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PE 908558

NARINGAL-1 (W1344)

# PALYNOLOGICAL REPORT

- originally Appendix 9 from WCR

SANTOS LTD.

NARINGAL-1 PALYNOLOGICAL REPORT

PE 908558

**SANTOS STRATIGRAPHIC SERVICES  
EXPLORATION SERVICES DEPARTMENT**

Palynology Report No. 2002/02

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Date: 20<sup>TH</sup> July 2002

**PALYNOLOGICAL REPORT NO. 2002/02  
PALYNOSTRATIGRAPHICAL ANALYSIS  
NARINGAL NO. 1**

**Santos Ltd**  
A.C.N. 007 550 923

Circulation: Geology Operations, Team Leader, EIC, Palynology Files

## Introduction

Nine sidewall core and six cuttings samples from Naringal No. 1 located in the Port Campbell Embayment, Victoria were examined palynologically so as to assess their palynostratigraphic position.

The palynostratigraphic results are presented on Table 1. Chart 1 outlines the palynostratigraphic scheme adopted (Partridge, 2001) and the known relationships of the palynological zones to the lithostratigraphy. Range charts of the palynomorphs identified in this study are presented in Appendix 1.

## Discussion

There is a discrepancy in the results obtained from the sidewall cores from the interval 1574.7 to 1576.7 metres (?Upper *H. trinalis* / *C. edwardsii* to *I. evexus* subzones) to those of the cuttings sample at 1575m (*G. ancoras* / *K. polypes* subzones). The sidewall cores were dominated by spore pollen whilst the cuttings sample was in comparison predominantly microplankton. The possibility that samples could have been switched in the laboratory was investigated but the absence of other samples with the characteristics of the cuttings sample within the processed batch would suggest that this is unlikely. Likewise, there is no obvious misfires or lost recoveries within this section of the sidewall core run.

## PALYNOSTRATIGRAPHICAL DATA

Table 1

SAMPLE	DEPTH (metres)	PALYNOSTRATIGRAPHICAL UNIT (Age)	INFERRED STRATIGRAPHICAL UNIT	REWORKED ELEMENTS		PRESER- VATION	YIELD	DIVER- SITY	REMARKS
				%	AGE				
Cuttings	1545	<i>I. cretaceum</i> Zone (Late Santonian)	Middle Belfast Mudstone (Unit Ci)			Good	Low	Mod.	Cuttings preparation dominated by microplankton including <i>O. porifera</i> and a diverse <i>Isabelidium</i> suite including <i>I. cretaceum</i> and <i>I. belfastense</i> . The co-occurrence of <i>I. rotundatum</i> and <i>I. pellucidum</i> are considered to be caved. Significant spore pollen recorded include <i>G. ancoras</i> , <i>H. elliotii</i> , <i>C. triplex</i> and <i>C. australiensis</i> .
SWC	1559.7	?Upper <i>P. mawsonii</i> to <i>T. apoxyxinus</i> Zones (Coniacian to Santonian)	Lower Sherbrook Group			Fair	Ext. Low	Very Low	Half kerogen slide only. Very low diversity assemblage dominated by saccate pollen predominantly <i>P. ellipticus</i> and <i>M. antarcticus</i> . Microplankton restricted (<10%).
Cuttings	1563	<i>O. porifera</i> Zone (Santonian)	Lower Belfast Mudstone (Unit B)			Fair	Low	Low	Assemblage dominated by <i>H. heteracanthum</i> (>40%) with prominent <i>Spiniferites</i> spp & <i>A. cruciformis</i> . Bisaccate pollen are common, predominantly <i>P. ellipticus</i> & <i>M. antarcticus</i> . Significant taxa include <i>I. balmei</i> and <i>O. porifera</i> . <i>C. striatocorum</i> was not located.
SWC	1574.7	?Upper <i>H. trinalis</i> / <i>C. edwardsii</i> to <i>I. evexus</i> subzones (Turonian) SEE DISCUSSION	?Waarre Sandstone (Unit B to Ca)			Good	Mod.	Mod.	Assemblage dominated by spores and pollen (80%) mostly <i>Cyathidites</i> spp, <i>Dictyophyllidites</i> spp and <i>P. ellipticus</i> . Significant elements include <i>R. admirabilis</i> , prominent <i>A. distocarinatus</i> , <i>I. intraverrucatus</i> , <i>H. proxistriatus</i> and <i>H. trinalis</i> . Microplankton component predominantly <i>C. edwardsii</i> .

