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T/25P PERMIT ASSESSMENT PROJECT

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Eastern Australia Team
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SUMMARY

The aim of the T/25P Permit Assessment Project was to study and define the prospectivity and hydrocarbon habitat of the Permit incorporating existing and new interpretations of the geological and geophysical data from within and around the Permit.

The study involved a major review of the overall structure, the stratigraphy of the Eastern View Coal Measures (EVCM), reservoir development in the EVCM, source rock, and source rock maturity within the Permit. The structure was assessed by reinterpreting all modern vintage seismic data, using for the first time an interactive geophysical workstation. A total of 13 seismic horizons were picked and mapped regionally, including 8 defining the structure of the prospective EVCM. Stratigraphic correlations have been compiled into a single regional correlation incorporating the most recent well data and palynology. In particular, an attempt has been made to subdivide the EVCM into smaller correlatable units to assist in the description of reservoir properties and the identification of reservoir, source rock and sealing units. Six correlatable units were identified within the EVCM in the Pelican Trough.

Previous studies have identified reservoir quality and distribution as significant risk factors in the Bass Basin, and therefore a detailed review of existing reservoir studies was conducted together with new studies designed to examine the controls on the distribution and quality of the reservoirs.

Source rock data were compiled and reviewed from T/25P and other parts of the Bass Basin and used in the calculation of new kinetic maturity models for the Pelican Trough. Isoreflectance maps using well-control and the new regional structural maps were created to identify mature source area.

Based on these new studies six major play types were identified in T/25P. The play types identified are:

- High side fault closures against NW-SE trending faults
- High side fault closures bounded by NW-SE trending faults and relay ramp faulting in the strike direction

- Low side fault closures against NW-SE trending faults (eg Clarke)

- Low side fault closures bounded by NW-SE trending faults and relay ramp faulting in the strike direction (eg Peron)

- Faulted anticlines

- Stratigraphic onlap/truncation/pinchout plays

No drillable prospects were identified due mainly to insufficient modern seismic control, but a total of 22 leads, divided into three Strong Leads (Grindstone, Hilliard and Tourville), fifteen Leads, including the large Clarke Lead and four Weak Leads were identified. An inventory of these leads has been assembled with descriptions, discussion of risk elements, recommendations for additional work, example seismic sections, and preliminary reserve calculations.

Many of the leads will be re-evaluated following an interpretation of the 1994 Rocky Cape Seismic Survey and newly reprocessed existing data. This work will then form the basis on which to determine future work in the Permit.

1 INTRODUCTION

1.1 Location

Permit T/25P is located in the offshore waters of the Bass Strait, northwestern Tasmania, approximately 55 kilometres north of the coastal town of Burnie (Figure 1.1). The Permit is located on the southwestern flank of the Cretaceous and Tertiary aged Bass Basin covering an area of approximately 2810 square kilometres. Water depth within T/25P ranges from 50 metres in the south western corner to 80 metres in the northeast.

1.2 Current Permit Interests

SAGASCO Resources Limited	45%
Ampol Exploration Limited	25%
Bridge Oil Ltd	20%
GFE Resources NL	10%

1.3 Permit Details

T/25P was granted on 2 December 1991 for an initial six year term comprising a guaranteed work program of three years followed by a further three year period with a secondary work program. An application for a revised secondary work program must be submitted to the Joint Authority no later than three months prior to the end of Year 3, that is three months prior to 1 December 1994, which is before 1 September 1994. Surrender of the permit may occur if the initial three year work program is completed and the Joint Venture do not wish to continue or if a revised secondary program cannot be agreed.

The secondary program becomes guaranteed on a year by year basis and must be carried out in the designated year.

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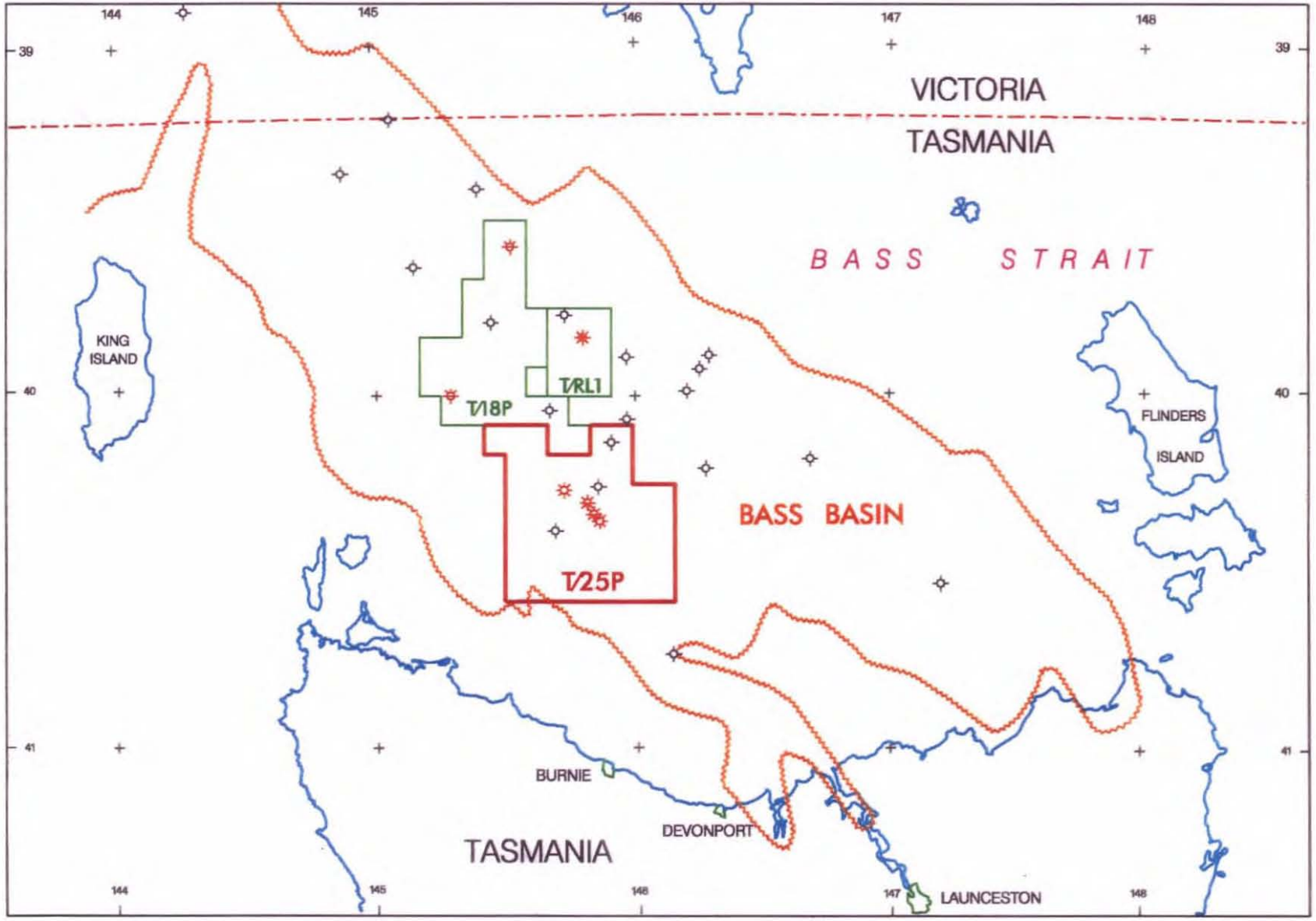

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BASS BASIN - TASMANIA

T/25P

LOCATION MAP

No: 10822.0794 FIG. 1.1

The initial and current permit area is 2810 square kilometres (43 five minute graticular blocks). After the initial six year term the permit may be renewed for a further 5 years subject to a relinquishment of 50%. Application for renewal is required before 1 September 1997.

1.4 Work Commitments and Permit Status

T/25P is currently in Year 3 of its first six year term. The permit is in good standing with all previous annual work commitments being fulfilled or exceeded. The permit was awarded with the following agreed Work Commitments:

TABLE 1.1

EXPENDITURE AND WORK COMMITMENT SUMMARY

YEAR	ENDING	COMMITMENT	INDICATIVE EXPENDITURE $
1	1/12/92	1 well	6,500,000
		500km seismic	600,000
		1000km reproc	100,000
		Environ., G&G studies	300,000
2	1/12/93	G&G review	200,000
3	1/12/94	250km seismic	300,000
		G&G, gas marketing	200,000
4	1/12/95	3D seismic	1,000,000
5	1/12/96	1 well	7,000,000
6	1/12/97	1 well	7,000,000

On 3 December 1993 the Joint Authority agreed to vary the conditions of the permit by exchanging the Year 2 commitment for Year 3. This report forms part of the Year 3 Geological and Geophysical review of the permit.

1.5 Permit History

T/25P was awarded following successful competitive bidding on 2 December 1991 to SAGASCO Resources Limited, Ampolex Limited, Bridge Oil Limited and GFE Resources Ltd. The permit was originally gazetted as area T91-2 and SAGASCO operated a Study Group which also included Ampolex Limited, Hadson Energy Limited and SANTOS Limited prior to bidding. As the result of the withdrawal of Hadson and SANTOS prior to bidding and the inclusion of GFE and Bridge it was agreed that in acknowledgment of the fact that SAGASCO had increased its equity to 45% it has the right to dilute its interest by 10% prior to any attempt by other Joint Venturers to dilute their interests.

During Year 1 the Joint Venture participated in the drilling of Flinders 1, acquired 559.7 km of seismic data as part of the Hunter Seismic Survey and reprocessed 1026 km of seismic data. Geological and geophysical studies included seismic attribute mapping using re-processed seismic data over the Pipipa Deep Prospect (Flinders) and Hunter Lead, planning of the Hunter Seismic Survey, preparation of the Flinders 1 drilling proposal, program and raw data report, and funding of an honours student for a project on diagenetic aspects of the Eastern View Coal Measures. A series of operational reports were also completed, these were:

Exploratory Drilling Project Bass Basin: Environmental Assessment, Dames and Moore.
Offshore Drilling Emergency Response Plan, Bass Basin Operations.
Oil Spill Contingency Plan, Bass Basin Operations
Safety & Offshore Drilling Operations Manual: Bass Basin

In Year 2 the geological and geophysical studies included completion of the Flinders 1 Well Completion Report and a major regional mapping was initiated, the results of which were used to select the Year 3 seismic program.

In Year 3, 263km of (full fold) seismic data were acquired during the Rocky Cape Seismic Survey, geological and geophysical studies continued, 1454 km of existing seismic data are being reprocessed and further work is planned to incorporate the results of the Rocky Cape Seismic Survey and newly reprocessed data prior to the end of the permit year.

2 REGIONAL GEOLOGY

2.1 Tectonic Evolution

The progressive dissection of eastern Gondwana occurred through five separate seafloor spreading episodes (Falvey, 1981). The intracratonic Bass Basin is one of a series of basins along the southern margin of Australia that were formed as a result of Cretaceous-Early Tertiary rifting between Australia and Antarctica. In particular episodes recognised in the Gippsland Basin (Lowry, 1991) are likely to be the key tectonic events in the Bass Basin's development. These are Southern Ocean rifting and spreading (from 120Ma to present) and the Tasman Sea rifting and spreading (from 98Ma to 52Ma).

The Bass Basin was initiated by NE-SW lithospheric extension, largely during the Early Cretaceous. The extensional stage was followed by a Late Cretaceous to Pliocene thermal subsidence stage and a late stage of compressional tectonic overprinting (Etheridge, 1985).

Major NW to SE longitudinal normal faults occurred in the Early Cretaceous rifting creating asymmetric depressions which dominated sediment accommodation until the early Eocene. Thereafter regional basin sag occurred more or less uninterrupted until the present day. Basin inversion in areas such as Cormorant is related to a compressional event during the Miocene. The present day major tectonic elements are presented in Figure 2.1 and detailed structural features are defined in Figure 2.2. A schematic cross section showing structural style is shown in Figure 2.3.

2.2 Stratigraphy

The stratigraphy of the central Bass Basin is only known from well control, however this together with the available regional seismic data allows correlation with subcropping rocks and well bores from the generically similar Otway and Gippsland Basins.

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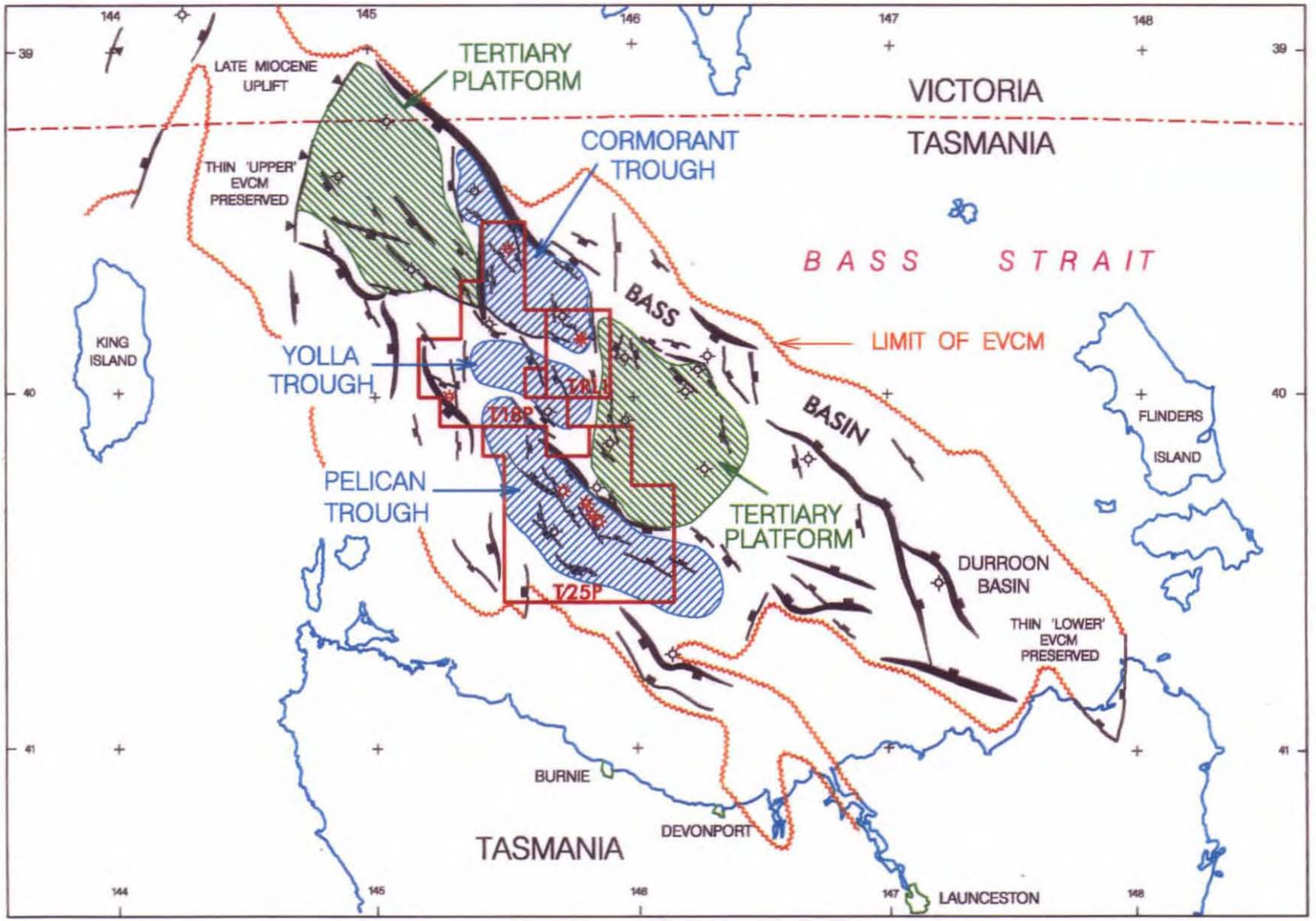

