 95	270	40	65	
9	95 - 100	295	40	60	
10	100 - 105	250	30	55	
11	105 - 110	90	30	60	
12	110 - 115	60	20	65	
13	115 - 120	85	370	60	
14	120 - 125	45	30	70	
15	125 - 130	65	40	100	
16	130 - 135	30	30	60	
17	135 - 140	25	40	55	
18	140 - 145	30	20	60	
19					
20					
21					
22					
23					
24					
25					
26					
27					
28					
29					
30					
31					
32					
33					
34					
35					
36					
37					
38					
39					
40					

PART 1

BORES OF THE

NORTHERN GAWLER CRATON

CORE ANALYSES AND LITHOLOGS

MT. CHRISTIE HOLES CD1, CD2 and CD5

WALLIRA No. 1

MT. FURNER No. 1

MT. WOODS HOLES 1-7

LAKE PHILLIPSON BORE

STUART RANGE No. 2 BORE

PART 2

BORES OF THE

TARCOOLA AREA, GAWLER CRATON

CORE ANALYSES

TARCOOLA BORES TD1, TD2, TD3 and TD4

GEOLOGIST WELL

KYCHERING WELL

MALBOOMA COAL BORES 1, 2, 3 and 5

PART 3

BORES OF THE

SOUTHERN GAWLER CRATON

CORE ANALYSES

PENDRILL SLEAFORD No. 4

KERR-McGEE BORES A403-1, A403-2A, A403-3, A405-1

A405-2, A405-3, A405-3A, A405-3B, L502-1, L502-2,

L505-1 and L505-2

PART 3

BORE - SAMPLE ANALYSES
CLEVE UPLANDS AND LINCOLN UPLANDS
(EYRE PENINSULA) SOUTH AUSTRALIA

Maps : SI 53-8 Whyalla, SI 53-11 Lincoln.

Bores examined :

Pendrill Sleaford No. 4

Kerr McGee A403-1

Kerr McGee A403-2A

Kerr McGee A403-3

Kerr McGee A405-1

Kerr McGee A405-2

Kerr McGee A405-3

Kerr McGee A405-3A

Kerr McGee A405-3B

Kerr McGee L502-1

Kerr McGee L502-2

Kerr McGee L505-1

Kerr McGee L505-2

LATITUDE LONGITUDE

BORE HOLE RECORD

INDEX NO.

34°50' 46"S

135° 44' 33'E

NAME OF BORE/WELL: SLEAFORD NO. 4

GEOLOGIC AREA :

_____ :

_____ :

_____ :

NOTES ON LOCATION :

DATE COMPLETED : Pendril Ltd., 1964

ABBREVIATED LOG : Aestianite (Pleist.) 0-280 ; L. Tert. lignitic sands + py. + clays 280-435 ; Archean basement 435-520
? amphibolite with crystalline pyrite.

REFERENCES : DTM Env. 384 : SR/11/5/71

REMARKS :

BORE HOLE ASSAYS

INDEX INC.

			NAME OF BORE/WELL: SLEAFORD NO. 4												
	Footage		Sample Type	Lithology	Formation	Cu	Pb	Zn	Co	Ni	Mn	Cr	Bg	Au	
Assay No.	From	To				b.p.m.	b.p.m.	b.p.m.	b.p.m.	b.p.m.	b.p.m.	b.p.m.	b.p.m.	b.p.m.	b.p.m.
22667	445	450	core 2	Amphibolite. clay	Prot.	95	30	20	35	5	2400	25	<1	<3	
22668	450	490	conings.	Siliceous metam rock Pyrite abundant.		20	25	35	75	35	5300	120	<1	<3	
22669	490	500	"	quartz & other metam rocks Abundant Pyrite? metab.		25	20	35	50	35	3700	60	<1	<3	
22670	500	510	"	quartz, mica amphibolite Abundant pyr le		20	20	35	100	100	4450	90	<1	<3	
22671	510	520	"	quartz, mica amphibolite Abundant pyr le		35	10	40	30	15	3050	35	<1	<3	
22672	520	522	"	"		35	20	40	30	15	3050	35	<1	<3	
22673	522	528	core 3	Amphibolite pyrite		25	15	75	15	15	1700	50	<1	<3	

LATITUDE LONGITUDE

BORE HOLE RECORD

INDEX NO.

33° 31' 20"

136° 28' 15" S

NAME OF BORE/WELL: KERR - MCGEE A403/1

GEOLOGIC AREA : GAWLER CRATON

_____ :

_____ :

_____ :

NOTES ON LOCATION : Cowell - Clare Area.DATE COMPLETED : 1968ABBREVIATED LOG :

0-50 clay & sand

50-105 gneiss - fels. - qtz - ferromagnes. ; manganoferous & ferruginous veinlets.

105-110 pegmatite and pegmatitic gneiss - coarse. Fe + Mn oxides.

110-125 gneiss - granitic and pegmatitic. Fe + Mn oxides.

125-143 gneiss + schist. Crystalline. Chloritic rock with biotite, fels. qtz. Graphite and/or pyrite below 127'.

143-167 schist. Gneissic in places. Graphitic at 166'.

167-170 gneissic granite, gneiss and schist layers.

170-194 schist and gneissic qtz. Thin gneissic layers in schist. Abundant graphite.

194-200 graphitic schist.

REFERENCES :

DTM Env. 1108

REMARKS :

8 samples

BORE HOLE ASSAYS

INDEX NO.