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## PALYNOSTRATIGRAPHICAL DATA

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Table 1

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 Study: Naringal No. 1  
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SAMPLE	DEPTH (metres)	PALYNOSTRATIGRAPHICAL UNIT (Age)	INFERRED STRATIGRAPHICAL UNIT	REWORKED ELEMENTS		PRESER- VATION	YIELD	DIVER SITY	REMARKS
				%	AGE				
Cuttings	1575	<i>G. ancoras</i> / <i>K. polypes</i> subzones (Late Turonian) SEE DISCUSSION	Flaxmans Formation			Fair	Low	Mod.	Assemblage dominated by microplankton mostly <i>H. heteracanthum</i> with prominent <i>V. griphus</i> & <i>K. polypes</i> . <i>C. edwardsii</i> present Spore pollen component dominated by <i>Dilwynite</i> spp.
SWC	1576.7	<i>C. edwardsii</i> to <i>I. evexus</i> subzones (Turonian) SEE DISCUSSION	?Waarre Sandstone (Unit B to Ca)			Fair	Mod.	Mod.	Similar assemblage to SWC 1574.7. Assemblage dominated by spores and pollen (90%) mostly <i>Cyathidites</i> spp & <i>Dictyophyllidites</i> spp. Significant elements include <i>R. admirabilis</i> & prominent <i>A. distocarinatus</i> , Microplankton component predominantly <i>C. edwardsii</i> , rare <i>K. polypes</i> & <i>O. pulcherrimum</i> .
SWC 17	1582.7	<i>H. trinalis</i> / <i>C. edwardsii</i> subzones (Turonian)	Waarre Sandstone (Units A & B)			Fair	Mod.	Mod.	Assemblage dominated by spores and pollen (95%) mostly <i>Cyathidites</i> spp, <i>Dictyophyllidites</i> spp and <i>P. ellipticus</i> . Significant elements include <i>R. admirabilis</i> , <i>A. distocarinatus</i> and <i>H. trinalis</i> . Microplankton component includes <i>C. edwardsii</i> & <i>P. cretaceum</i> .
SWC	1590.7	<i>H. trinalis</i> / <i>C. edwardsii</i> subzones (Turonian)	Waarre Sandstone (Units A & B)			Fair	Mod.	Mod.	Assemblage dominated by spores and pollen (95%) mostly <i>Cyathidites</i> spp, <i>Dictyophyllidites</i> spp, <i>Cicatricosisporites</i> spp and <i>P. ellipticus</i> . Significant elements include <i>R. admirabilis</i> , <i>A. distocarinatus</i> , <i>T. trioreticulosus</i> , <i>I. intraverrucatus</i> and <i>H. trinalis</i> . Microplankton component includes <i>C. edwardsii</i> & <i>C. compactum</i> .

## PALYNOSTRATIGRAPHICAL DATA

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Santos  
 Study: Naringal No. 1  
 Author: G.R. WOOD