0 20 40 60
Kilometres

BASS BASIN – TASMANIA

TECTONIC ELEMENTS MAP

No: 10821.0794 FIG. 2.1

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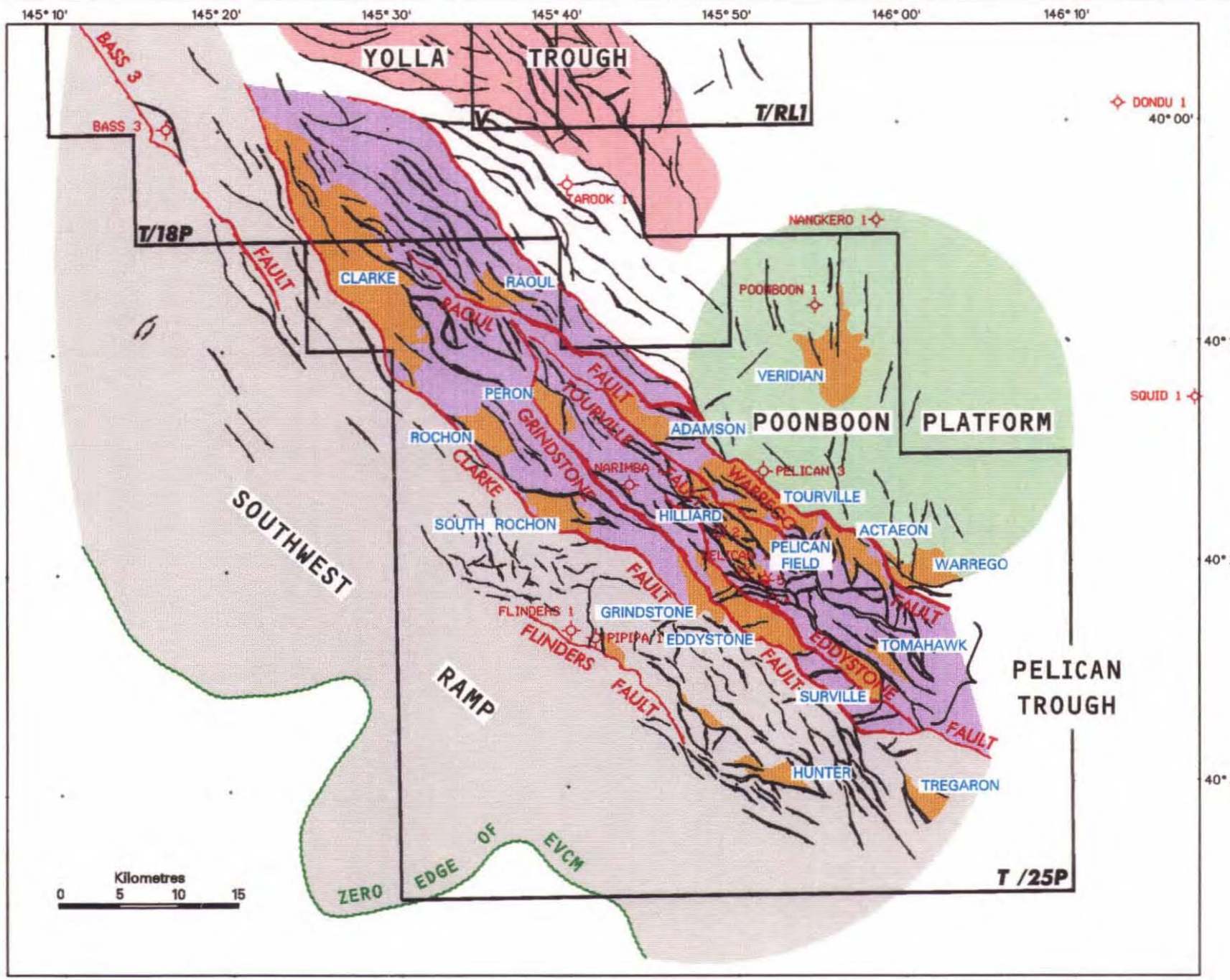
T /25P
STRUCTURAL ELEMENTS
(BASED ON TOP PALAEOCENE)



No: 10815.0794 FIG. 2.2

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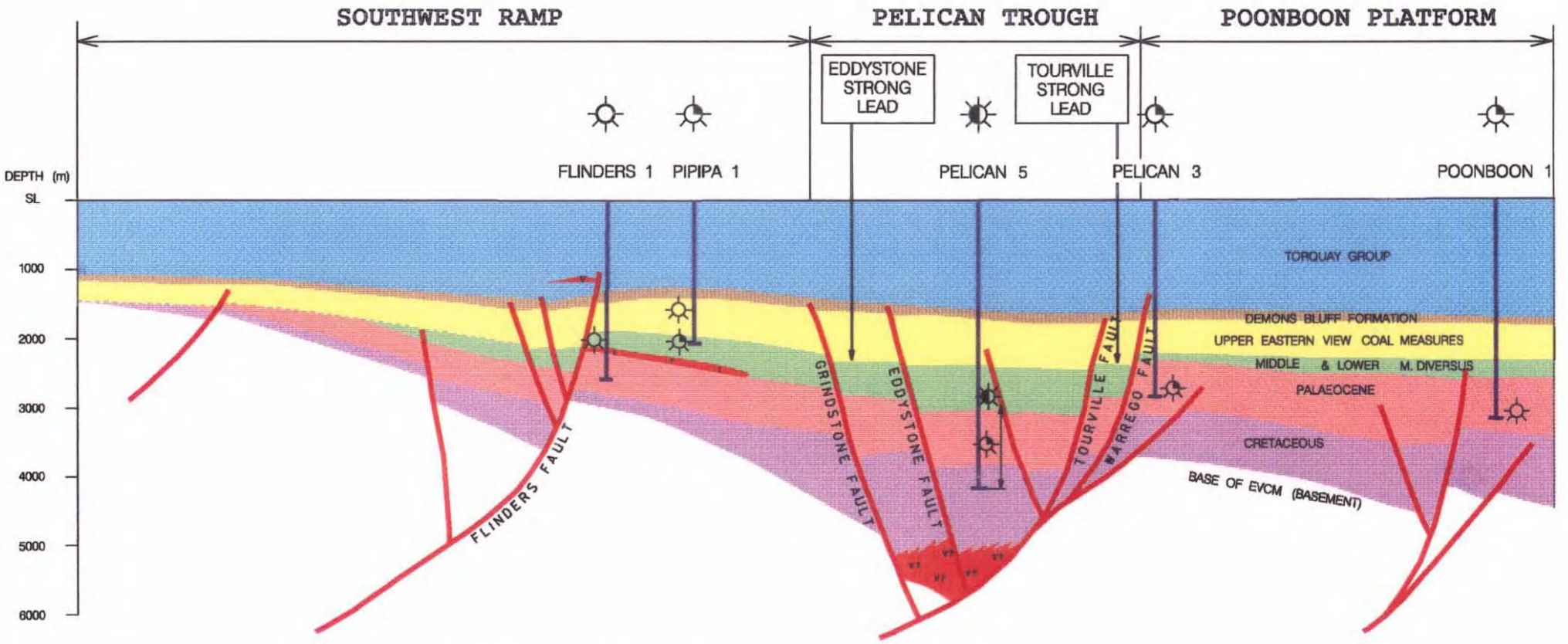
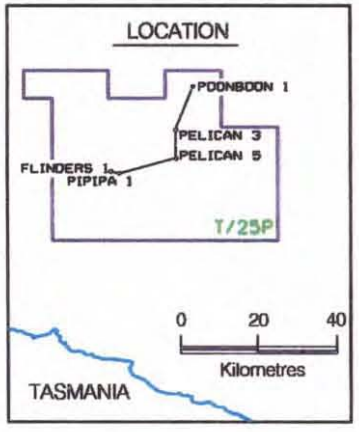
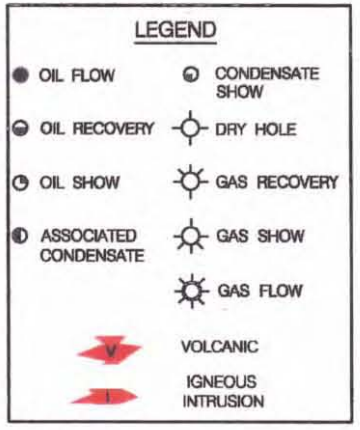






5 cm

BASS BASIN – TASMANIA

T/25P

SCHEMATIC STRUCTURAL CROSS SECTION

No: 10847.0794 FIG. 2.3

Basement in the Bass Basin is slightly metamorphosed and may be as old as 589my which is Cambrian in age. Bass 2 drilled through low-angled, altered tuffaceous mudstone radiometrically dated as Early Palaeozoic or Cambrian. Bass 3 reached TD in 40 degree dipping, silicified blackshale and quartzite sandstone and siltstone, believed to be Early Palaeozoic in age. The rocks apparently relate to the Palaeozoic geosynclinal sections in the onshore areas of Tasmania (eg Rocky Cape Group), Victoria and Islands of Bass Strait, where complexly folded, intruded and metamorphosed Palaeozoic rocks outcrop (Brown, 1976). This relationship can easily be inferred after studying a geosat bouguer gravity image produced by AGSO (Figure 2.4). The lineaments shown mainly relate to basement structure, and the geology can be extrapolated from northwestern Tasmania (Figure 2.5).

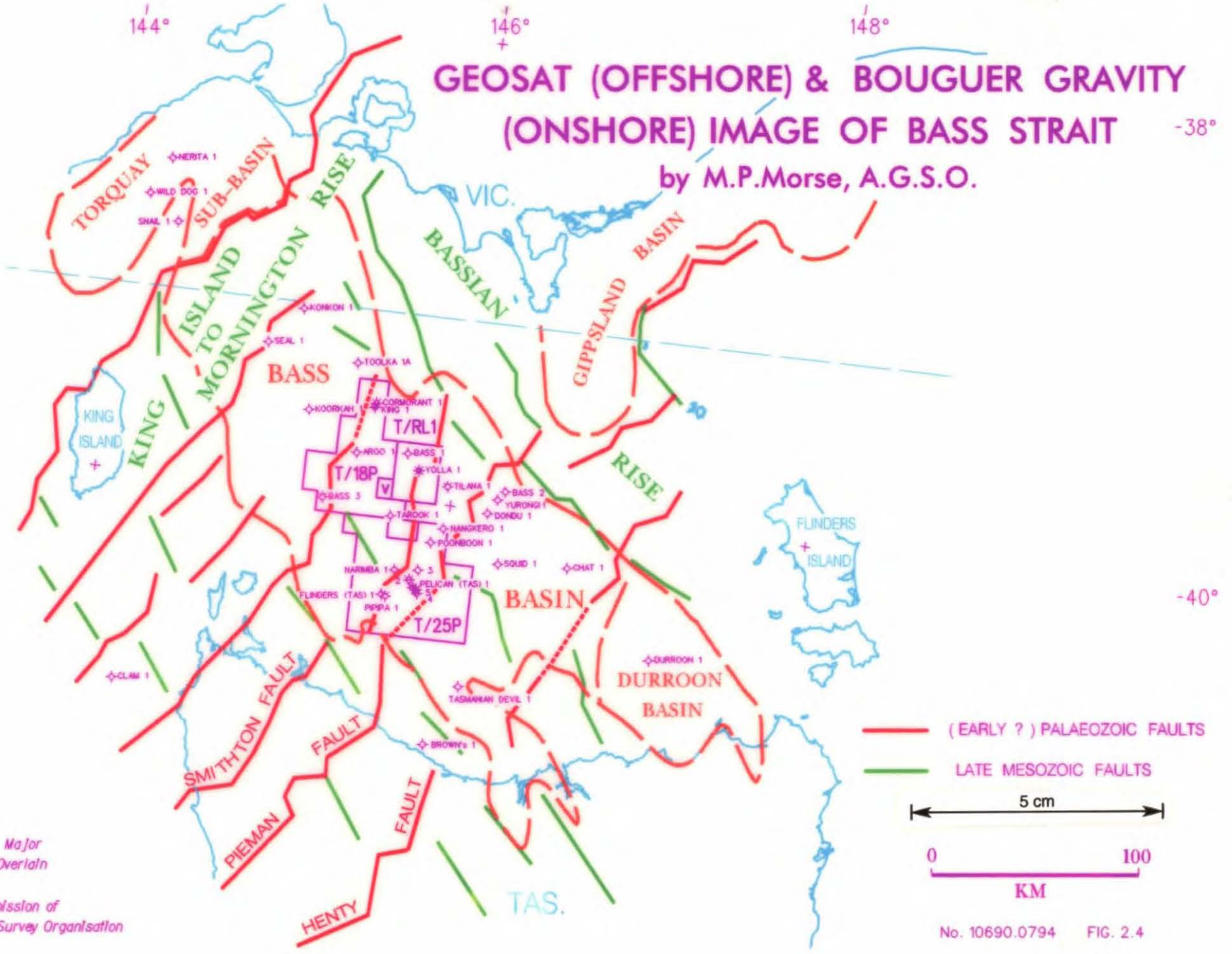
A generalised stratigraphic column for the Bass Basin is shown in Figure 2.6. A 1200m lower Cretaceous section similar to the Otway Group of the Otway Basin and the Strzelecki Group of the Gippsland Basin was seen in Durroon 1 (Brown, 1976), the only Bass Basin well to intersect this Early Cretaceous stratigraphy. The north west extension of the Tertiary Bass Basin overlaps the Otway Basin in the area of the "Torquay Embayment". There the Otway Group was penetrated by Shell's Nerita 1 (thickness 580m) and Haematite's Snail 1 (349m thick). Early Cretaceous sediments are also inferred to be in Konkon 1 due to the lithologies encountered (Brown, 1976).

The Early Cretaceous Basin received rapidly deposited and generally poorly sorted argillaceous and arenaceous terrigenous detritus from the Tasmanian provenance to the south. Major fault movements produced rapidly subsiding depressions and rugged, linear, mountainous islands. Some of the local sub basins are estimated to contain up to 3000m of lower Cretaceous section. Subsequently the erosion of the faulted island masses produced an unconformity which apparently marks the boundary between the Upper and Lower Cretaceous (Brown, 1976). This also marks the base of the Eastern View Coal Measures. The Late Cretaceous section is almost unknown as few wells have penetrated it, but it should infill linear deep basins present by the end of the Early Cretaceous. The uppermost part of the Late Cretaceous section has been penetrated by Aroo 1, Bass 3, Poonboon 1, Pelican 5 and Konkon 1 while at Durroon 1 a condensed sequence was encountered before the well drilled through to the Early Cretaceous section. The lithologies of the Late Cretaceous were sand, silt,

491023.

GEOSAT (OFFSHORE) & BOUGUER GRAVITY (ONSHORE) IMAGE OF BASS STRAIT

by M.P.Morse, A.G.S.O.