			NAME OF BORE/WELL: KERR MCGEE A403/1											
	Footage		Sample Type	Lithology	Formation	Cu	Pb	Zn	Co	Ni	Mn	Cr	Ag	
Assay No.	From	To				t.p.m.	t.p.m.	t.p.m.	t.p.m.	t.p.m.	t.p.m.	t.p.m.	t.p.m.	
25409	95	110	CORE	See log. ENV 1108 VOT & A.H.W.D.		110	20	70	20	5	6500	30	<1	
25410	110	129				85	25	110	20	15	2100	35		
25411	130	140				55	20	140	20	5	9000	120		
25412	140	151				95	20	120	20	15	1600	25		
25413	151	162				75	10	140	20	20	650	25		
25414	162	173				45	10	140	20	25	630	20		
25415	173	184				55	5	180	50	30	2000	30		
25416	184	200				55	10	180	25	35	720	50		

ASSAY TECHNIQUE: A/AMDEL JOB NO. 2685/72

LATITUDE LONGITUDE

BORE HOLE RECORD

INDEX NO.

33° 32' 20" S

136° 28' 15" E

NAME OF BORE/WELL: KERR MLGEE A403/2A

GEOLOGIC AREA : GAWLER CRATON

_____ :

_____ :

_____ :

NOTES ON LOCATION : CORWELL - CLIVE AREADATE COMPLETED : 1962ABBREVIATED LOG :REFERENCES :

DTPM ENV. 1108

0-30 weathered gneiss; traces of graphite.
30-42 weathered schist, micaceous, feldspar.
42-59 weathered gneiss. feld. → clays.
59-83 fault gouge and weathered gneiss. fault gouge is manganeseiferous, talcose, chloritic, graphitic.
83-97 brown and sandy schist, manganeseiferous.
97-146 gneiss. Mn + Fe rich; graphitic in places.
146-150 gneiss and pegmatite. Pegmatite is granitic with secondary Mn oxides.

REMARKS : 5 samples

BORE HOLE ASSAYS

INDEX NO.

			NAME OF BORE/WELL: KERR MCGEE A403/2A													
	Footage		Sample Type	Lithology	Formation	Cu	Pb	Zn	Co	Ni	Mn	Cr	Ag			
Assay No.	From	To				b.p.m.	b.p.m.	b.p.m.	b.p.m.	b.p.m.	b.p.m.	b.p.m.	b.p.m.	b.p.m.	b.p.m.	
25436	100	110	Core	See log. Gneisses & Mn content		120	70	260	55	60	1.3%	40	2 ² / ₄			
25437	110	119				140	60	190	10	20	1.1%	35	1			
25438	119	130				130	80	300	20	25	1.5%	30	<1	*		
25439	130	139.7				85	30	200	25	20	5200	35	<1			
25440	139.7	150				110	40	160	20	20	6900	35	<1			

LATITUDE LONGITUDE

BORE HOLE RECORD

INDEX NO.

33° 32' 20"

136° 28' 15"

NAME OF BORE/WELL: KEAR - MCGEE A403/3

GEOLOGIC AREA : GAWLER CRATON

_____ :

_____ :

_____ :

NOTES ON LOCATION : CLEVE UPLANDSDATE COMPLETED : 1968ABBREVIATED LOG : 0-30 no core

30-80 weathered gneissic schist. Sandy.

REFERENCES : 80-129 gneiss, quartzitic in parts, qtz. veins and augens, secondary Mn, graphitic; pyritic sulphides near 119'.

D.M. Env. 1102.

REMARKS : 4 samples

Log: R. Grasso, Mineral Services 1968.

BORE HOLE ASSAYS

INDEX INC.

			NAME OF BORE/WELL: KERR MCGEE A403/3												
Footage		Sample Type	Lithology	Formation	Cu	Pb	Zn	Co	Ni	Mn	Cr	Ag			
Assay No.	From				To	t.t.m.	t.t.m.	t.t.m.	t.t.m.	t.t.m.	t.t.m.	t.t.m.	t.t.m.	t.t.m.	
25457	80	90	CORE	See log.											
25458	90	102.6			100	10	85	25	25	1.4%	40	<1			
25459	102.6	115			220	25	100	40	25	1.7%	30	<1			
25460	115	129			130	360	570	95	130	1.4%	25	<1			
					180	90	280	110	70	1.5%	30	<1			

LATITUDE LONGITUDE

BORE HOLE RECORD

INDEX NO.

33° 34' 25"

136° 29' 45"

NAME OF BORE/WELL: KERR MCGEE A 405/1

GEOLOGIC AREA : GAWLER CRATON

_____ :

_____ :

_____ :

NOTES ON LOCATION : Radall 1M sheet AreaDATE COMPLETED : 1968 January.ABBREVIATED LOG :REFERENCES : D.M. ENV. 1108.

- 0-40 no core. Sludge of yellow-brown silic. ochre with abundant secondary Mn minerals.
- 40-75 Dolomite. Grey and cream-brown, hard, rough, siliceous. Brecciated, weathered. Abundant fine black ?manganiferous specks in places; occasionally ochreous.
- 75-110 fault gouge and brecciated dolomite. fault gouge composed of mainly slickensided clay minerals and contains orange-yellow ferruginous stains. Dolomite is brecciated, partly silicified and shows boxwork weathering. Abundant ferrug. secondary minerals.
- 110-125 chert. Dk. grey, rough with abundant ?manganiferous silica.

6 samples

REMARKS : Log by Minnil Service.

Hole Represented 50° Bearing on N 126°.

BORE HOLE ASSAYS

INDEX NO.

			NAME OF BORE/WELL: KERR MCGEE A405/1											
Assay No.	Footage		Sample Type	Lithology	Formation	Cu	Pb	Zn	Co	Ni	Mn	Cr	Ag	
	From	To				p.p.m.	p.p.m.	p.p.m.	p.p.m.	p.p.m.	p.p.m.	p.p.m.	p.p.m.	
25378	40	51	CORE	See log.		50	35	390	35	75	2700	30	<1	
25379	51	60				75	20	380	30	70	3900	45	<1	
25380	60	73				75	15	460	35	110	3600	25	<1	
25381	73	85				50	15	120	<5	25	360	55	1	
25382	85	105				260	25	820	25	110	380	50	<1	
25383	105	125				65	5	430	20	50	4700	190	<1	
				Sulphide breccia?										