Table 1

SAMPLE	DEPTH (metres)	PALYNOSTRATIGRAPHICAL UNIT (Age)	INFERRED STRATIGRAPHICAL UNIT	REWORKED ELEMENTS		PRESER- VATION	YIELD	DIVER- SITY	REMARKS
				%	AGE				
SWC	1592.7	<i>H. trinalis</i> / <i>C. edwardsii</i> subzones (Turonian)	Waarre Sandstone (Units A & B)			Good	Mod.	Mod.	Assemblage dominated by spores and pollen (95%) mostly <i>Cyathidites</i> spp, <i>Dictyophyllidites</i> spp and <i>Dilwynites</i> spp. Significant elements include <i>R. admirabilis</i> , <i>A. distocarinitus</i> , <i>I. intraverrucatus</i> and <i>H. trinalis</i> . Microplankton component includes <i>C. edwardsii</i> , <i>O. operculata</i> , <i>K. polypes</i> & <i>C. compactum</i> .
Cuttings	1596	<i>H. trinalis</i> / <i>C. edwardsii</i> subzones (Turonian)	Waarre Sandstone (Units A & B)			Fair	Low	Low	Mixed assemblage. Some obvious cavings contamination. Significant elements include <i>T. trioreticulosus</i> and <i>H. trinalis</i> . Microplankton component includes <i>C. edwardsii</i> , <i>P. cretaceum</i> & <i>K. polypes</i> .
SWC 10	1600.7	? <i>P. mawsonii</i> Zone (Turonian to Early Coniacian)	Waarre Sandstone			Fair	Very Low	Ext. Low	Sparse assemblage. Spore pollen dominated (98%) mostly <i>Cyathidites</i> spp & <i>P. ellipticus</i> . Significant elements include <i>R. admirabilis</i> , <i>H. heteracanthum</i> & <i>Cyclonephelium</i> spp.
SWC 8	1605.7	<i>H. trinalis</i> / <i>C. edwardsii</i> subzones (Turonian)	Waarre Sandstone (Units A & B)			Fair	Mod.	Mod.	Microplankton (65%) dominate the assemblage mostly <i>Valensiella</i> spp, <i>Exochosphaeridium</i> spp and <i>Heterosphaeridium</i> spp. <i>C. edwardsii</i> prominent. Significant elements include <i>P. cretaceum</i> , <i>C. compactum</i> & <i>H. trinalis</i> .
SWC 6	1609.7	<i>C. edwardsii</i> subzone (Turonian)	Waarre Sandstone (Units A & B)			Fair	Ext. low	Ext. low	Kerogen slide only. Sparse restricted assemblage. Significant elements include <i>Oligosphaeridium</i> spp, <i>Heterosphaeridium</i> spp & <i>C. compactum</i> .

**PALYNOSTRATIGRAPHICAL DATA**

Table 1

Santos  
Study: Naringal No. 1  
Author: G.R. Wood

SAMPLE	DEPTH (metres)	PALYNOSTRATIGRAPHICAL UNIT (Age)	INFERRED STRATIGRAPHICAL UNIT	REWORKED ELEMENTS		PRESER- VATION	YIELD	DIVER SITY	REMARKS
				%	AGE				
Cuttings	1611	<i>H. trinalis</i> / <i>C. edwardsii</i> subzones (Turonian)	Waarre Sandstone (Units A & B)			Fair	Low	Low	Microplankton dominate the assemblage mostly <i>P. cretaceum</i> , <i>Exochosphaeridium</i> spp, <i>Cyclonephelium</i> spp and <i>Odontochitina</i> spp. <i>C. edwardsii</i> prominent. Significant elements include <i>P. cretaceum</i> , <i>C. compactum</i> & <i>H. trinalis</i> .
Cuttings	1638	??? <i>H. trinalis</i> / <i>C. edwardsii</i> subzones (Turonian)	???Waarre Sandstone (Units A & B)			Fair	Ext. Low	Ext. Low	Mixed extremely sparse cuttings assemblage. Significant elements include <i>H. trinalis</i> & <i>Cyclonephelium</i> spp. The assemblage could be totally derived from cavings contamination.