Regional Lineations & Major Structural Provinces Overlain

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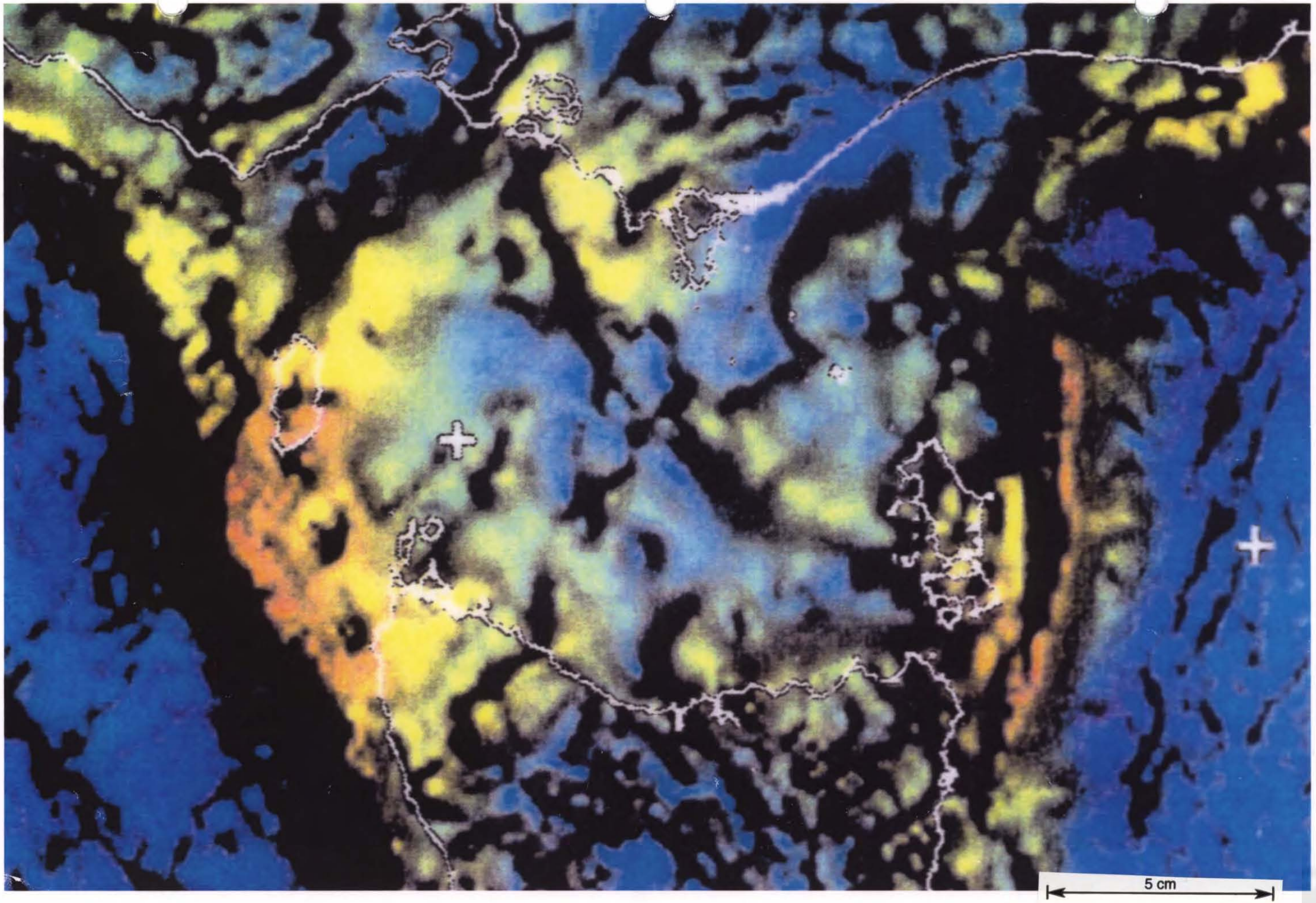
No. 10690.0794 FIG. 2.4


5 cm

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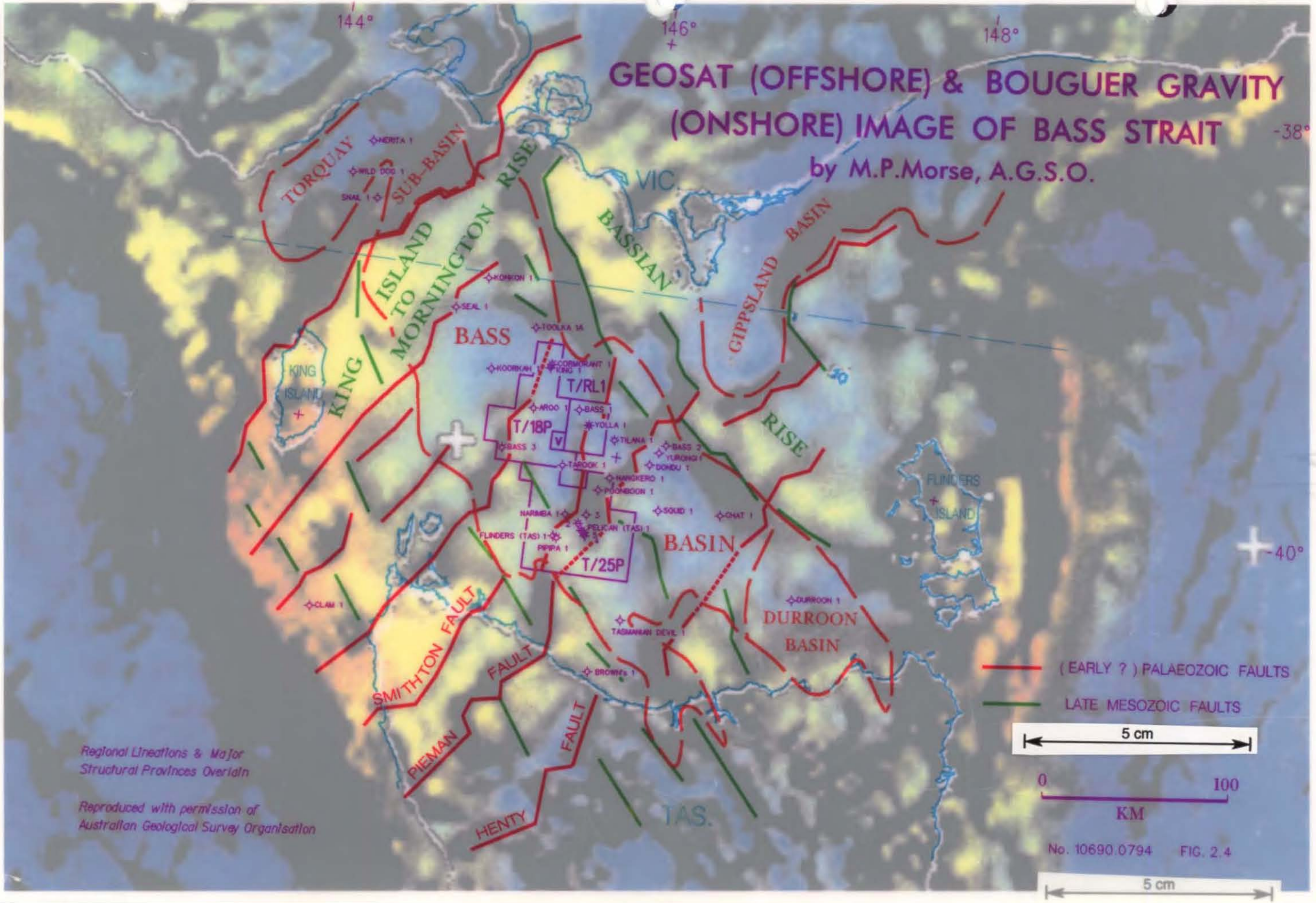
GEOSAT (OFFSHORE) & BOUGUER GRAVITY (ONSHORE) IMAGE OF BASS STRAIT

by M.P.Morse, A.G.S.O.



Regional Lineations & Major Structural Provinces Overlain

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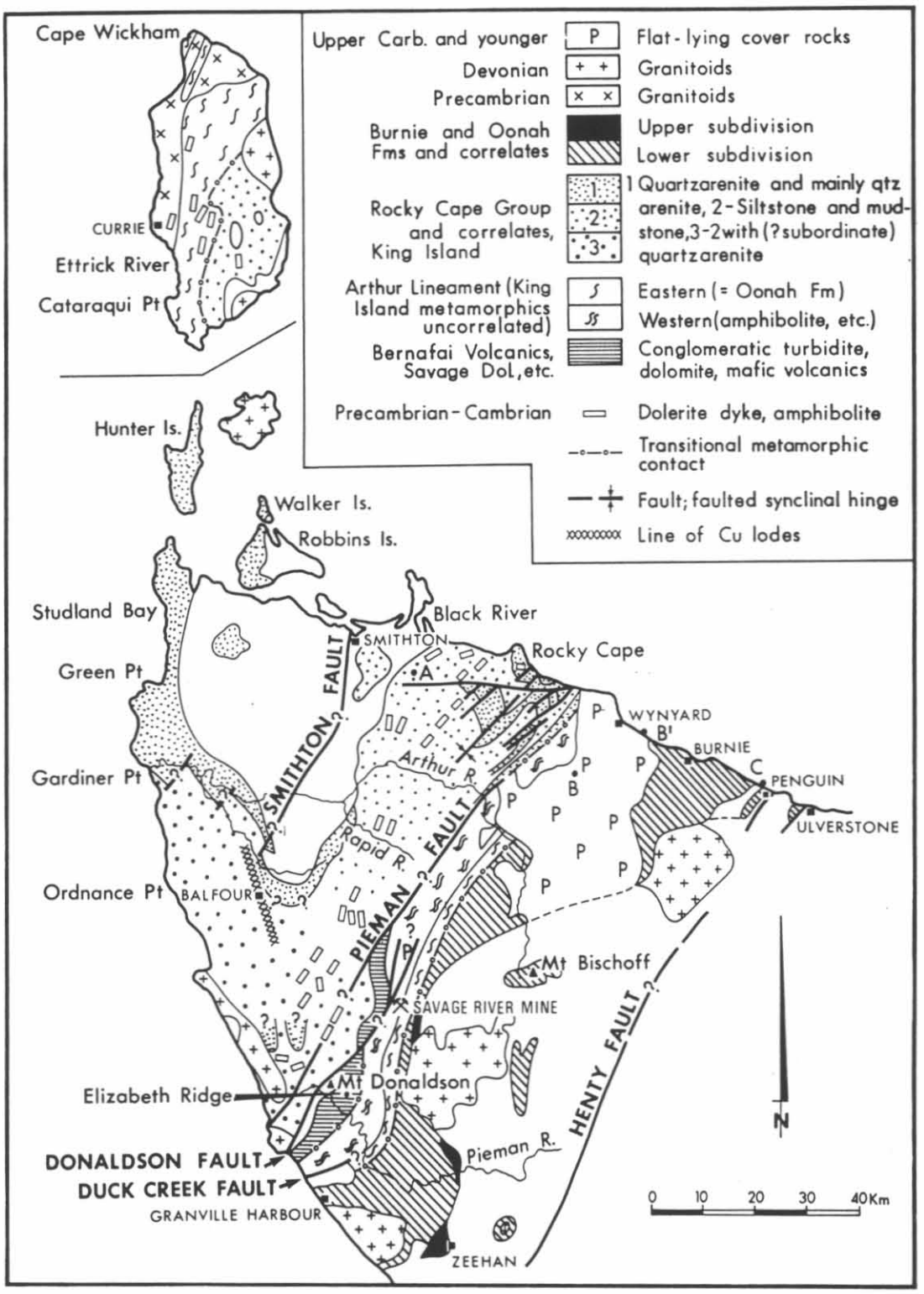
491025

SAGASCO Resources Ltd.



GEOLOGY OF THE ROCKY CAPE REGION AND KING ISLAND

From, Geology & Mineral Resources of Tasmania, 1989

5 cm

NO: 10855.0794 FIG. 2.5

SAGASCO Resources Ltd.

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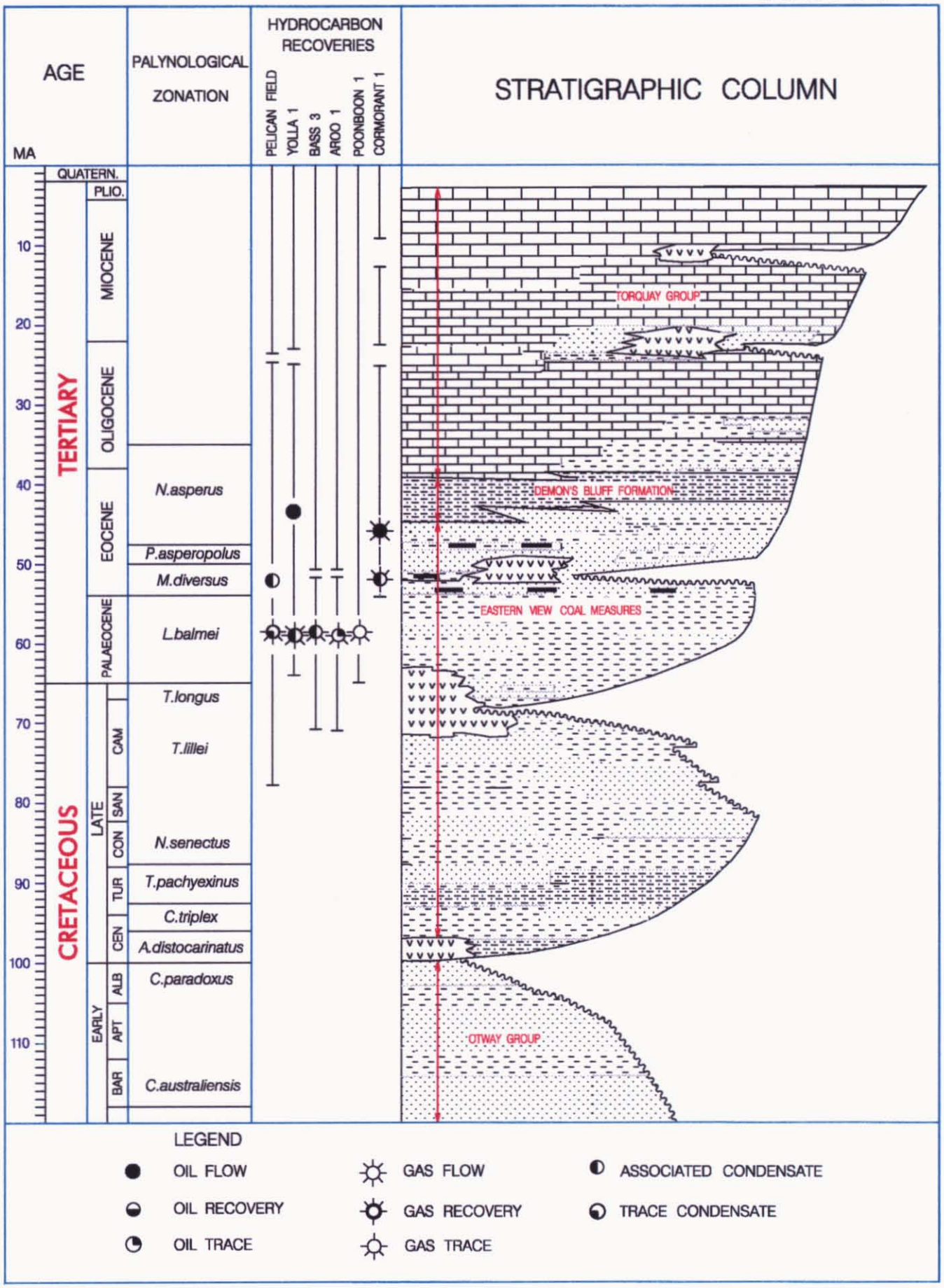


BASS BASIN – TASMANIA

STRATIGRAPHIC COLUMN

No: 10816.0794 FIG.2.6

shale and coal typical of the rest of the EVCM. These sediments were mainly sourced from the south (Tasmania) but subsidiary provenance areas were the "Bassian Rise" (Wilson's Promontory to Flinders 1 Island) as well as the Australian Continent to the north (Brown, 1976).