ASSAY TECHNIQUE: AAMDEL JOB NO. 2544/72

LATITUDE LONGITUDE

BORE HOLE RECORD

INDEX NO.

33° 31' 25" S

136° 29' 45" E

NAME OF BORE/WELL: KERR-MCGEE AA05/2

GEOLOGIC AREA : GAWLER CARTON

_____ :

_____ :

_____ :

NOTES ON LOCATION : CLEVE UPLANDSDATE COMPLETED : 1968ABBREVIATED LOG :REFERENCES :

DTM Env. 1108

0-13 no core

15-23 chert, manganiferous clay.

23-106 manganiferous and ferruginous dolomite, cherty in part.

106-170 brecciated dolomite; chloritic and graphitic fault gouge. Mn + Fe common.

170-184 recemented, brecciated schist ~ ferromagn. + gls. Graphite and pyrite common in places.

184-193 dolomite.

REMARKS : 16 samples

BORE HOLE ASSAYS

INDEX NO.

			NAME OF BORE/WELL: KERR MCGEE A405/2											
	Footage		Sample Type	Lithology	Formation	Cu	Pb	Zn	Co	Ni	Mn	Cr	Ag	
Assay No.	From	To				t.p.m.	t.p.m.	t.p.m.	t.p.m.	t.p.m.	t.p.m.	t.p.m.	t.p.m.	
25441	15	30	CORE	gossanous ls		85	30	390	30	75	1300	30	1	
25442	30	41				40	30	260	75	15	8800	10	1	
25443	41	55.6				15	30	45	20	5	1400	25	1	
25444	55.6	66				25	40	110	25	15	3000	10	1	
25445	66	76				5	30	95	55	20	7900	15	1	
25446		76				5	30	110	90	20	-	10	1	
25447	76	86				5	30	85	25	35	4500	30	<1	
25448	86	95				15	30	95	30	40	4000	30	1	
25449	95	106				15	20	70	25	40	3500	60	1	
25450	106	114.2				40	170	490	270	270	6100	35	<1	
25451	114.2	126				60	110	440	250	220	7600	40	1	
25452	126	132				65	90	930	280	320	1.1%	50	1	

ASSAY TECHNIQUE: A) AMDEL JOB NO. 2685/72

BORE HOLE ASSAYS

INDEX NO.

			NAME OF BORE/WELL: <i>KERR MC GEE A405/2</i>											
Assay No.	Footage		Sample Type	Lithology	Formation	Cu	Pb	Zn	Co	Ni	Mn	Cr	Ag	
	From	To				t.p.m.	t.p.m.	t.p.m.	t.p.m.	t.p.m.	t.p.m.	t.p.m.	t.p.m.	
25453	136.5	151.2	COAL			85	100	340	130	160	2300	50	5	
25454	151.2	162				180	710	620	75	95	820	35	2	
25455	162	176				60	110	460	30	90	490	50	1	
25456	176	193				55	60	540	30	85	3100	35	<1	

ASSAY TECHNIQUE: A/AMDEL JCS NO. 2685/72

LATITUDE LONGITUDE

BORE HOLE RECORD

INDEX NO.

33° 21' 25" S

136° 29' 45" E

NAME OF BORE/WELL: KERR-MCGEE A405/3A and KERR-MCGEE A405/3

GEOLOGIC AREA : GAWLER CRATON

_____ :

_____ :

_____ :

NOTES ON LOCATION : CLEVE UPLANDSDATE COMPLETED : 1968ABBREVIATED LOG :0-83 ~~metres~~ is stored as Hole A405/3

83-91 dolomite. Broken, with secondary Mn and Fe

91-124 fault gouge and breccia. Gneissic.

124-135 schistose gneiss. Carbonate with abundant qtz. veining and graphite.

135-157 brecciated Solormitic gneiss. Traces of pyritic sulphides; black chert.

REFERENCES :

DTM Env. 1102

REMARKS :

Log by Minoil Services 1962.

BORE HOLE ASSAYS

INDEX INC.

			NAME OF BORE/WELL: KERR MCGEE A405/3														
Footage		Sample Type	Lithology	Formation	Cu	Pb	Zn	Co	Ni	Mn	Cr	Ag					
Assay No.	From				To	p.p.m.	p.p.m.	p.p.m.	p.p.m.	p.p.m.	p.p.m.	p.p.m.	p.p.m.	p.p.m.			
25371	5	15	Cullings	See log.	75	60	95	60	110	3600	15	1					
25372	20	31.6	Core		20	5	20	15	20	2600	15	1					
25373	31.6	41			15	10	20	15	15	2600	10	1	#				
25374	41	51			20	20	20	35	40	2700	15	1					
25375	51	65			20	15	20	65	55	4300	10	1					
25376	65	74			15	40	95	65	110	2700	45	<1					
25377	74	83			15	110	25	110	110	1500	60	1					
					For continuation from 83 ft to 137 ft see Hole A405/3A												
ASSAY TECHNIQUE: A) AMDEL JOB NO. 2544/72																	

BORE HOLE ASSAYS

INDEX NO.

[illegible]

ASSAY TECHNIQUE: A/A AMDEL JOB NO. 2685/72

LATITUDE LONGITUDE

BORE HOLE RECORD

INDEX NO.

33° 34' 25" S

136° 29' 45" E

NAME OF BORE/WELL: KERR MCGEE A405 | 35

GEOLOGIC AREA : GAWLER CRATON

_____ :

_____ :

_____ :

NOTES ON LOCATION : CLEVE UPLANDSDATE COMPLETED : 1968ABBREVIATED LOG :

0-10 no core

10-90 dolomite, brown clay and chert.

90-99 siliceous dolomitic breccia.

99-111 chert, stylolitic, possibly after dolomite.

111-125 brecciated dolomite.

125-132 chert after dolomite.

132-168 dolomite; manganiferous veinlets. Traces of graphite.

REFERENCES :

DTM Env. 1108

REMARKS :

Logged by Minoil Services P/L, 1968.