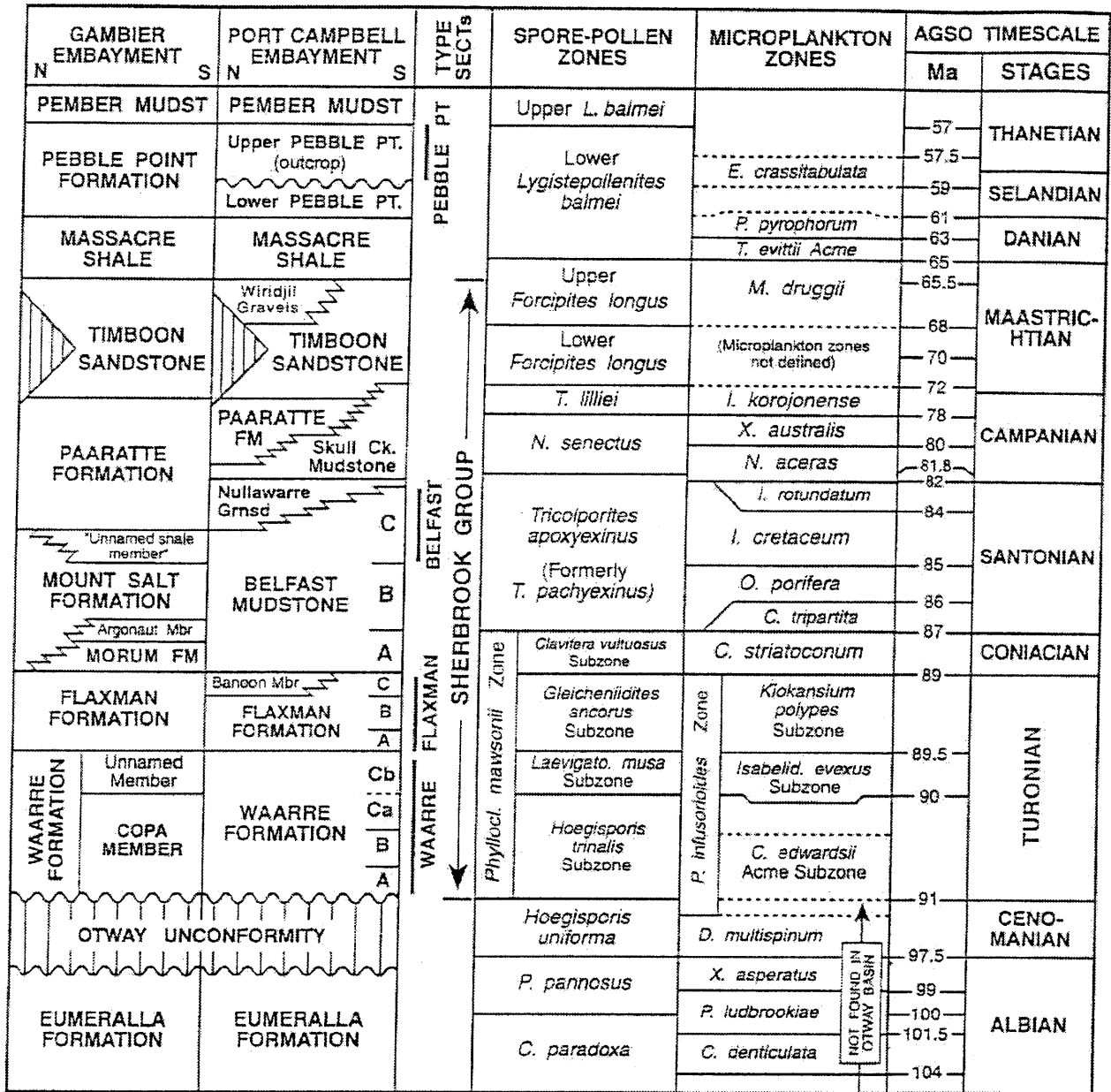