The Palaeocene provenance was still to the south as evidenced by coarse sandstone development at Durroon 1. The Palaeocene basin was a land locked deltaic plain which collected a minimum of 600m of fine sediments in the centre and 500m of coarse sediments on the margins. Structurally the Palaeocene was quiescent with relatively uniform thicknesses of sediments observed away from the Basin margins. Thick coals developed in the Eocene, particularly in the Pelican area, but by the end of the Early Eocene structural movements were intensified with extensive normal faulting aligned with and reactivating the basin forming NW-SE Cretaceous faults. Relief at any one time was not great so depositional patterns of environment remained generally constant.

Extensive erosion occurred at the end of middle *M.diversus* time peneplaining the faulted topography and marking an end to the "Lower EVCM" (Brown, 1987; Nicholas *et al* 1981; Baillie & Bacon, 1989). Up to 2000m of Lower EVCM may have been deposited. The basin depocentres became independent from the Cretaceous synrift basins at this time and the basin axis is longitudinally focussed in the Poonboon 1 area and trending NW-SE until the present day. The "Upper EVCM" commenced deposition in this new sag basin with the coaly upper *M.diversus*. Sometime after deposition of the upper *M.diversus* and possibly as late as middle *P.asperopolus* time, another regional unconformity occurred. This did not result in any change in the basin framework and probably is more accurately described as a sequence boundary resulting from a relative eustatic lowstand. The effect of this is minor subcrop of the upper *M.diversus* sediments over many of the older highs and at the basin margins. Some growth faulting persisted after this time but almost all fault movement had ceased by the time of the Demon's Bluff flooding event. The upper EVCM below the Demon's Bluff may be up to 1000m thick in parts.

The Demon's Bluff Formation was deposited at the conclusion of the Eocene and was transgressive over a vast area. The basin thereafter continued to subside and mostly fine-grained marine sediments were deposited in the low relief topography. Structural movements intermittent along fault lines produced drape structures. Thinning of Oligocene sediments, apparently due to subcrop at the Oligocene/Miocene boundary, suggests a reversal of the stress regime from extensional to compressional at this time. This is recognised in the Gippsland Basin and a S-SE compression has been suggested (Davidson, 1980). Early Oligocene uplift is seen in the Torquay Basin and the Otway Ranges probably underwent a major compression in the late Early Miocene.

3 PREVIOUS EXPLORATION

3.1 Introduction

The Bass Basin has only been relatively lightly explored, and encouraging indications of hydrocarbons have at times been encountered and tested. None of the discoveries so far has led to commercial development. BHP took out a permit covering the entire Bass Strait area in 1960 and in 1961 a regional aeromagnetic survey was flown. The subsequent 1962-1963 regional seismic survey provided data for basic concepts to be developed about the basin. In 1965 Esso commenced exploration under a sole-risk agreement (Brown, 1976).

The following is paraphrased from Baillie *et al* 1991. "Early exploration of the basin by Esso-BHP & subsequently by BHP alone (1965-82) concentrated on structures at the top of the Eastern View Group, similar to these in the Gippsland Basin where the largest accumulations are found at, or near the top of the stratigraphically equivalent Latrobe Group. Following this initial phase of exploration, which resulted only in the discovery of the sub-economic Pelican gas accumulation, exploration of the basin declined and was subsequently taken over by two groups led by Bass Strait Oil & Gas and Weaver Oil & Gas. The results of the initial exploration phase indicated that the upper Eastern View Group was largely thermally immature, that only limited vertical migration had occurred in the basin, and that the best potential for hydrocarbons occurs within deeper, thermally mature levels of the lower Eastern View Group (Nicholas *et al*, 1981; Davidson *et al*, 1984; Williamson *et al*, 1985; Williamson & Pigram, 1986).

The Bass Strait Oil & Gas group succeeded in attracting Amoco Production Company into the basin and four wells were drilled during 1985-1986. Bridge Oil Limited became operator of the other consortium which drilled two wells in the same period. This phase of drilling, in part designed to test deeper targets than the earlier Esso-BHP exploration, resulted in the Yolla 1 oil and gas discovery well, the dry wells Koorkah 1, Chat 1 and Seal 1, Tilana 1 and Pelican 5 which had gas shows".

In 1992 SAGASCO Resources drilled the King 1 well in T/18P attempting to get updip of Cormorant 1 which had good shows in the upper EVCM. All sands intersected by King 1 were water wet and the well was plugged and abandoned. In addition SAGASCO Resources drilled the Flinders 1 well in T/25P hoping to intersect hydrocarbons in the prospective *M.diversus* & Palaeocene units not penetrated by Pipipa 1. The well was plugged and abandoned after all reservoir quality sands intersected were observed to be water wet.

3.2 Seismic Surveys

Reconnaissance surveys were conducted in the T/25P region of the Bass Basin until 1970-72 when extensive regional and semi-regional grids were acquired. These grids were located after the Basin's structural grain had been established and hence are aligned in a NW-SE strike and NE-SW dip orientation. Several structures were identified and subsequently drilled on these grids, in particular the subeconomic Pelican field was discovered and in 1977 a detailed 1x1km grid was acquired over it.

In 1980 a 2x2km grid was acquired over the Pipipa high to raise it to drillable status.

In 1984-85 the new operator Amoco recorded a very extensive regional grid with a 1-4km dip line spacing and a 2-6km strike line spacing. Gravity and Magnetic readings were taken simultaneously during these surveys. Amoco followed this work up with an intensive reprocessing program of the earlier vintages which, in general produced significant improvements in data quality.

In 1990 the Basin Study Group was formed and subsequently reprocessed several line portions in the Pipipa-Hunter (formally Penguin) area. In 1992 SAGASCO Resources as the new T/25P operator proceeded with the Hunter Seismic Survey detailing the Pipipa, Pipipa North and Hunter highs. This grid was aligned in a WNW-NNE sense in order that counter regional faulting might be better resolved.

Also in 1992 SAGASCO Resources commenced interpretation on a Geoquest Workstation. No stack or migrations data prior to 1984 had been stored on SEG-Y tape. In order to facilitate the interpretation several 1980 lines in the Pipipa area were reprocessed and stored to tape. In addition the 1984 and 1985 data, which had been stored only as stack data, were migrated and stored on tape.

The seismic surveys which have been acquired in T/25P are listed in Table 3.1.

3.3 Geophysical Studies

In 1990 an amplitude versus offset study was conducted over the Flinders structure. HGS conducted the processing of line TNK4-79 using their AVOSCAN program. This program is based on the linear fitting of amplitudes versus angle of incidence (at each offset) to input NMO corrected CDP gathers. In addition, three horizons had their amplitudes tracked at several locations along the line. The resultant amplitudes were then plotted against offset.

In conclusion, it was found that there were no apparent AVO anomalies over the line segment studied. During the subsequent drilling of Flinders 1 a dolerite intrusive was encountered corresponding to the seismic amplitude anomaly studied.

Gravity and magnetic surveys were conducted over a wide area in 1960 and 1961 by Hematite Petroleum Pty Ltd. These data are presented in the report "Bass Strait & Encounter Bay aeromagnetic survey, 1960-1961 : BMR Australia, Petroleum Search Subsidy Acts : Publication Report 60". Gravity and magnetic readings were acquired during most early seismic surveys, however a large seismic survey in 1984 and 1985 by Amoco with simultaneous gravity and magnetics readings produced reasonably detailed maps over a significant portion of the Bass Basin. These maps are currently being digitised to enable better and reproducible presentation.

3.4 Drilling

Twenty-nine offshore exploration and appraisal wells (Table 3.2 and Figure 3.1) have been drilled in the Bass Basin since drilling commenced in 1965 with the Esso operated Bass 1. Nine of these wells are located within T/25P. Well Summary and Post Mortem Sheets for each well in T/25P are included in Appendix 1.

TABLE 3.1

SEISMIC ACQUIRED: PERMIT T/25P

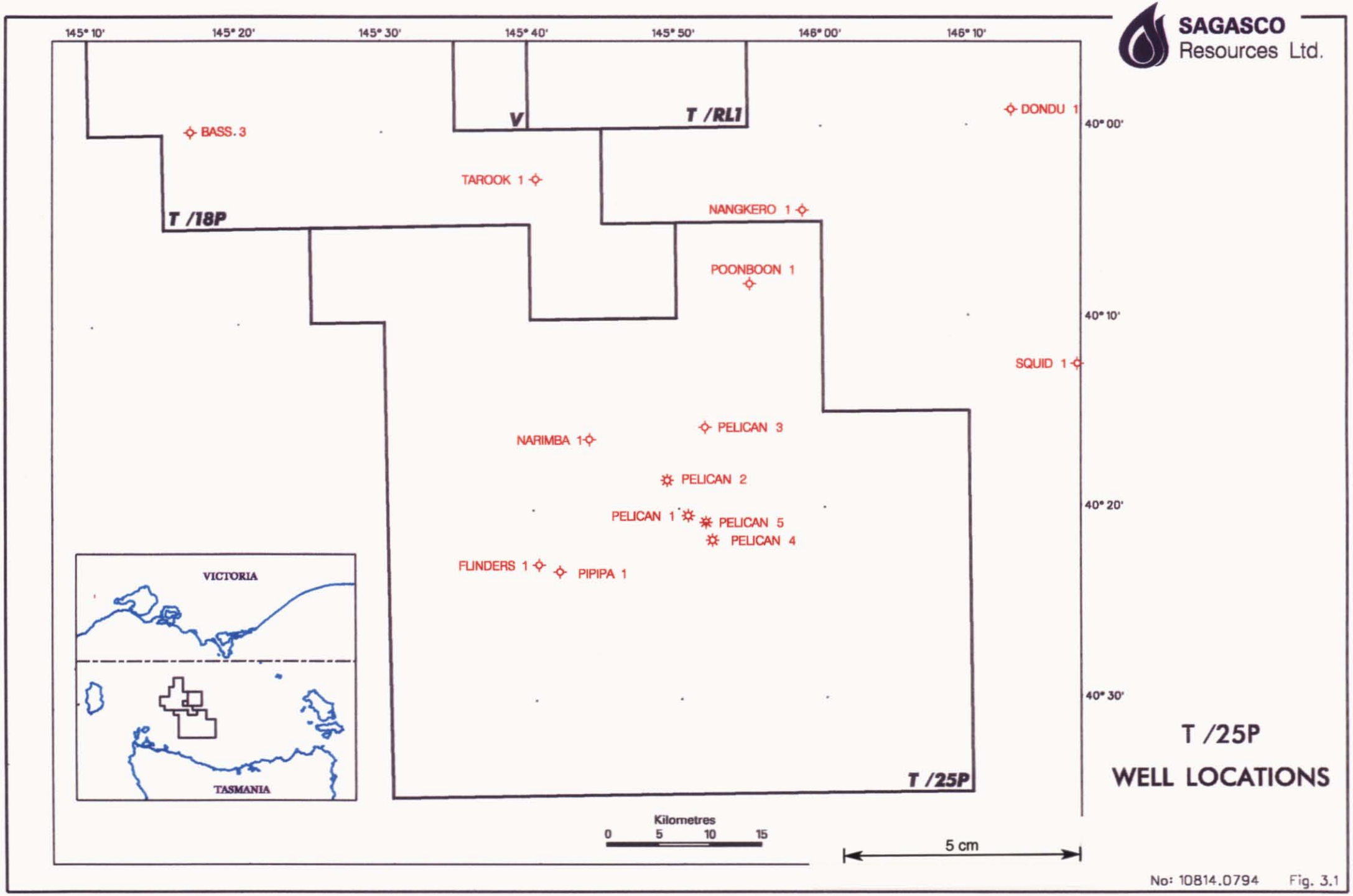
LINE PREFIXES	YEAR	OPERATOR	QUALITY
B	1965	Hematite	Poor
ES	1966	ESSO	Poor
EF	1968	ESSO	Poor
B70A	1970	ESSO	Poor
B71A	1971	ESSO	Poor
B72A	1972	ESSO	Poor
HB73A	1973	Hematite	Poor-Medium
HB75A	1975	Hematite	Medium
HB77A	1977	Hematite	Medium-Good
HB80A	1980	Hematite	Medium-Good
81BBS	1981	Bass Strait Oil & Gas	Medium-Good
81BCS	1981	Cue Minerals	Medium-Good
WB81	1981	Weaver	Medium-Good
WB82	1982	Weaver	Medium-Good
TNK4	1984	Amoco	Good
BB85	1985	Bridge	Good
TQH5	1985	Amoco	Good
S92A	1992	SAGASCO	Good
SB94A	1994	SAGASCO	Good

TABLE 3.2

WELLS DRILLED: PERMIT T/25P

YEAR	WELL NAME	OPERATOR	WELL TYPE	TARGET	TOTAL DEPTH (m) KB	STATUS	SHOWS
1970	Pelican 1	Esso	Expl	E. Eocene	3178.5	P&A	FITs recovered gas & condensate
1970	Pelican 2	Esso	Aprl	E. Eocene	3068.1	P&A	FITs recovered gas & condensate
1972	Pelican 3	Esso	Expl	E. Eocene	2906.9	P&A	-
1972	Poonboon 1	Esso	Expl	E. Eocene	3265.9	P&A	FITs recovered minor gas
1973	Narimba 1	Esso	Expl	E. Eocene	3353.7	P&A	FITs recovered minor gas
1979	Pelican 4	Hematite	Aprl	E. Eocene	3051.0	P&A	FITs recovered gas & condensate
1982	Pipipa 1	Hematite	Expl	E. Eocene	2115.0	P&A	Oil & Gas shows
1985	Pelican 5	Amoco	Aprl	E. Eocene/ Palaeocene	4267.0	P&A	5.6 MMCFD & 302-441 BCPD
1992	Flinders 1	SAGASCO	Expl	E.Eocene/ Palaeocene	2723.0	P&A	No shows

491034


SAGASCO
Resources Ltd.
145° 10'
145° 20'
145° 30'
145° 40'
145° 50'
146° 00'
146° 10'
40° 00'
40° 10'
40° 20'
40° 30'
V
T /RL1
T /18P
T /25P
BASS. 3
TAROOK 1
DONDU 1
NANGKERO 1
POONBOON 1
SQUID 1
NARIMBA 1
PELICAN 3
PELICAN 2
PELICAN 1
PELICAN 5
PELICAN 4
FLINDERS 1
PIPIPA 1
VICTORIA
TASMANIA
Kilometres
0 5 10 15
5 cm
T /25P
WELL LOCATIONS
No: 10814.0794 Fig. 3.1

The first well to be drilled in T/25P was Pelican 1, also operated by Esso, which resulted in the discovery of gas and condensate charged sandstone reservoirs sealed by intraformational shales within sediments belonging to the lower to middle *M.diversus* palynological zones (early Eocene) of the Eastern View Coal Measures (EVCM). Several of these sands were tested by FITs which recovered gas and condensate. Pelican 1 reached a total depth of 3179m (10,428 ft) in sediments belonging to the upper *L.balmei* palynological zone (late Palaeocene).

In 1972, three wells were drilled in T/25P by Esso. The first of these was Poonboon 1 a wildcat drilled on a large closure over a basement high. Log analysis indicated the presence of gas in a 6 ft (1.8m) sandstone of Palaeocene age. This zone was subsequently tested by two FITs which recovered 21000cc fresh water with 1.4 cubic feet gas, and 1.1 cubic feet of gas, respectively. Poonboon 1 reached a total depth of 3266m (10,715ft) in sediments belonging to the *T.longus* palynological zone (Late Cretaceous) and was plugged and abandoned.