BORE HOLE ASSAYS

INDEX NO.

NAME OF BORE/WELL: KERR MCGEE A405/3B

Assay No.	Footage		Sample Type	Lithology	Formation	Cu	Pb	Zn	Co	Ni	Mn	Cr	Ag		
	From	To				p.p.m.	p.p.m.	p.p.m.	p.p.m.	p.p.m.	p.p.m.	p.p.m.	p.p.m.		
25417	10	20	COTTINGS	See log.		20	20	30	25	30	2900	20	<1		
25418	20	30				20	20	25	25	50	3000	15			
25419	30	40				40	30	25	50	60	2300	15			
25420	40	50				45	50	40	110	75	3200	20			
25421	50	60				65	60	40	120	95	3300	20			
25422	60	70				45	55	55	120	95	3800	25			
25423	70	80				100	50	90	65	35	3500	75	1		
25424	80	90				120	60	110	70	160	4100	50	2		
25425	90	107	CORE			10	35	85	15	20	2400	40	<1		
25426	107	118				15	20	150	25	25	1800	130			
25427	118	132.3				5	10	140	20	25	1400	70			
25428	132.3	144.6				15	30	160	10	25	1200	110			

ASSAY TECHNIQUE: A/A AMDEL JOB NO. 2685/72

INDEX INC.

NAME OF BORE/WELL: KERR MCGEE A405/38														
Assay No.	Footage		Sample Type	Lithology	Formation	Cu	Pb	Zn	Co	Ni	Mn	Cr	Ag	
	From	To				t.p.m.	t.p.m.	t.p.m.	t.p.m.	t.p.m.	t.p.m.	t.p.m.	t.p.m.	
25429	144.6	157.8	CORE	Succ log		15	40	160	15	25	1300	50	<1	
25430	157.8	168	CORE			15	55	220	25	35	2000	30	2	

ASSAY TECHNIQUE: A) AMDEL JCS NO. 2636/72

LATITUDE LONGITUDE

BORE HOLE RECORD

INDEX NO.

33° 37' 50" S

136° 43' 35" E

NAME OF BORE/WELL: KERR-MCGEE 1502/1

GEOLOGIC AREA : GAWLER CANYON

_____ :

_____ :

_____ :

NOTES ON LOCATION : CLEVE UPLANDSDATE COMPLETED : 1968ABBREVIATED LOG :REFERENCES :

D ↑ M Env. 1108.

0-54 gneiss with pegmatite. Pegmatite at 27' & 34' of feldspar & quartz; schistose bands in gneiss.
54-114 schist with pegmatite. Amphibolitic, graphitic, some chlorite; pyrite at 80', 110'.
114-118 mylonitic schist; pyrite and graphite common.
118-138 schist and dolomite; schist is amphibolitic, dolomite contains to 5% pyrite at 137'.
138-158 dolomite and mylonite; pyritic. Mylonite contains scapolite.
158-173 schist and dolomite. Chloritic schist with pyrite traces.
173-193 gneissic quartzite with some amphiboles.

REMARKS :

Log by Minoil Serv. 1968

BORE HOLE ASSAYS

INDEX INC.

			NAME OF BORE/WELL: KERR-Mc GEE L502/1													
	Footage		Sample Type	Lithology	Formation	Cu	Pb	Zn	Co	Ni	Mn	Ca	Ag			
Assay No.	From	To				p.p.m.	p.p.m.	p.p.m.	p.p.m.	p.p.m.	p.p.m.	p.p.m.	p.p.m.			
25397	42	57	CORE			25	<5	20	<5	20	430	25	<1			
25398	57.4	74.2				140	5	25	15	35	500	15	<1			
25399	74.2	93.3				75	15	60	15	30	540	15	<1			
25400	93.3	107.9				95	5	40	20	50	800	20	<1			
25401	107.9	124.4				45	30	60	50	25	7100	75	<1			
25402	124.4	130				45	10	45	30	30	1900	130	<1			
25403	130	139				10	30	45	20	20	3000	25	<1			
25404	139	148				5	30	60	20	15	700	10	<1			
25405	148	157				5	30	120	20	15	1600	30	<1			
25406	157	166				35	30	110	25	15	1500	10	<1			
25407	166	175				25	20	95	25	25	930	30	<1			
25408	175	193				10	100	180	10	20	640	40	<1			
END																
ASSAY TECHNIQUE: A/A AMDEL JOB NO. 25397-25400 : 2544/72 25401-25408 : 2685/3																

LATITUDE LONGITUDE

BORE HOLE RECORD

INDEX NO.

33° 37' 20"

136° 47' 20"

NAME OF BORE/WELL: KERR MCGEE 1502/2

GEOLOGIC AREA : GAUWER CRATON

_____ :

_____ :

_____ :

NOTES ON LOCATION : Calcookra mine

DATE COMPLETED : 1969.

ABBREVIATED LOG : See across.

REFERENCES : DTM Env. 1108.

REMARKS : Hole Sited at Separation of 60° on bearing 343° M.

0-10 Sludge of qtz, chlorite + black ferromag. minerals

10-16 Amphibolite schist + pegmatite.

16-29 Amphibolite schist

29-29 Qtz-fels. - pegmatite.

29-32.5 Amphibolite schist. Dk. green-grey, hard, quartzitic.

32.5-63 Amphibolite schist with minor Dolomite lenses, quartzitic in places.

63-64.5 Brecciated gneissic schist + pegmatite. Schist is weathered and contains thin ($\frac{1}{16}$ " ferruginous vnlts.

64.5-65.5 Coarsely crystalline pegmatite

65.5-81 Amphibolite schist. Dk. grey-green, hard, quartzitic.

81-115 Amphibolite schist. Traces of pyritic sulphides.