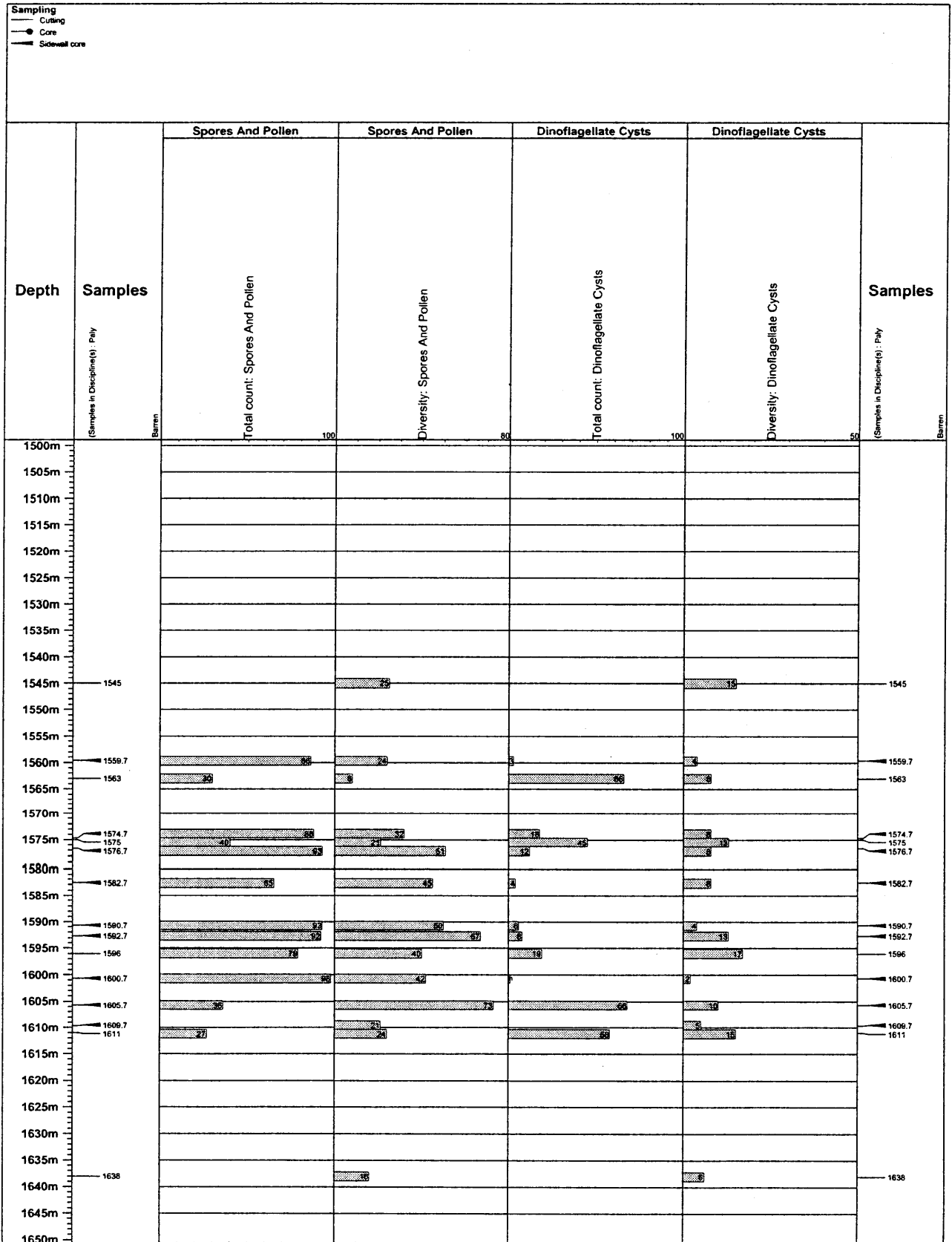