Pelican 2 was an appraisal of the gas condensate discovery located on a separate fault block of the Pelican structure, 4 kilometres to the northwest of Pelican 1. The well also encountered significant gas and condensate bearing reservoirs belonging to the lower to middle *M.diversus* palynological zones of the early Eocene. FITs were run and the best test from the "E" sand resulted in a recovery of 37 cubic feet of gas, 750 cc of condensate and 13000 cc of mud. Pelican 2 was drilled to a total depth of 3068m (10,066 ft) in sediments belonging to the lower *M.diversus* palynological zone (early Eocene) and was plugged and abandoned.

Pelican 3 was drilled on the upthrown side of the major fault which forms the northeastern limit of the Pelican half graben, and is considered as a separate structural test independent of the main Pelican structure. As a result of its structurally high position the well encountered a condensed sequence of Eastern View Coal Measures. The lower to middle *M.diversus* palynological zone sequence was considerably thinner than that encountered in Pelican 1 and 2 and no shows were encountered at this stratigraphic level. However, towards the base of the well weak shows of gas were reported during drilling in sandstones belonging to the lower *L.balmei* palynological

zone. A series of FIT tests produced minor recoveries of gas at best. A decision was made to case Pelican 3 and an interval of lower *L.balmei* sands were tested through perforations. The test produced a flow of 168 BWPD with gas at a rate too small to measure. Pelican 3 reached a total depth of 2907m (9537 ft) in sediments belonging to the lower *L.balmei* palynological zone (early to middle Palaeocene).

In 1973, the wildcat Narimba 1 was drilled by Esso on a separate culmination structurally deeper, on trend with but to the northwest of the Pelican structure. The well was drilled to a total depth of 3353.7m (11,003 ft). Small gas shows were recorded in the lower and middle *M.diversus* palynological zones and subsequently tested by FIT. The tests recovered only small volumes of gas, probably representing solution gas and the well was consequently plugged and abandoned. Current mapping shows that Narimba 1 was drilled on a very small closure at the key reservoir levels, but the structure appears to have developed during the Oligocene/Miocene compressional event and hence probably post-dates hydrocarbon migration.

Five years elapsed between the drilling of Narimba 1 and the next well, Pelican 4, drilled by Hematite in 1979. Pelican 4 was drilled to appraise the southeastern limit of the Pelican structure and is located 3.5 kilometres to the southeast of Pelican 1. Gas shows were encountered in sandstones of the lower and middle *M.diversus* palynological zone. Several of these zones were tested and good gas and condensate recoveries were obtained from two zones at 2739.5m (8988 ft) and 2884.6m (9464 ft). The well was not tested further and was plugged and abandoned. The current mapping places Pelican 4 on a separate fault block to the Pelican Field. Remapping of this area will follow remigration of the seismic data over Pelican Field and this will confirm whether Pelican 4 constitutes a discovery of a separate gas field.

Pipipa 1 was drilled in 1982, also by Hematite, as the last permit commitment well after the interpretation of seismic data acquired over the prospect in 1980. The well was drilled to test a large closure at the top of the EVCM. Subsequent remapping has shown that Pipipa 1 is a valid structural test at this level. Good oil and gas shows were recorded towards the total depth of the well, but log analysis indicated no moveable hydrocarbons to be present. At a total depth of 2115m (6939 ft) the well was plugged and abandoned. It was not possible to date the sediments at total depth

due to the poor preservation of spores resulting from a localised high palaeo-heat flow event, due to a volcanic intrusion which elevated measured vitrinite reflectance values to as high as 2.3%. However, seismic ties to the Pelican Field suggest that total depth in Pipipa 1 was reached in sediments near to the top of the lower to middle *M.diversus* palynological zone. The prospective *M.diversus* reservoir sequence in T/25P was not penetrated by Pipipa 1.

A characteristic of the middle *M.diversus* zone in many of the wells drilled in T/25P is the presence of abnormally pressured shales. A shale pressure study was conducted which showed that no abnormally pressured shales are present in Pipipa 1, further suggesting that the *M.diversus* zone sediments were not reached.

The next well to be drilled in T/25P was Pelican 5, by Amoco, in 1986. The objectives of Pelican 5 were twofold, (i) to establish deliverability characteristics of the lower to middle *M.diversus* palynological zone (Pelican zone) reservoirs by testing through casing, and (ii) to evaluate the abnormally pressured zone beneath the top Palaeocene unconformity for reservoir development and fluid content.

Pelican 5 is located between Pelican 1 and 4, and encountered the EVCM at a comparable structural elevation. Gas and condensate shows were again encountered in sandstones of the lower and middle *M.diversus* zones, and shows continued with an increase in the concentration of heavier hydrocarbons with depth below the top Palaeocene to total depth in the Late Cretaceous at 4267m (14000 ft) still within abnormally pressured sediments. The well was cased and several of the most encouraging zones were tested through perforations. The results of the testing program were disappointing. A sand at the base of the lower *M.diversus* zone flowed gas at 0.75 MMCFD and recovered a trace of condensate, whilst a sand in the "E" zone of the middle *M.diversus* zone flowed gas at 5.6 MMCFD with 302-441 BCPD and 662-705 BWPD (the water is interpreted to originate from another sandstone via leakage behind casing). All other zones tested are interpreted to be tight. As no commercial flow rates were obtained, the well was plugged and abandoned.

Flinders 1 was drilled by SAGASCO Resources in 1992. The well had a two fold objective, to test top EVCM closure updip from Pipipa 1, located 2km ESE and to test the prospective *M.diversus* and Palaeocene levels not penetrated by Pipipa 1. A tantalising seismic anomaly was present at the middle *M.diversus* zone, but this was suspected to be a sill given the elevated vitrinite reflectance values observed in the deepest section intersected in Pipipa 1 (Section 10.8). The pre-drill Flinders middle *M.diversus* structure was totally fault dependent and relied on anti-regional faults to develop a significant closure.

The well intersected the top EVCM 22m downdip of Pipipa 1 and encountered no shows at that level. The seismic amplitude anomaly proved to be due to a 67m thick dolerite sill. No significant hydrocarbon shows were encountered in the primary targets and recent mapping following the 1992 Hunter Seismic Survey fails to close Flinders at any level below the upper *M.diversus*. Closure at the upper levels appears to be mechanical uplift caused by the emplacement of the Miocene aged intrusion. No tests were conducted and the well was subsequently plugged and abandoned.

4 STRATIGRAPHIC STUDIES - EASTERN VIEW COAL MEASURES

4.1 Objectives

The major objective of this stratigraphic study was to attempt to subdivide the Eastern View Coal Measures into a sequence of smaller informal units which would allow mapping, investigation of reservoir properties, and palaeogeography on a smaller stratigraphic scale than has been previously possible.

4.2 Method

The study area involved all wells in T/25P together with the following key wells from surrounding areas:

Nangkero 1
Dondu 1
Tilana 1
Yolla 1

A database was set up in Terrastation using wireline data, palynology data, and synthetic seismograms derived from LOGM software. Lithology data were also entered for the Demons Bluff Formation and Eastern View Coal Measures. The lithologies were determined by using gamma ray and sonic cutoffs obtained by inspection of mudlog and composite log data from each of the wells. Where lithology could not be accurately assigned using this technique, such as over intervals of intrusive and extrusive igneous rocks, or where high gamma sands occurred, the lithology was edited manually.

A section with top Demons Bluff Formation as datum was then constructed (Enclosure 1). Correlations were performed using wireline, palynology and seismic data. Detailed correlations were possible on closely spaced wells, such as between Pelican 1, 2, 4, 5 and Narimba 1, and between Flinders 1 and Pipipa 1. Other regionally spaced wells were less easy to correlate.

4.3 Stratigraphic Subdivision of the Eastern View Coal Measures

In T/25P six regionally correlatable units (see Enclosure 1, Table 4.1 and 4.2) were identified within the Eastern View Coal Measures as follows:

Unit 1	Top EVCM to base *N.asperus*
Unit 2	Base *N.asperus* to Base *P.asperopolus*
Unit 3	Base *P.asperopolus* to top middle *M.diversus*
Unit 4	Top middle *M.diversus* to top Palaeocene
Unit 5	Top Palaeocene to top Cretaceous
Unit 6	Top Cretaceous and below

Unit 1

The top of this unit (the top of the EVCM), is easily recognisable in all wells and is picked as the top of the highest sandstone in the EVCM. There is also a clear break in sonic response from the relatively low velocity sandstones of the EVCM to the faster velocity siltstones and shales of the overlying Demons Bluff Formation. Consequently the top of Unit 1 is characterised by a well developed trough on synthetic seismograms and seismic sections.

The base of this unit (the base of the *N.asperus* unit), is defined mainly by detailed wireline correlation, and is represented by the probably erosive base of a progradational sandstone.

Palynological data show this unit to be lower to middle *N.asperus* in age, although palynological control is shown to be imprecise given the good wireline correlation.

Unit 2

The base of Unit 2 is also characterised by the base of an erosive progradational sandstone. The wireline pick is also well supported by palynology data as being the boundary between the upper *M.diversus* and *P.asperopolus* zones.

Palynological data show the unit belongs predominantly to the *P.asperopolus* zone, but may include part of the earliest lower *N.asperus* zone.

Unit 3

The base of Unit 3 in the Pelican Trough is similar to the bases of Units 1 and 2 being the base of relatively thick progradational sandstone. Palynological control is good in the Pelican Field and at Narimba 1 but is poor elsewhere, and particularly poor at Flinders 1 where palynological control is affected by thermal alteration of the spores and pollen due to a thick igneous intrusion.

In the Yolla Trough the base of the unit is correlated with a coal marker, and with good palynological control.

Unit 3 is predominantly dated as belonging to the upper *M diversus* palynological zone.

Unit 4

The base of Unit 4 is defined by palynological data as poor well control results in insufficient data to establish a wireline correlation. The base therefore is identified as the boundary between the base of the lower *M.diversus* and the top of the upper *L.balmei* palynological zones.

Unit 4 therefore includes the lower and middle *M.diversus* palynological zones.

Unit 5

The base of unit 5 is also defined by palynological data being the boundary between the lower *L.balmei* and *T.longus* zones. Wireline correlation of this surface is not possible given the limited well control.

Unit 5 includes the lower and upper *L.balmei* zones and is entirely Palaeocene in age.

Unit 6

Unit 6 has been only partially penetrated at Pelican 5 and Poonboon 1 within T/25P. Sediments in these wells belong to the *T.longus* and *T.lillie* palynological zones. The base of Unit 6 has not been defined in T/25P.

MRC9407005

TABLE 4.1

FORMATION TOPS (mKB)

	KB	DEMONS BLUFF	EVCM	Base *N.asperus*	Base *P.asperopolus*	Middle *M.diversus*	Palaeocene	Cretaceous	TD
Flinders 1	22.3	1432.00	1546.05	1767.67	1977.64	2137.54	2458.97	NP	2723
Pipipa 1	21.0	1410.66	1522.65	1773.30	1966.38	NP	NP	NP	2115
Pelican 4	25.0	1638.30	1747.73	2006.71	2264.65	2440.44	2978.34	NP	3051
Pelican 5	22.3	1634.71	1746.06	1995.84	2266.83	2447.90	3107.87	3508.51	4267.2
Pelican 1	30.48	1635.86	1755.34	2009.22	2272.51	2447.84	3149.04	NP	3178.45
Pelican 2	30.48	1674.26	1793.75	2054.57	2339.82	2514.17	NP	NP	3068.1
Narimba 1	9.754	1652.17	1793.76	2044.58	2333.34	2538.17	3415.30	NP	3353.71
Pelican 3	9.754	1666.25	1788.25	2045.93	2157.81	2288.74	2416.55	NP	2906.9
Poonboon 1	9.754	1754.11	1891.66	2167.65	2302.45	2385.05	2662.98	3241.82	3265.9
Nangkero 1	9.754	1752.35	1880.92	2150.63	2256.49	2380.57	2732.84	NP	2884
Dondu 1	9.754	1518.05	1621.93	1890.47	NR	2080.20	2360.37	2853.21	2927
Tilana 1	22.3	1527.97	1639.06	1967.67	NR	2466.04	2779.39	3587.6	3900
Yolla 1	11.1	1671.33	1807.35	2142.43	NR	2467.35	2808.99	NP	3347

Notes:

NR pick not recognisable
NP not penetrated

MRC9407005

TABLE 4.2

THICKNESS (M) EASTERN VIEW COAL MEASURES

	UNIT 1	UNIT 2	UNIT 3	UNIT 4	UNIT 5
Flinders 1	221.62	209.97	> 159.90	321.43	> 264.03
Pipipa 1	250.65	223.08	148.62	NP	NP
Pelican 4	258.98	257.94	175.79	537.90	> 72.66
Pelican 5	249.78	270.99	181.07	659.97	400.64
Pelican 1	253.88	263.29	175.33	701.20	> 29.41
Pelican 2	260.82	285.25	174.35	> 553.93	NP
Narimba 1	250.82	288.76	204.83	> 815.5	NP
Pelican 3	257.67	111.88	130.94	127.81	> 490.35
Poonboon 1	275.98	134.80	82.61	277.93	> 578.84
Nangkero 1	269.71	105.86	124.08	352.27	> 151.16
Dondu 1	268.55	189.73*	-	280.17	> 492.84
Tilana 1	328.61	498.37*	-	313.35	> 808.21
Yolla 1	335.08	324.92*	-	> 341.64	NP

Notes: NP interval not penetrated or not completely penetrated.
* Units 2 an 3 combined

5 SEISMIC MAPPING

5.1 Introduction

The objectives of the seismic interpretation was to produce regional structural maps and hence to identify leads in T/25P that fulfilled the Joint Venture's criteria for economic viability. Identified leads would be detailed during a subsequent 250km seismic program.

A benefit of the interpretation project would be to provide an extensive regional map suite covering most of T/25P. This would be beneficial in the development of play concepts, maturation models etc.

5.2 Interpretation Method

For the purpose of interpretation a Sun Sparc 2 Workstation loaded with Geoquest software was utilised. The interpretation proceeded southwards from an extensive interpretation completed by the Operator in T/18P, although some of this previous interpretation was reworked after the extra data from T/25P had been added.

This flow on from a previous interpretation allowed the key markers identified to be immediately utilised. As all the wells except Pelican 3 had sonic and density logs and checkshot surveys, synthetics were generated on LOGM software and picks were checked manually on paper sections. For Pelican 3 a regional time depth curve was used to transfer tops to the seismic. SAGASCO Resources purchased the Geoquest SYNVIEW (synthetic seismogram) software late in the project, which allowed picks to be reconfirmed. The only useful lithological markers were the top and base of the Demon's Bluff, and all other correlation is based on palynological picks (in particular based on a report by Roger Morgan, 1985).

As previously mentioned a large reprocessing project provided migrations for most of the 1984 and 1985 lines and also the 1980 Pipipa grid (lines overshot by 1992 lines were not reprocessed). Lines only available as stacks were the 1985 lines in the southeast of the permit and the 1977 grid over the Pelican Field. Together with the

1992 Hunter Seismic Survey this provided a dataset of some 3500km of seismic (Table 5.1). A significant amount of pre 1977 data is yet to be loaded into Geoquest but a current reprocessing project is addressing this. Data were loaded as normal polarity and interpreted using a variable intensity colour display.

5.3 Data Quality

Each dataset has slightly different phase characteristics which although minor enough to be ignored for this regional style of interpretation could be addressed for future more detailed studies.

The grid spacing varies from 1km around Pelican Field to over 4km on the peripherals, however it generally averages 2x4km. The wide spacing of good quality (recent vintage) seismic lines in the strike orientation caused considerable problems during the interpretation making correlation extremely difficult in this highly faulted area.