115-120 Quartzitic amphibolite schist. Resembles hangfels. Dk grey, hard. Composed of finely crystalline ferromag. minerals, qtz, feldspar. May be chloritic in places. Pyritic sulphides common in trace amounts (vnlts $\rightarrow \frac{1}{2}$ " near 119')

120-155.3 Dolomite schist. Lt. grey-brown, coarsely crystalline; traces of green-black ferromag. minerals. Talose in part. Pyrite traces common.

155.3-163.5 Amphibolite schist (resembles hangfels)

163.5-168 Acid gneiss.

 $\left. \begin{array}{l} < 0.010\% \\ U_{208} \end{array} \right\}$

BORE HOLE ASSAYS

INDEX NO.

			NAME OF BORE/WELL: KERR MCGEE L502/2												
Assay No.	Footage		Sample Type	Lithology	Formation	Cu	Pb	Zn	Co	Ni	Mn	Cr	Ag		
	From	To				p.p.m.	p.p.m.	p.p.m.	p.p.m.	p.p.m.	p.p.m.	p.p.m.	p.p.m.		
25384	10	20	CORE			45	20	35	<5	10	130	15	<1		
25385	20	32				85	40	80	5	20	220	10			
25386	32	42				75	15	75	20	20	960	10			
25387	42	52				65	10	40 40	15	15	600	10			
25388	52	63				75	45	110	25	30	620	10			
25389	63	74				60	5	35	5	15	180	15			
25390	74	89				95	5	35	15	30	340	15			
25391	89	111				100	5	40	15	20	580	10			
25392	111	120				95	10	45	30	20	3600	40			
25393	120	128.6				55	20	45	20	35	9000	180			
25394	128.6	144.2				45	20	55	15	20	2600	25			
25395	144.2	161.8				60	30	110	15	25	2000	15			
ASSAY TECHNIQUE: A/A ANDEL JOB NO. 2544/72															
25396	161.8	168	END			15	10	75	15	30	460	65	<1		

LATITUDE LONGITUDE

BORE HOLE RECORD

INDEX NO.

33° 35' 35" S

136° 47' 20" E

NAME OF BORE/WELL: KERR-MCGEE 1505/1.

GEOLOGIC AREA : GAULER CANYON

_____ :

_____ :

_____ :

NOTES ON LOCATION : CLEVE UPLANDSDATE COMPLETED : 1962.ABBREVIATED LOG :

0-37 Limonitic and talcose clay. Manganiferous.

37-41 Weathered gneiss.

41-62 Clay, Mn/Fe oxides

62-71 Ferruginous gneiss. Kaolin and other clays.

71-79 Quartzite with diopside.

79-87 Pegmatite. Mn/Fe coatings.

87-96 Diopside.

96-98 Pegmatite; contains qtz. and Diopside.

98-104 Qz.; secondary; some ferromagnesian minerals.

104-157 Gneiss and quartzitic gneiss.

REFERENCES :

DPM Env. 1108

REMARKS :

Log by Minoil Service 10/26/62.

BORE HOLE ASSAYS

INDEX INC.

			NAME OF BORE/WELL: KERR MC GEE L505/1											
Footage		Sample Type	Lithology	Formation	Cu	Pb	Zn	Co	Ni	Mn	Cr	Ag		
Assay No.	From				To	b.p.m.	b.p.m.	b.p.m.	b.p.m.	b.p.m.	b.p.m.	b.p.m.	b.p.m.	
25474	41	62	CORE	See Log.	5	60	860	410	270	6.9%	20	<1		
25475	75	80	CORE		5	10	110	<5	35	2200	20	<1		
ASSAY TECHNIQUE: A/AANDEL JOB NO. 2685/72														

LATITUDE LONGITUDE

BORE HOLE RECORD

INDEX NO.

33° 35' 36" S

136° 47' 20" E

NAME OF BORE/WELL: KEAR-MCGEE L505/2

GEOLOGIC AREA : CAWLER CANYON

_____ :

_____ :

_____ :

NOTES ON LOCATION : CLEVE UPLANDSDATE COMPLETED : 1962ABBREVIATED LOG :

0-19 Silicified and ferruginous Solonchite. Green opaline silica.

19-24 Iron rich chert.

24-28 Fe/Mn oxides.

28-37 Ferruginous clay.

37-42 Clay, iron oxides and chert

42-69 Talcose clay.

69-75 Siliceous and limonitic chert. Dendrites.

75-104 Gneiss. Green inclusions.

104-114 Gneiss. Chloritic and granitic.

REFERENCES :

DPA Env. 1108

REMARKS :

Log by Mincil Service 1962.

BORE HOLE ASSAYS

INDEX NO.

			NAME OF BORE/WELL: KERR MC GEE L505/2												
	Footage		Sample Type	Lithology	Formation	Cu	Pb	Zn	Co	Ni	Mn	Cr	Ag		
Assay No.	From	To				p.p.m.	p.p.m.	p.p.m.	p.p.m.	p.p.m.	p.p.m.	p.p.m.	p.p.m.	p.p.m.	
25461	8	16	CORE	limonitic dolomite		15	25	1100	360	250	8100	35	<1		
25462	16	24				5	20	6800	640	510	2.9%	50			
25463		23				5	20	6600	410	1000	4.2%	20			
25464	24	32				15	20	6700	1100	1200	41%	10			
25465	32	41.6				5	20	2100	300	360	1.4%	70			
25466		35.6		siliceous, limonitic dolomite (gossanous?)		5	20	970	250	190	3.1%	30			
25467	41.6	52				15	90	1200	140	190	1.7%	25			
25468	52	66.6				5	15	440	30	75	3600	20			
25469	66.6	75.6				15	55	380	40	95	9000	15			
25470	75.6	84.2				5	10	75	<5	40	450	170			
25471	84.2	92.5				10	5	65	<5	50	150	95			
25472	92.5	102				55	20	45	25	25	1.1%	10			
ASSAY TECHNIQUE: A/PANDEL JOBS NO. 2685/72															
25473	102	114				5	15	50	10	40	1300	130			

STRATIGRAPHIC BORES OF THE
YORKE PENINSULA - ST. VINCENT GULF REGION

CORE ANALYSES

BLACKPOINT WELL No. 1

EDITHBURGH No. 1

GRANGE No. 1

PT. VINCENT No. 1

STANSBURY TOWN No. 1

STANSBURY WEST No. 1

ASARCO (AUSTRALIA) PTY. LTD. OPEN FILE ENVELOPE 1880 VOL. 1

STRATIGRAPHIC BORES OF THE
YORKE PENINSULA -
ST. VINCENT GULF REGION

BLACKPOINT WELL No.1

EDITHBURGH No.1

GRANGE No.1

PT. VINCENT No.1

STANSBURY TOWN No.1

STANSBURY WEST No.1

LATITUDE LONGITUDE

BORE HOLE RECORD

INDEX NO.