Chart 1. Sherbrook Group stratigraphy and palynological biostratigraphy (Partridge, 2001)

Well Name : Naringal No.1

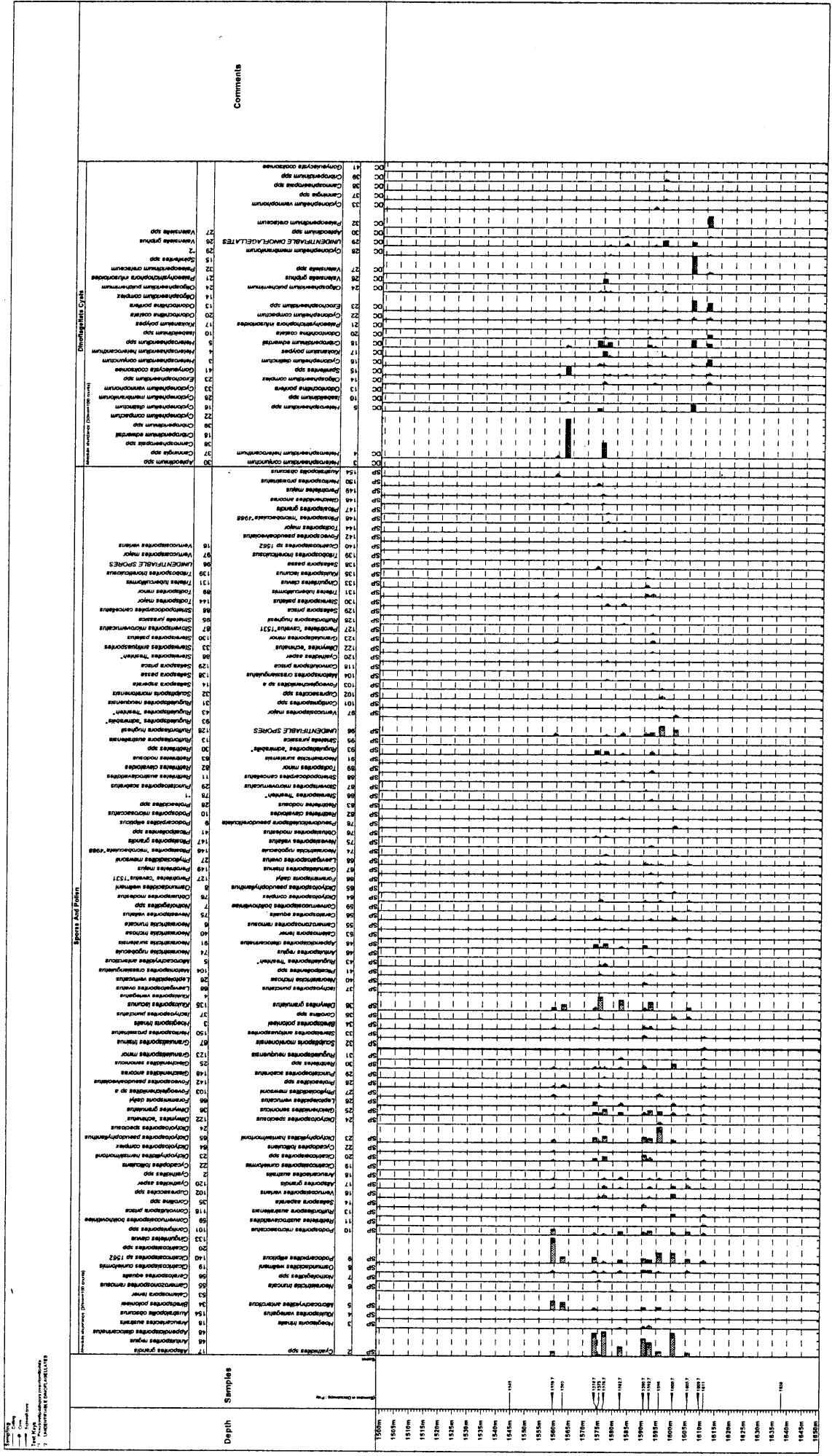
Santos Ltd  
Adelaide

Operator : Santos Spudded : 24 July 2002  
 Completed : 24 July 2002  
 Interval : 1500m - 1650m  
 Scale : 1:750  
 Chart date : 02 August 2002



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Well Name : Naringal No.1  
Operator : Santos  
Completed : 24 July 2002  
Interval : 1500m - 1850m  
Scale : 1:750  
Chart date : 08 August 2002



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Adelaide

Well Name : Heringel No. 1  
Depth : 14 July 2002  
Completed 24 July 2002  
Interval : 150m - 140m  
Bore : 11 1/8"  
Chart date: 12 August 2001

Depth	Samples	Comments
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