The combination of a very coaly *M.diversus* section and the high frequency of faults deteriorates the data quality in T/25P, often making correlations ambiguous. Data quality below the *M.diversus* level is poor and subsequently Cretaceous reflectors have not been mapped. Basement produces a reasonable reflector in the southwest ramp province and is vaguely discernible in the Pelican Trough. On the Poonboon Plateau high amplitude, presumably Early Cretaceous reflectors make basement an ambiguous pick.

Igneous activity has corrupted significant areas of data, particularly on the Southwest Ramp. These Oligocene or Miocene extrusives coincide with the basin edge and make it difficult to map structure along this margin due to the data distortion below them. This scenario is also repeated in an area north of the Flinders 1 well. Isolated volcanoes of Oligocene or Miocene age occur elsewhere. In addition to the extrusives, several sills are observed, notably at Flinders and Hunter. The emplacement of these bodies has "popped-up" the section above them, wedging into the country rock rather than assimilating with it. Data quality below the sills is poor.

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TABLE 5.1

SEISMIC DATA USED (154 LINES)

Line Name	Remarks	Year Processed	Year Reprocessed	Utilised Shotpoint Range on Basemap	Shotpoint Range Relative to CDPs	CDP Range on Tape
HB77A-331	Stack	1977	1985	1-346	1-346	107-892
HB77A-332	Stack	1977	1985	1-376	1-376	107-952
HB77A-333	Stack	1977	1985	1-283	1-283	107-766
HB77A-334	Stack	1977	1985	1-513	16-513	136-1226
HB77A-335	Stack	1977	1985	1-505	1-505	107-1210
HB77A-336	Stack	1977	1985	1-513	1-513	107-1226
HB77A-337	Stack	1977	1985	1-587	1-587	107-1374
HB77A-339	Stack	1977	1985	1-664	1-664	107-1528
HB77A-340	Stack	1977	1985	1-513	1-513	107-1226
HB77A-341	Stack	1977	1985	1-561	1-561	107-1322
HB77A-342	Stack	1977	1985	1-708	1-708	107-1616
HB77A-343	Stack	1977	1985	1-605	1-605	107-1410
HB77A-344	Stack	1977	1985	1-432	1-432	107-1064
HB77A-345	Stack	1977	1985	1-628	1-628	107-1456
HB77A-346	Stack	1977	1985	1-560	1-560	107-1320
HB77A-347	Stack	1977	1985	1-497	1-497	107-1194
HB77A-348	Stack	1977	1985	1-428	1-428	117-1056
HB77A-349	Stack	1977	1985	1-543	6-543	117-1286
HB77A-350	Stack	1977	1985	1-529	1-529	107-1258
HB77A-351	Stack	1977	1985	1-462	1-462	107-1124
HB77A-352	Stack	1977	1985	1-388	1-388	107-976
HB77A-354	Stack	1977	1985	1-381	12-381	128-962
HB77A-356	Stack	1977	1985	1-302	1-302	107-804
HB77A-358	Stack	1977	1985	1-300	4-300	112-800
HB80A-411	Migration	1980	1992	101-495	48.5-491	2097-2982
HB80A-413	Migration	1980	1992	47-413	59-475.5	2118-2951
HB80A-415	Migration	1980	1992	101-460	48.5-460	2097-2920

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Line Name	Remarks	Year Processed	Year Reprocessed	Utilised Shotpoint Range on Basemap	Shotpoint Range Relative to CDPs	CDP Range on Tape
HB80A-417	Migration	1980	1992	47-421	58-473.5	2116-2947
HB80A-419	Migration	1980	1992	101-477	48.5-472	2097-2944
HB80A-421	Migration	1980	1992	47-379	75-431.5	2150-2863
HB80A-436	Migration	1980	1992	46-523	105-575.5	2210-3151
TNK4-26	Migration	1984	1992	40-1157	1-1291	1001-3700
TNK4-26A	Stack	1984	-	3500-3940	3971-2934	2987-5061
TNK4-32	Migration	1984	1992	1-1393	1-1393	1001-3984
TNK4-36	Migration	1984	1992	1-953	1-953	1001-3022
TNK4-38	Stack	1984	-	1-350	1-543	273-1472
TNK4-42	Migration	1984	1992	1-1615	1-1615	1001-4346
TNK4-44A	Migration	1984	1992	1-941	1-941	1001-2997
TNK4-46	Migration	1984	1992	1-1052	1-1052	101-3220
TNK4-48	Migration	1984	1992	1-2176	1-2176	1001-5468
TNK4-50	Migration	1984	1991	1-703	1-703	1004-2524
TNK4-51	Stack	1984	-	1600-1975	1-1975	273-4335
TNK4-52	Migration	1980	1991	1-383	1-383	1001-1880
TNK4-53	Stack	1984	-	1-516	1-516	273-1434
TNK4-54	Stack	1984	-	1-866	1-866	273-2134
TNK4-55	Stack	1984	-	1-600	1-774	339-7663
TNK4-59	Stack	1984	-	1-800	1-2053	273-4494
TNK4-61	Migration	1984	-	1-503	1-503	1001-2122
TNK4-65	Migration	1984	-	1-874	1-874	1001-2864
TNK4-67	Migration	1984	-	1-903	1-903	1001-2922
TNK4-69A	Migration	1984	-	1-884	1-884	1001-2886
TNK4-71	Migration	1984	-	1-822	1-822	1001-2760
TNK4-73	Migration	1984	-	1-814	1-814	1001-2744
TNK4-75	Migration	1984	1992	40-1423	1-423	1001-3962
TNK4-77A	Migration	1984	1992	1-1123	1-1123	1001-3362
TNK4-79	Migration	1984	1992	1-1125	1-1125	1001-3366
TNK4-81	Migration	1984	1992	1-1063	1-1063	1001-3242
TNK4-83	Migration	1984	1992	1-1074	1-1074	1001-3264

Line Name	Remarks	Year Processed	Year Reprocessed	Utilised Shotpoint Range on Basemap	Shotpoint Range Relative to CDPs	CDP Range on Tape
TNK4-85	(Part Line Migration)	1984	1991	1-600	1-600	1001-2318
TNK4-87	Migration	1984	1992	1-863	1-1863	1001-2842
TNK4-89	Migration	1984	1992	1-1285	1-1285	1001-3686
TNK4-91	Migration	1984	1992	1-954	1-954	1001-3024
TNK4-93	Migration	1984	1992	1-573	1-573	1001-2262
TNK4-95	Migration	1984	1992	1-933	1-933	1001-2982
TNK4-97	Migration	1984	1992	1-562	1-562	1001-2240
TNK4-99	Migration	1984	1992	1-933	1-933	1001-2982
TNK4-101	Migration	1984	1992	1-633	1-633	1001-2384
TNK4-103	Migration	1984	1992	1-662	1-662	1001-2442
TQH5-34	Migration	1985	-	400-794	1-794	1001-2706
TQH5-38	Stack	1985	-	1-500	1-943	1001-3004
TQH5-40	Migration	1985	-	200-1135	1-1154	1001-3426
TQH5-41	Stack	1985	-	1900-2553	1-2553	1001-6224
TQH5-43	Stack	1985	-	1-800	1-2087	1001-5292
TQH5-44	Migration	1985	-	1-1200	1-3144	1001-7406
TQH5-45	Migration	1985	-	1-923	1-923	1001-2964
TQH5-45-1	Migration	1985	-	1-900	1-1260	1001-3638
TQH5-46	Stack	1985	-	2-700	2-1816	1001-4778
TQH5-47	Migration	1985	-	1-763	1-763	1001-2644
TQH5-50	Migration	1985	1992	1-265	1-1265	1001-3648
TQH5-51	Migration	1985	1992	1-948	1-948	1001-3014
TQH5-51-1	Migration	1985	1992	1-300	1-785	1001-2688
TQH5-52	Stack	1985	-	800-1303	2-1303	1001-3722
TQH5-54-1	Migration	1985	-	300-1726	1-1726	1001-4570
TQH5-55	Migration	1985	-	1-1033	1-1033	1001-3184
TQH5-56	Migration	1985	-	2100-2447	1-2447	1001-6012
TQH5-56-1A	Migration	1985	-	1-1506	1-1506	1001-4130
TQH5-57	Migration	1985	-	1-1229	1-1229	1001-3576
TQH5-57-1	Migration	1985	-	1200-1517	1-1517	1001-4152

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Line Name	Remarks	Year Processed	Year Reprocessed	Utilised Shotpoint Range on Basemap	Shotpoint Range Relative to CDPs	CDP Range on Tape
TQH5-59	Migration	1985	-	5-1924	1-1924	1001-4966
TQH5-59-1	Migration	1985	-	1200-1633	1-1633	1001-4384
TQH5-60	Stack	1985	-	1-1026	1-1026	1001-3170
TQH5-60-1	Migration	1985	-	1-1373	1-1373	1001-3864
TQH5-61	Migration	1985	-	5-1419	1-1419	1001-3956
TQH5-63	Migration	1985	-	1-1813	1-1813	1001-4744
TQH5-64	Migration	1985	-	1-672	1-672	1001-2462
TQH5-66-1	Migration	1985	-	1-1750	1-2412	1001-5942
TQH5-72A	Stack	1985	-	1-450	25-962	1001-2994
TQH5-74	Stack	1985	-	460-1152	1-1152	1001-3422
TQH5-76	Stack	1985	-	465-1303	1-1303	1001-3724
TQH5-80	Stack	1985	-	215-1033	1-1033	1001-3184
TQH5-84	Migration	1985	-	1-862	1-862	1001-2842
TQH5-86	Migration	1985	-	1-1213	1-1213	1001-3544
TQH5-88	Migration	1985	-	1-792	1-792	1001-2702
TQH5-97	Migration	1985	1992	1-841	1-841	1001-2800
TQH5-98	Migration	1985	-	1-698	1-698	1001-2514
TQH5-99	Migration	1985	1992	1-841	1-841	1001-2800
TQH5-100	Migration	1985	1992	1-836	1-1836	1001-2790
TQH5-101	Migration	1985	1992	516-1363	1363-516	3844-2150
TQH5-102	Migration	1985	-	1-1744	1-1744	1001-4606
TQH5-117	Stack	1985	-	1-902	1-902	1001-2922
TQH5-119	Stack	1985	-	1-902	1-902	1001-2922
TQH5-121	Stack	1985	-	1-873	1-873	1001-2864
TQH5-123	Stack	1985	-	1-873	1-873	1001-2864
TQH5-125	Stack	1985	-	1-862	1-862	1001-2842
TQH5-137A	Migration	1985	1992	1-853	1-853	1001-2824
TQH5-139	Migration	1985	1992	1-932	1-932	1001-2982
TQH5-141A	Migration	1985	1992	20-872	1-872	1001-2862
TQH5-143	Migration	1985	1992	1-843	1-843	1001-2804
TQH5-145	Migration	1985	1992	1-884	1-884	1001-2886

Line Name	Remarks	Year Processed	Year Reprocessed	Utilised Shotpoint Range on Basemap	Shotpoint Range Relative to CDPs	CDP Range on Tape
TQH5-147	Migration	1985	1992	1-802	1-803	1001-2724
TQH5-161	Migration	1985	1992	1-832	1-833	1001-2782
TQH5-163A	Migration	1985	1992	1-935	1-939	1001-2996
TQH5-165	Migration	1985	1992	1-859	1-859	1001-2836
S92A-101	Migration	1992	-	180-611	101-611	1-1140
S92A-102	Migration	1992	-	101-1097	101-1097	1-2112
S92A-103	Migration	1992	-	41-541	541-41	1-1120
S92A-104	Migration	1992	-	41-1222	1222-41	1-2482
S92A-105	Migration	1992	-	101-536	101-536	1-990
S92A-106	Migration	1992	-	101-1281	101-1281	1-2480
S92A-107	Migration	1992	-	101-613	101-613	1-1144
S92A-108	Migration	1992	-	101-1659	101-1659	1-3236
S92A-109	Migration	1992	-	41-477	477-41	1-992
S92A-110	Migration	1992	-	101-906	101-906	1-1730
S92A-111	Migration	1992	-	101-650	101-650	1-1218
S92A-112	Migration	1992	-	41-546	546-41	1-1132
S92A-113	Migration	1992	-	41-514	514-41	1-1066
S92A-114	Migration	1992	-	41-1448	1448-41	1-2934
S92A-115	Migration	1992	-	101-640	101-640	1-1198
S92A-116	Migration	1992	-	41-551	551-41	1-1140
S92A-117	Migration	1992	-	41-777	777-41	1-1592
S92A-118	Migration	1992	-	41-552	552-41	1-1142
S92A-119	Migration	1992	-	101-985	101-985	1-1888
S92A-120	Migration	1992	-	101-611	101-611	1-1140
S92A-121	Migration	1992	-	41-924	924-41	1-1886
S92A-122	Migration	1992	-	101-612	101-612	1-1142
S92A-123	Migration	1992	-	101-800	101-800	1-1518
S92A-125	Migration	1992	-	41-701	701-41	1-1440
S92A-127	Migration	1992	-	101-726	101-726	1-1370
S92A-129	Migration	1992	-	41-516	515-41	1-1070
S92A-131	Migration	1992	-	101-575	101-575	1-1068

Line Name	Remarks	Year Processed	Year Reprocessed	Utilised Shotpoint Range on Basemap	Shotpoint Range Relative to CDPs	CDP Range on Tape
S92A-133	Migration	1992	-	41-514	514-41	1-1066
S92A-135	Migration	1992	-	101-576	101-576	1-1070
S92A-137	Migration	1992	-	41-515	515-41	1-1068
S92A-139	Migration	1992	-	101-575	101-575	1-1068

5.4 Misties

Each dataset was internally very consistent with misties generally well below 10ms. Phase and processing differences between each vintage did result in bulk shifts between them up to nearly 20ms. Adjusting for these bulk shifts improved the misties to below 10ms for the shallow horizons. For horizons within and below the *M.diversus*, faulting caused misties, particularly where strike and dip lines intersected coincident with a fault plane. Gridding and contouring compensates for these errors in a reasonably tidy fashion.

5.5 Mapping Method

Geoquest horizons were transferred to the Sattlegger mapping and contouring package where mistie analysis occurred and corrections computed and applied. The Geoquest MAPVIEW software was utilised to create maps of the fault contacts, which enabled fault cuts to be traced. The fault maps were made in order of structural maturity, ie from oldest to youngest, with each successive younger horizon overlain on its predecessor to achieve fault plane consistency. These maps were then digitised and transferred to Sattlegger where after minor editing, gridding and contouring of the time structure maps was done.

For the shallow, relatively unfaulted horizons isochron maps were generated using simple grid subtraction. Subtraction of grids for severely faulted horizons resulted in a most unsatisfactory result. Because of our need to identify regional trends, horizons were gridded again without faults and these unfaulted grids could be easily subtracted to give a better result for the isochron maps. Sparsity of useable data meant that the only basement map that could be generated was a severely smoothed "form" map.

Maps have been plotted in colour on SAGASCO Resource's Calcomp and Hewlett Packard HP650C DesignJet plotters. Some maps were transferred to Microstation and Harvard Graphics for final drafting.

5.6 Horizons Mapped

Horizons were interpreted on the basis that they, firstly, were directly useable for creating a structure map at expected prospective reservoir levels, or secondly, could be used to study the thickness variations of the prospective zones and possible sealing units, or finally could be used to study the basins late history as an adjunct to basin maturity studies and migration models.

The following horizons were selected for this purpose:

1 Late Miocene Reflector
2 Early Miocene Reflector (close to the Miocene/Oligocene unconformity)
3 Late Oligocene Reflector (just below the Miocene/Oligocene unconformity)
4 Top Demon's Bluff
5 Top EVCM
6 Top Upper *M.diversus*
7 Base Upper *M.diversus*
8 Top Middle *M.diversus*
9 Base Middle *M.diversus*
10 Top Lower *M.diversus*
11 Base Lower *M.diversus*
12 Top Palaeocene
13 Basement

NB: These picks are not strictly the top or base of these particular palynological zones. They are regional horizon picks which fall nearby to the zones and have been labelled this way for convenience.