NAME OF BORE/WELL: BLACK POINT WELL NO. 1

GEOLOGIC AREA : YORK PENINSULA

NOTES ON LOCATION : O.E.L. 24 ; 4 miles S of Pine PointDATE COMPLETED : BEACH PETROLEUM 1964ABBREVIATED LOG : 2-M Cambrian. Unnamed arkose 574' - 605'REFERENCES : DPM ENV. 139REMARKS : Unit 555' - ?

BORE HOLE ASSAYS

INDEX NO.

[illegible]

LATITUDE LONGITUDE

BORE HOLE RECORD

INDEX NO.

NAME OF BORE/WELL: EDITHBURGH NO. 1

GEOLOGIC AREA : YORKE PENINSULA

NOTES ON LOCATION :DATE COMPLETED : Beach Rd. S.W.ABBREVIATED LOG : Purara - Kallara Form. 2266 - 3118
UProt. - L Camb. Transition beds 3118 - 3437 (ss-dolom.).

Precamb. 3437 - 3455

REFERENCES : DTM. ENV. 702REMARKS :

BORE HOLE ASSAYS

INDEX NO.

[illegible]

ASSAY TECHNIQUE: AMDL 508 2006/72 Ag, Co, Pb, Zn, As, Cu, Ni.

LATITUDE LONGITUDE

BORE HOLE RECORD

INDEX NO.

NAME OF BIRTH/DEATH: [REDACTED]

GEOLOGIC AREA : ST. VINCENT (10000000)

NOTES ON LOCATION : 1.3 miles NW of George R. R. Stn.

DATE COMPLETED : 20 Oct 1964

[illegible]

REFERENCES : 2001 E.O. 13526/10/5/71

RELATIVES: P. H. K. S. - 1963

1946-1975-1982

			NAME OF BORE/WELL: GRANGE No. 1											
Footage		Sample Type	Lithology	Formation	Cu	Pb	Zn	Au						
Assay No.	From				Ppm	Ppm	Ppm	Ppm						
22674	1880	1890	Cuttings	Shales + Quartzites	Mauritanian Prot.	5	25	90	43					
22675	1890	1900	"			5	25	85	Z					
22676	1900	1910	"			5	15	55	1					
22677	1910	1920	"			5	15	45	1					
22678	1920	1930	"			5	25	65	1					
22679	1930	1940	"			5	20	65	1					
22680	1940	1950	"			25	20	55						
22681	1950	1960	"			30	15	40						
22682	1960	1965	"			15	20	40						
22683	1965	1970	"			70	15	40						

ASSAY TECHNIQUE: $\frac{1}{A}$ AMDEL JOB NO. 2373/72

LATITUDE LONGITUDE

BORE HOLE RECORD

INDEX NO.

NAME OF BORE/WELL: PL. VINCENT NO. 1

GEOLOGIC AREA : ST. VINCENT CORP.

NOTES ON LOCATION : 2 miles NW of Pl. Vincent, St. Vincent

DATE COMPLETED : March 1961

ABBREVIATED LOG :

Drill - 10' - 20' - 30' - 40' - 50' - 60' - 70' - 80' - 90' - 100' - 110' - 120' - 130' - 140' - 150' - 160' - 170' - 180' - 190' - 200' - 210' - 220' - 230' - 240' - 250' - 260' - 270' - 280' - 290' - 300' - 310' - 320' - 330' - 340' - 350' - 360' - 370' - 380' - 390' - 400' - 410' - 420' - 430' - 440' - 450' - 460' - 470' - 480' - 490' - 500' - 510' - 520' - 530' - 540' - 550' - 560' - 570' - 580' - 590' - 600' - 610' - 620' - 630' - 640' - 650' - 660' - 670' - 680' - 690' - 700' - 710' - 720' - 730' - 740' - 750' - 760' - 770' - 780' - 790' - 800' - 810' - 820' - 830' - 840' - 850' - 860' - 870' - 880' - 890' - 900' - 910' - 920' - 930' - 940' - 950' - 960' - 970' - 980' - 990' - 1000'

REFERENCES : 1. 10' - 20' - 30' - 40' - 50' - 60' - 70' - 80' - 90' - 100' - 110' - 120' - 130' - 140' - 150' - 160' - 170' - 180' - 190' - 200' - 210' - 220' - 230' - 240' - 250' - 260' - 270' - 280' - 290' - 300' - 310' - 320' - 330' - 340' - 350' - 360' - 370' - 380' - 390' - 400' - 410' - 420' - 430' - 440' - 450' - 460' - 470' - 480' - 490' - 500' - 510' - 520' - 530' - 540' - 550' - 560' - 570' - 580' - 590' - 600' - 610' - 620' - 630' - 640' - 650' - 660' - 670' - 680' - 690' - 700' - 710' - 720' - 730' - 740' - 750' - 760' - 770' - 780' - 790' - 800' - 810' - 820' - 830' - 840' - 850' - 860' - 870' - 880' - 890' - 900' - 910' - 920' - 930' - 940' - 950' - 960' - 970' - 980' - 990' - 1000'