6 STRUCTURAL ANALYSIS

Much of the tectonic history of the Bass Basin has been described in the "Regional Geology" section. Therefore the following are specific observations from the recent mapping in T/25P.

6.1 Basement

Figure 6.1 (Enclosure 2) "Basement, Smoothed Time Structure Map (ms TWT)"

The smoothed basement map only provides an approximation to this dramatically structured horizon. The mapped horizon varies from shallow times of 300ms beyond the EVCM edge to over 4900ms in the depths of the Pelican Trough. This could mean dips approaching 15° for this horizon on the Southwest ramp. The Pelican Trough splits the T/25P Block in two, separating the Southwest Ramp and Poonboon Platform structural provinces. The Trough is deepest adjacent to the Clarke prospect and north of Narimba 1 and also a deep trough is apparent to the southeast. The later trough is significant as this southeastern area had often been labelled as being too distant from mature source. This could clearly be quite wrong and this area should be more fully evaluated. An interesting feature of the map is that it might show a basement high centred northeast of Pelican 3 giving credence to the existence of a large simple anticlinal dome south of Poonboon and named Veridian at shallower levels. A small Cretaceous trough may exist further to the northeast giving another opportunity for a source basin in this area. Further work is necessary to formalise these ideas.

In the Tarook area basement is an ambiguous pick as Early Cretaceous reflectors, quite high in amplitude, are prevalent. The contouring probably reflects a mispick, however there is a possible transfer zone there orientated NE-SW. Further evidence for this would be the intrusives at Tarook, Raoul and Clarke, the displacement of the axes of the Pelican and Yolla Troughs; and the notable uplifted appearance of Clarke. More seismic data, particularly strike lines, are necessary before transfer faults could be confidently interpreted.

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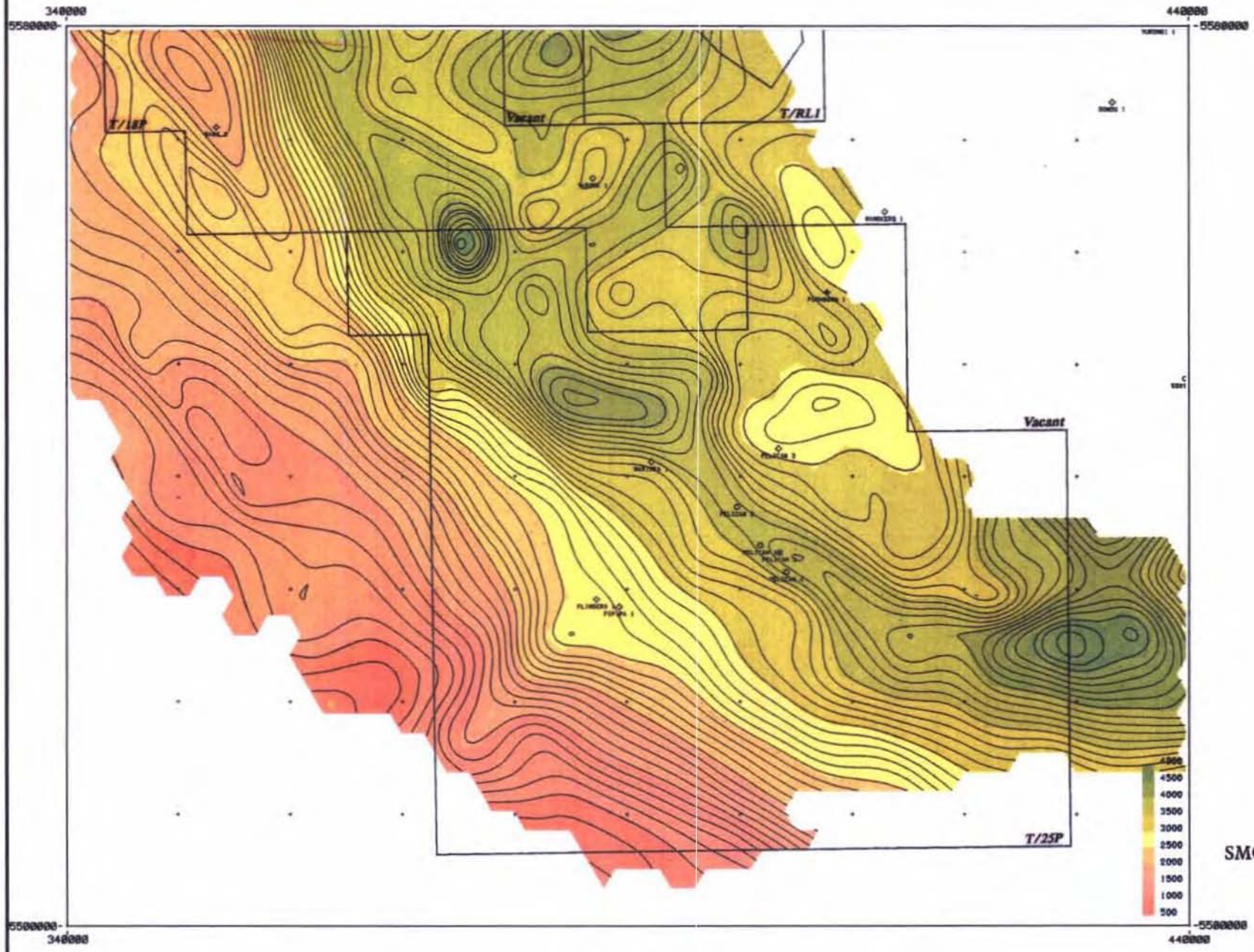

N

0 15km.

Scale 1: 500000

BASS BASIN T/25P

BASEMENT

SMOOTHED TIME STRUCTURE MAP

ms TWT

5 cm

FIG. 6.1 Dwg No. 10739

6.2 Top Palaeocene

Figure 6.2 (Enclosure 3) "Top Palaeocene, Time Structure Map (ms TWT)"
(Refer to Figure 11.1 for names of Leads and Prospects)

Two major regional deeps are present on the Palaeocene Map corresponding to the Pelican and Yolla Troughs. The NW-SE fault orientation is clearly pervasive but from Poonboon southward a zone of N-S faulting is apparent, but poorly sampled by seismic. This faulting corresponds to N-S Zone 3 observed by Smit, 1988 and described as a "north-south transfer fault with a wrench component" aged Early Cretaceous. Further seismic and specific study would be necessary to confirm this interpretation of the observed faulting. In T/25P the Pelican Trough has been set up by large longitudinal NW-SE basement involved synthetic faults and their generally non-basement involved antithetic conjugates. Structural complexity occurs with structural development because major antithetic faults have their own minor antithetic faulting and so on. Additionally, relay ramps have developed and are present in various stages of structural maturity. Mature "Stage 4" relay ramps (see Figure 6.3 after Peacock & Sanderson, 1994) with associated cross-ramp faultings are observed on the Palaeocene map and these contribute to trapping geometrics in several areas (eg Peron Lead).

TABLE 6.1

MAJOR BASEMENT INVOLVED FAULTS IN T/25P

Synthetic	Antithetic Conjugates
Warrego Fault Tourville Fault Clarke Fault	Eddystone Fault, Grindstone Fault

Normal faulting is the major mechanism and fault planes are only slightly curved with depth.

491058

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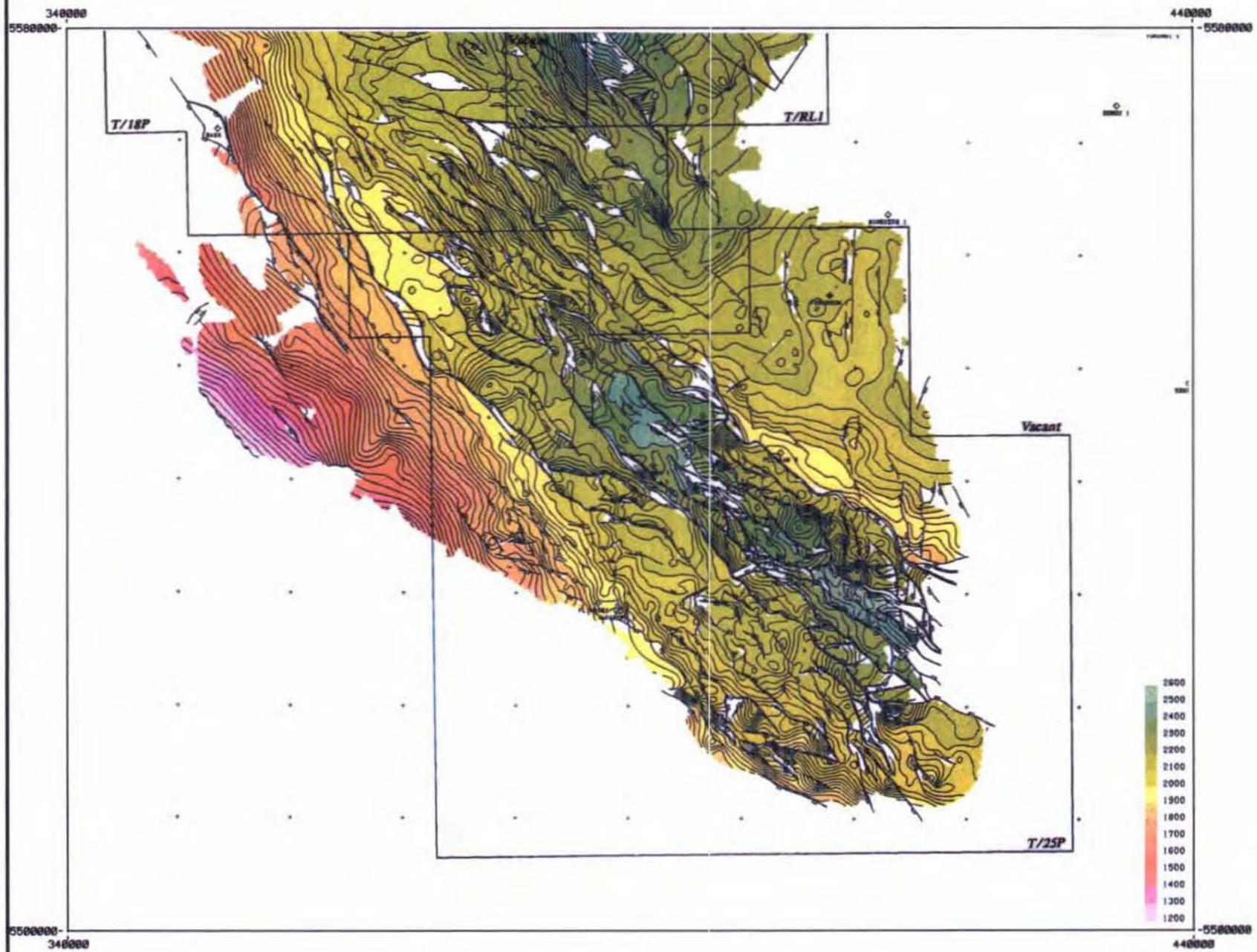


N

0 15km.

Scale 1: 500000

BASS BASIN T/25P

TOP PALAEOCENE

TIME STRUCTURE MAP

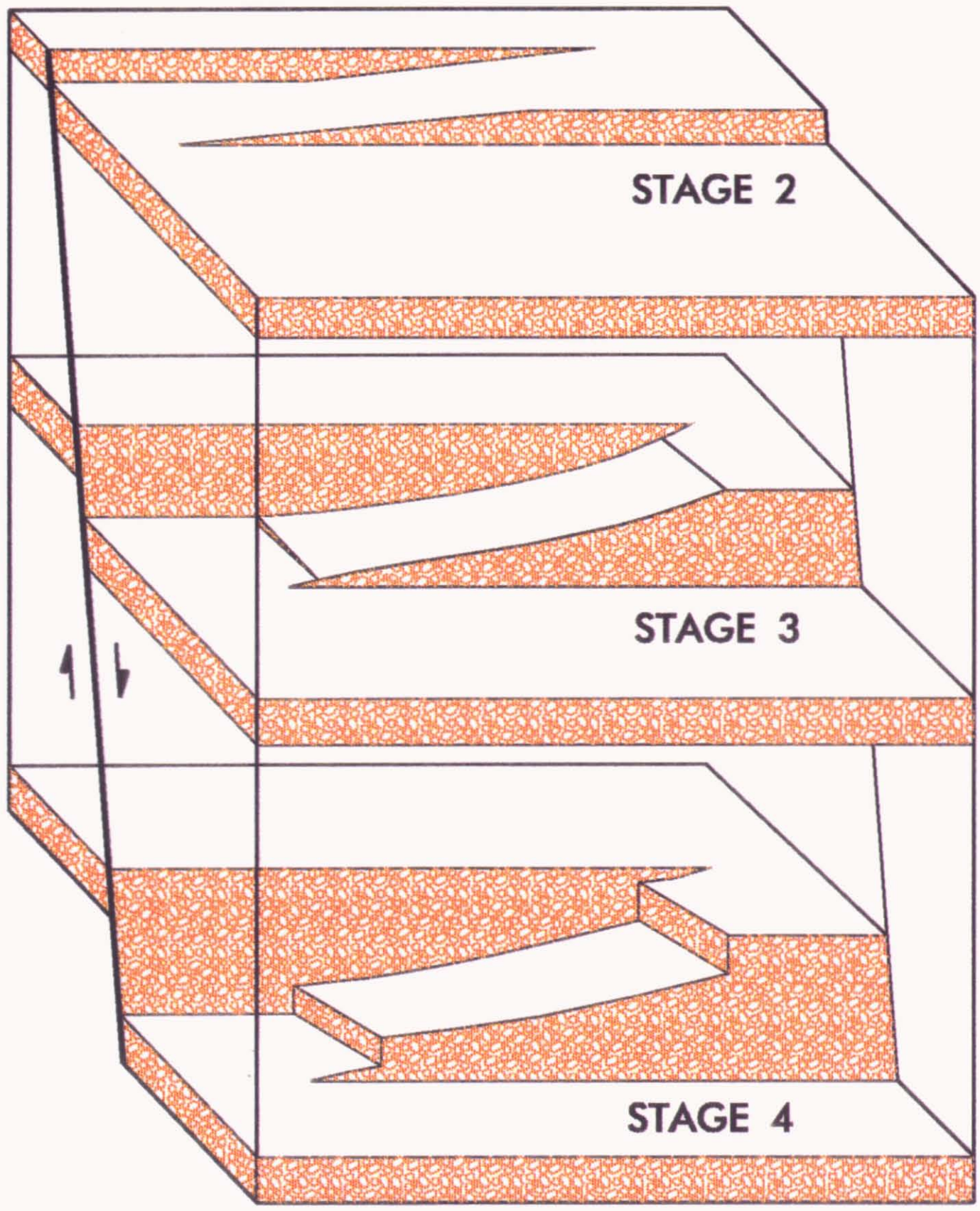
ms TWT

5 cm

FIG. 6.2 Dwg No. 10745

491059

SAGASCO Resources Ltd.



Block diagram of the possible spatial distribution of relay ramps. Different levels have different displacements and different stages of relay evolution, with a spatial development occuring from stage 4 at the branch line to stages 3 and 2 up or down the dip of the fault. It is possible that such faults pass vertically into stage 1 relays, i.e., apparently isolated, noninteracting segments.