REMARKS : 1. 10' - 20' - 30' - 40' - 50' - 60' - 70' - 80' - 90' - 100' - 110' - 120' - 130' - 140' - 150' - 160' - 170' - 180' - 190' - 200' - 210' - 220' - 230' - 240' - 250' - 260' - 270' - 280' - 290' - 300' - 310' - 320' - 330' - 340' - 350' - 360' - 370' - 380' - 390' - 400' - 410' - 420' - 430' - 440' - 450' - 460' - 470' - 480' - 490' - 500' - 510' - 520' - 530' - 540' - 550' - 560' - 570' - 580' - 590' - 600' - 610' - 620' - 630' - 640' - 650' - 660' - 670' - 680' - 690' - 700' - 710' - 720' - 730' - 740' - 750' - 760' - 770' - 780' - 790' - 800' - 810' - 820' - 830' - 840' - 850' - 860' - 870' - 880' - 890' - 900' - 910' - 920' - 930' - 940' - 950' - 960' - 970' - 980' - 990' - 1000'

LATITUDE LONGITUDE

BORE HOLE RECORD

INDEX NO.

NAME OF BORE/WELL: STANBURY TOWN NO. 1

GEOLOGIC AREA : YORK PENINSULA

NOTES ON LOCATION : O.R.L. 24

DATE COMPLETED : 1967 Beach Petroleum

me upper milled 2423' - 2623' ; me calcic s/s and pyr. shale to dol. s/s 2623' - 3010' ; me s/s + shale 3010' - 3220' ;
me s/s, shale, dol. 3220' - 3442' ; me Milton Cong. 3442' - 3530' ; Le dol. 3530' - 4100' ; Le s/s, dol, shale
4100' - 4135'

REFERENCES : D.M. Env. 784

REMARKS :

BORE HOLE ASSAYS

INDEX NO.

			NAME OF BORE/WELL: STANBURY TOWN NO. 1												
	Footage		Sample Type	Lithology	Formation	Cu	Pb	Zn	As	Ba					
Sample No. Assay No.	From	To				Wt.	Wt.	Wt.	Wt.	Wt.					
22001	2615	2625	Core 8	Shale, sils; brach. replaced by galena, tr. py, chalc., sphal.	me upper Red bed	25	10	70	4.5	70					
22002	2916	2920	Core 9	Dense sils, slightly py; minor sphal.	me	5	* 110	* 100	10	* 140					
22003	3220	3230	Core 10	Calc. shale, rare chalc., sphal.	mid e	15	* 140	* 100	25	70					
22004	2600	2610	Cuttings	shale, sils inter-lasts, brachiopods partially replaced by galena; H, sphal., galena, chalc., dipr	mid e	45	10	* 280	15	150					
22005	2610	2620	"		me	25	15	* 130	35	150					
22006	2620	2630	"		me	* 70	20	* 130	30	220					
22007	2630	2640	"		me	35	20	* 900	50	80					
22008	2640	2650	"		me	25	35	* 1130	25	230					
22009	2900	2910	"	sils, hard, dense, dark grey, argill. sl. sandy, slightly pyritic, scattered sphaerulic	me	10	15	* 350	10	120					
22010	2910	2920	"		me	15	40	* 360	20	240					
22011	2920	2930	"		me	10	45	* 620	15	70					
22012	2930	2940	"		me	10	60	* 1100	10	130					

ASSAY TECHNIQUE: ANAL. J. 2. 100/72. CI (CO, Pb, Zn, Ni) BI (Ba) [X-ray, (low spec.)]

BORE HOLE ASSAYS

INDEX NO.

NAME OF BORE/WELL: STANSBURY TOWN NO. 1

Sample No. Assay No.	Footage		Sample Type	Lithology	Formation	Cu	Pb	Zn	Ni	Ba				
	From	To				ppm	ppm	ppm	ppm	ppm				
22013	2940	2950	Cuttings	Geddie ls → pt. shales → dol. ls black silt. calc. carbon. shales + pt. speckling below	Mid Cambrian	10	45	* 460	15	120				
22014	2950	2960	"			10	25	* 320	25	80				
22015	2960	2970	"			10	* 100	* 520	15	80				
22016	2970	2980	"			10	65	* 720	15	100				
22017	2980	2990	"			10	* 110	* 250	20	70				
22018	2990	3000	"			20	25	* 130	25	70				
22019	3000	3010	"			10	15	70	20	100				
22020	3010	3020	"			15	10	75	30	70				
22021	3020	3030	"	sk + dol.	Mid Cambrian	* 80	* 320	* 490	35	100				
22022	3030	3040	"			* 50	70	* 100	25	110				
22023	3040	3050	"			10	20	* 110	25	210				
22024	3050	3060	"			5	10	* 150	15	90				
22025	3060	3070	"			5	5	90	20	150				

ASSAY TECHNIQUE: ANAL. FOR ISCO/72. Cu (Cu Pb Zn Ni) Bi (Ba)

BORE HOLE ASSAYS

INDEX NO.

			NAME OF BORE/WELL: STANBURY TOWN NO.1												
	Footage		Sample Type	Lithology	Formation	Cu	Pb	Zn	Ni	Ba					
Sample No. Assay No.	From	To				ppm	ppm	ppm	ppm	ppm					
22026	3070	3080	Cuttings	s/s + shale	Mid. Cambrian	<5	10	60	15	160					
22027	3080	3090	"	s/s + shale		5	10	65	30	210					
22028	3090	3100	"			*35	10	60	40	130					
22029	3100	3110	"			10	5	*100	30	160					
22030	3110	3120	"			5	<5	70	30	200					
22031	3120	3130	"			5	5	*160	25	220					
22032	3130	3140	"			15	5	60	30	230					
22033	3140	3150	"			10	10	*160	30	160					
22034	3150	3160	"			*40	10	*120	25	140					
22035	3160	3170	"			*45	5	*55	40	90					
22036	3170	3180	"			*50	5	*90	40	70					
22037	3180	3190	"	*110	20	*150	*55	90							
22038	3190	3200	"	*110	*45	*100	*55	110							

ASSAY TECHNIQUE: AMUEL JCB 1500/72 CI (Cu, Pb, Zn, Ni) Bi (Ba)

BORE HOLE ASSAYS

INDEX NO.

NAME OF BORE/WELL:			STANBURY TOWN NO. 1												
Sample No. Assay No.	Footage		Sample Type	Lithology	Formation	Cu	Pb	Zn	N	Bo					
	From	To				p.p.m.	p.p.m.	p.p.m.	p.p.m.	p.p.m.					
22039	3200	3210	Collings	limestone,	Mid Cambrian	50	20	50	55	110					
22040	3210	3220	"	shale,		30	30	40	40	110					
22041	3220	3230	"	dolomite		35	15	50	30	70					
22042	3230	3240	"	calc. shale rare sulphide		35	*120	*150	30	50					
22043	3240	3250	"			15	*70	*290	30	160					
22044	3250	3260	"			15	*220	*330	30	110					
22045	3260	3270	"			20	*170	*330	30	210					
22046	3270	3280	"			15	55	*150	25	190					
22047	3280	3290	"			15	60	*190	30	140					
22048	3290	3300	"			15	115	*340	30	140					
22049	3300	3310	"			15	*75	*150	30	100					
22050	4000	4010	"	Siliceous, dolom.	Lower Cambrian	10	*420	*1550	20	160					
22051	4010	4020	"	shale		5	20	*110	30	310					

ASSAY TECHNIQUE: ANAL. 50% KOH/D, CI (Cu, Pb, Zn, N.) BI (Bo.)

BORE HOLE ASSAYS

INDEX NO.

NAME OF BORE/WELL:

STANBURY TOWN NO. 1

	Footage		Sample Type	Lithology	Formation	Cu	Pb	Zn	Ni	Bi					
Sample No. Assay No.	From	To				ppm.	ppm.	ppm.	ppm.	ppm.					
22052	11020	11030	Collings	S. Hutton, dolomite, shale.	Lower Cambrian	10	25	20	20	90					
22053	11030	11040	"			*75	15	50	20	20					
22054	11040	11050	"			15	25	40	20	130					
22055	11050	11060	"			10	*95	*180	20	50					
22056	11060	11070	"			10	35	65	20	720					
22057	11070	11080	"			5	35	60	10	300					
22058	11080	11090	"			5	5	35	30	90					
22059	11090	11100	"			5	30	30	20	60					
22060	11100	11110	"			5	15	45	20	100					
22061	11110	11120	"			*120	15	55	30	150					
22062	11120	11130	"			15	15	35	10	940					
22063	11130	11140	"			10	5	30	10	750					
22064	11140	11150	"			10	25	25	10	1160					
22065	11150	11160	"			5	20	30	25	500					

ASSAY TECHNIQUE: ANALYSED 303 1957/72; CI (Cu, Pb, Zn, Ni), BI (Bi)

LATITUDE LONGITUDE

BORE HOLE RECORD

INDEX NO.

NAME OF BORE/WELL: STANSBURY WEST NO. 1 WELL

GEOLOGIC AREA : YORKE PENINSULA

NOTES ON LOCATION :DATE COMPLETED : 1966ABBREVIATED LOG : Lower Camb. Parana - Koffara 3035' - 5375' Arkham gr. 5705' - 5725'
Upper Prec. s/s 5375' - 5705'REFERENCES : DPM Env. 1040 656REMARKS : 1/4 mi. S 090 - 5100 ; 5100 - 5130 ; 5220 - 5240.

BORE HOLE ASSAYS

INDEX NO.

			NAME OF BORE/WELL: STANSBURY WEST NO. 1 WELL												
Sample No. Assay No.	Footage		Sample Type	Lithology	Formation	Cu	Pb	Zn	Ag						
	From	To				l.p.m.	l.p.m.	l.p.m.	l.p.m.						
22198	5080	5090	Cuttings	Purana - Kulpura Ms.	Lower Cambrian	15	65	40	<1						
22199	5090	5100	"			10	* 310	* 220							
22200	5100	5110	"			10	25	25							
21201	5110	5120	"			10	55	40							
21202	5120	5130	"			15	45	55							
21203	5130	5140	"			15	50	35							
21204	5140	5150	"			30	65	40							
21205	5150	5160	"			25	* 120	20							
21206	5160	5170	"			15	* 170	70							
21207	5170	5180	"			15	20	15							
21208	5180	5190	"			30	5	15							
21209	5190	5200	"			* 55	40	10							
21210	5200	5210	"			* 80	25	15							

ASSAY TECHNIQUE: AMDEL JOB SECOD - AA Cu Pb Zn Ag

BORE HOLE ASSAYS

INDEX NO.

			NAME OF BORE/WELL: STANSBURY WEST NO. 1 WELL											
Sample No. Assay No.	Footage		Sample Type	Lithology	Formation	Cu	Pb	Zn	Ag					
	From	To				ppm	ppm	ppm	ppm					
21211	5210	5220	Cytinge	Parana-Kulpara Hs	L. Cambrian	40	20	10	<1					
21212	5220	5230	"			40	10	15						
21213	5230	5240	"			20	25	20						
21214	5240	5250	"			10	10	70						
21215	5250	5260	"			10	45	10						
21216	5260	5270	"			20	25	20						
21217	5270	5280	"			30	20	15						
21218	5280	5290	"			25	5	10						
21219	5290	5300	"			30	10	10						
21220	5300	5310	"			15	5	10						
21221	5310	5320	"			30	50	15						
21222	5320	5330	"			10	20	20						
21223	5330	5340	"			5	25	10						

ASSAY TECHNIQUE: AMDEL SUB. 2000/72 AA Cu Pb Zn Ag

BORE HOLE ASSAYS

INDEX NO.

[illegible]

ASSAY TECHNIQUE: AMDEL JOB 2000(7) A.A