POSSIBLE SPATIAL DISTRIBUTION OF RELAY RAMPS

(after Peacock & Sanderson, 1994)

No. 10835.0794 FIG. 6.3

Trapping geometrics in the Palaeocene are set up by reactivated Cretaceous faults. This reactivation occurred mostly during the *M.diversus* deposition where faults accommodated sediments by growth. Miocene deformations have enhanced several of the structures. In addition drape over a Cretaceous high was the mechanism for generating the Veridian culmination. As mentioned in the "Regional Geology" section the Palaeocene is believed to be structurally quiescent. As a result its deposition occurred uniformally over a widespread area, although thickening into the Cretaceous depocentres and thinning onto the Cretaceous highs occurs. This is not quantified in this report as a Late Cretaceous reflector which could be used for isochrons was not mapped.

Mapped Palaeocene varies from 1200ms to 2600ms deep on the seismic data. Poor data quality prevents mapping the Palaeocene southwest of the Flinders-Hunter trend. Lack of migrated data and a wide seismic grid prevents a significant amount of the eastern portion of T/25P from being interpreted confidently.

6.3 Lower *M.diversus*

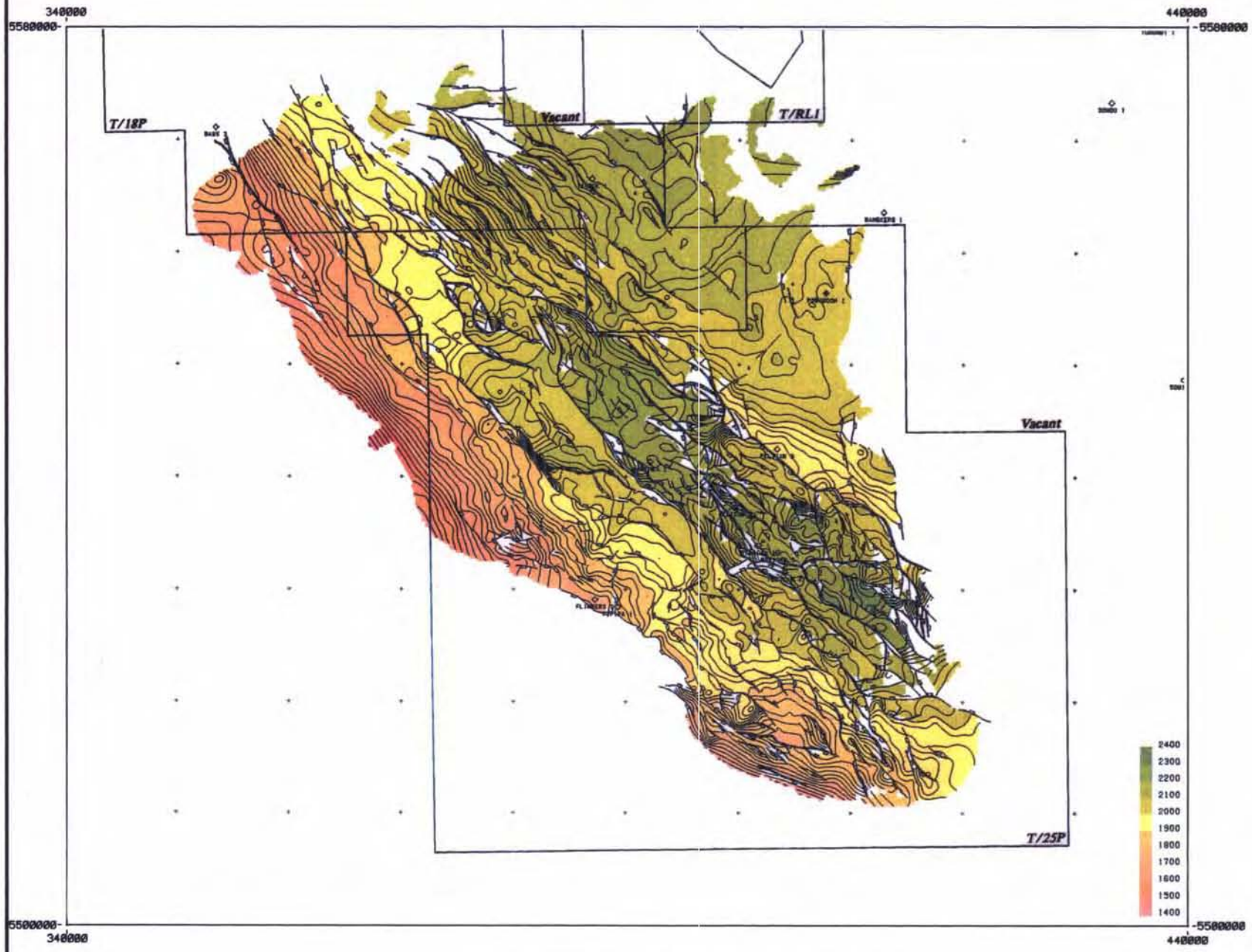
Figure 6.4 (Enclosure 4) "Top Lower *M.diversus*, Time Structure Map (ms TWT)"
Figure 6.5 (Enclosure 5) "Isochron of Lower *M.diversus*"

The lower *M.diversus* maps characteristics are very similar to the Palaeocene, but naturally relief decreases with reduced structural maturity. Prominent structures seen on the Palaeocene map persist on this horizon. The lower *M.diversus* has been mapped over a similar area to the Palaeocene and varies from 1400 to 2400ms deep on the seismic data.

Several interesting observations can be made on the isochron thickness of the lower *M.diversus*. Firstly the prominence of the Pelican Trough deposition of this unit is quite marked. Interestingly thinning occurs over the Pelican Field indicating that the structure has been quite long-lived. The fact that this thinning also occurs over the Hilliard, Tourville and Actaeon terraces (Figure 11.1) may have enhanced the prospectivity of these structures if early structuring is determined to be important for hydrocarbon trapping. The isochron map also shows that the Bass 3 and Poonboon 1

491061

SAGASCO Resources Ltd.



N

0 15km.

Scale 1: 500000

BASS BASIN T/25P

TOP LOWER M.DIVERSUS

TIME STRUCTURE MAP

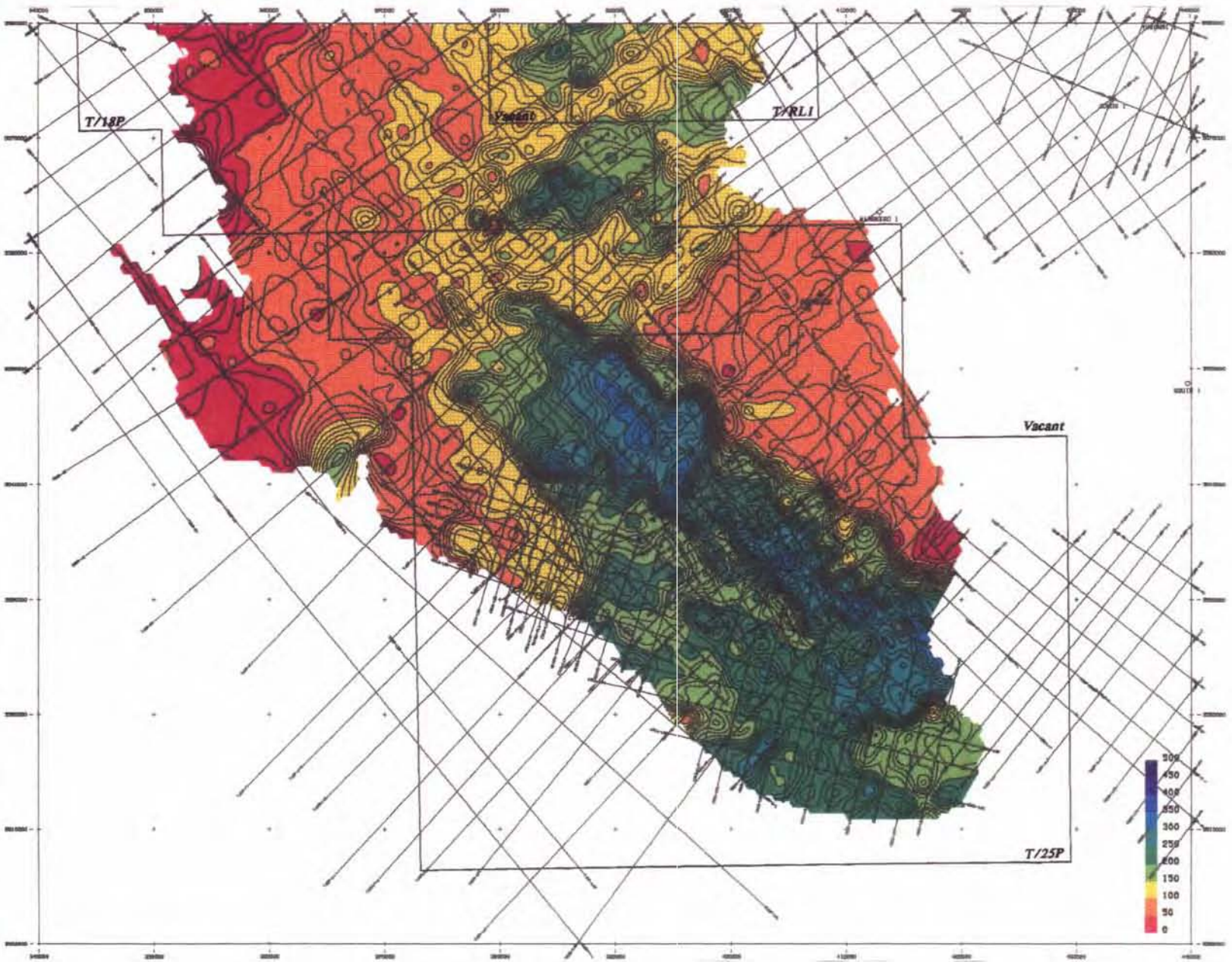
ms TWT

5 cm

FIG. 6.4 Dwg No. 10744

491062

SAGASCO Resources Ltd.



5 cm

N

0 15km.

Scale 1: 500000

BASS BASIN T/25P

ISOCHRON OF

LOWER M.DIVERSUS

FIG. 6.5 BAS10798.DGN

to Pelican 3 regions were prominent areas of thinning presumably due to non-deposition on these more stable platforms. A notable ridge located in the Perkins to Cape Barren region bridges these two platforms, quite distinctly separating the Pelican Trough from the Yolla Trough. It appears that only minor accommodation of sediment occurred in the Yolla Trough during the lower *M.diversus* period. The Bass 3 platform extends nearly to the Flinders 1 location and then swings to the southwest. A deeper platform then extends from Flinders through to Hunter. Thins on this platform that might mark old structures occur near Grindstone and Eddystone; near Lead G; and near the Tregaron Lead (refer to Figure 11.1 for locations).

Interestingly, apart from the Pelican Field, all the wells drilled in the block correspond to lower *M.diversus* thicks ie where depositional troughs were located rather than on old highs.

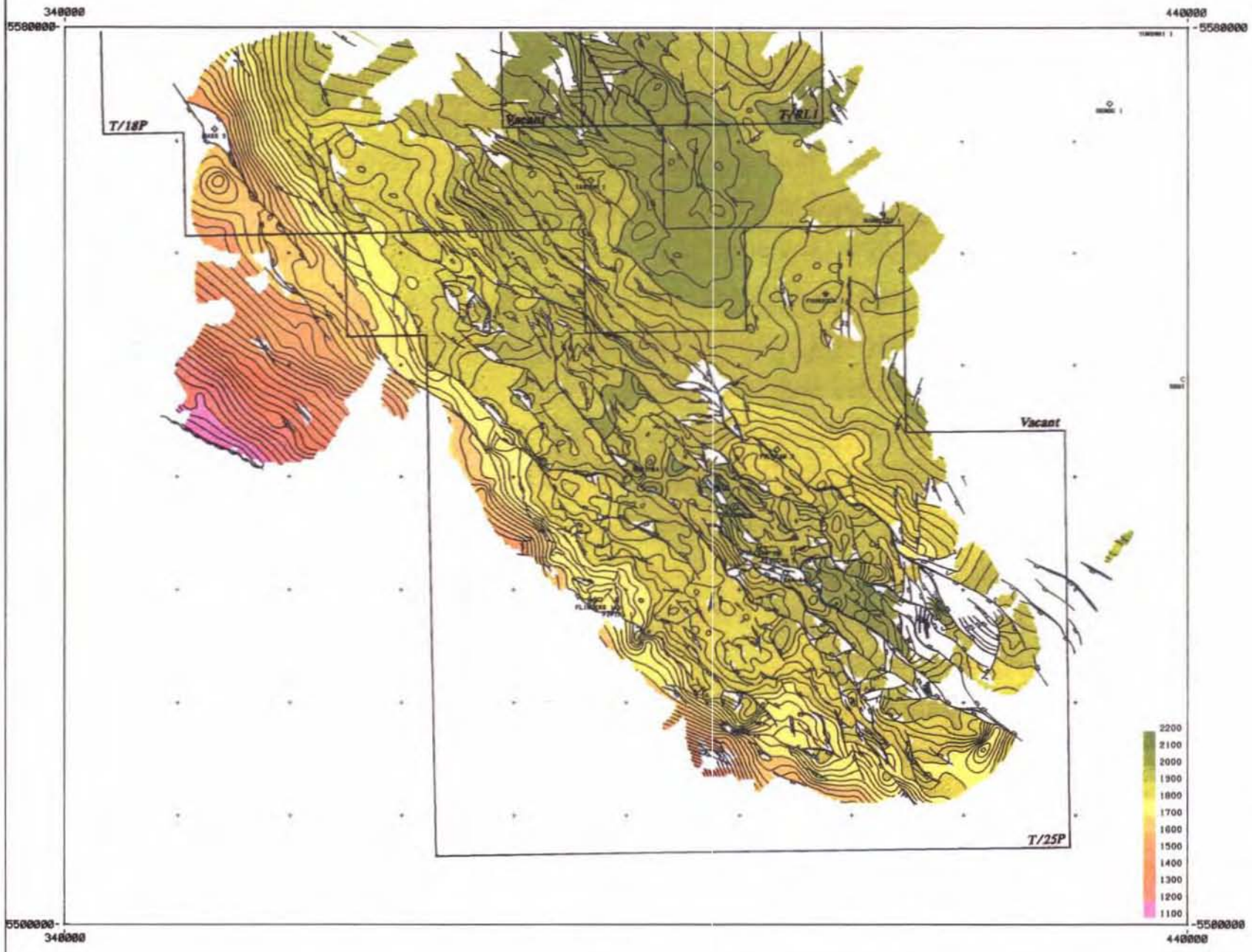
6.4 Middle *M.diversus*

Figure 6.6 (Enclosure 6) "Top Middle *M.diversus*, Time Structure Map (ms TWT)"
Figure 6.7 (Enclosure 7) "Isochron of Middle *M.diversus*"
Figure 11.2 "Top Middle *M.diversus* Leads & Prospects"

Mapped over a similar area to the lower *M.diversus*, the middle *M.diversus* occurs over the time range of 1100 to 2200ms on seismic. Most lower *M.diversus* faults are present at the top of the middle *M.diversus* but with less relief. The top middle *M.diversus* map shows a distinct change in that the Pelican Trough is much less prominent while the Yolla Trough has become very pronounced. This is a reflection of the decreased structural relief of the middle *M.diversus* aged structures which allows the effect of the later basin sag period to be more prominent at the present day. The middle *M.diversus* deposition coincided with a major period of fault growth and early fault reactivation. This corresponds to the onset of fast seafloor spreading in the Southern Ocean (Lowry, 1991). Most fault block geometries were setup during this period and hence most of the possible trapping geometries in T/25P are of this age.

491064

SAGASCO Resources Ltd.



N

0 15km.

Scale 1: 500000

BASS BASIN T/25P

TOP MIDDLE M.DIVERSUS

TIME STRUCTURE MAP

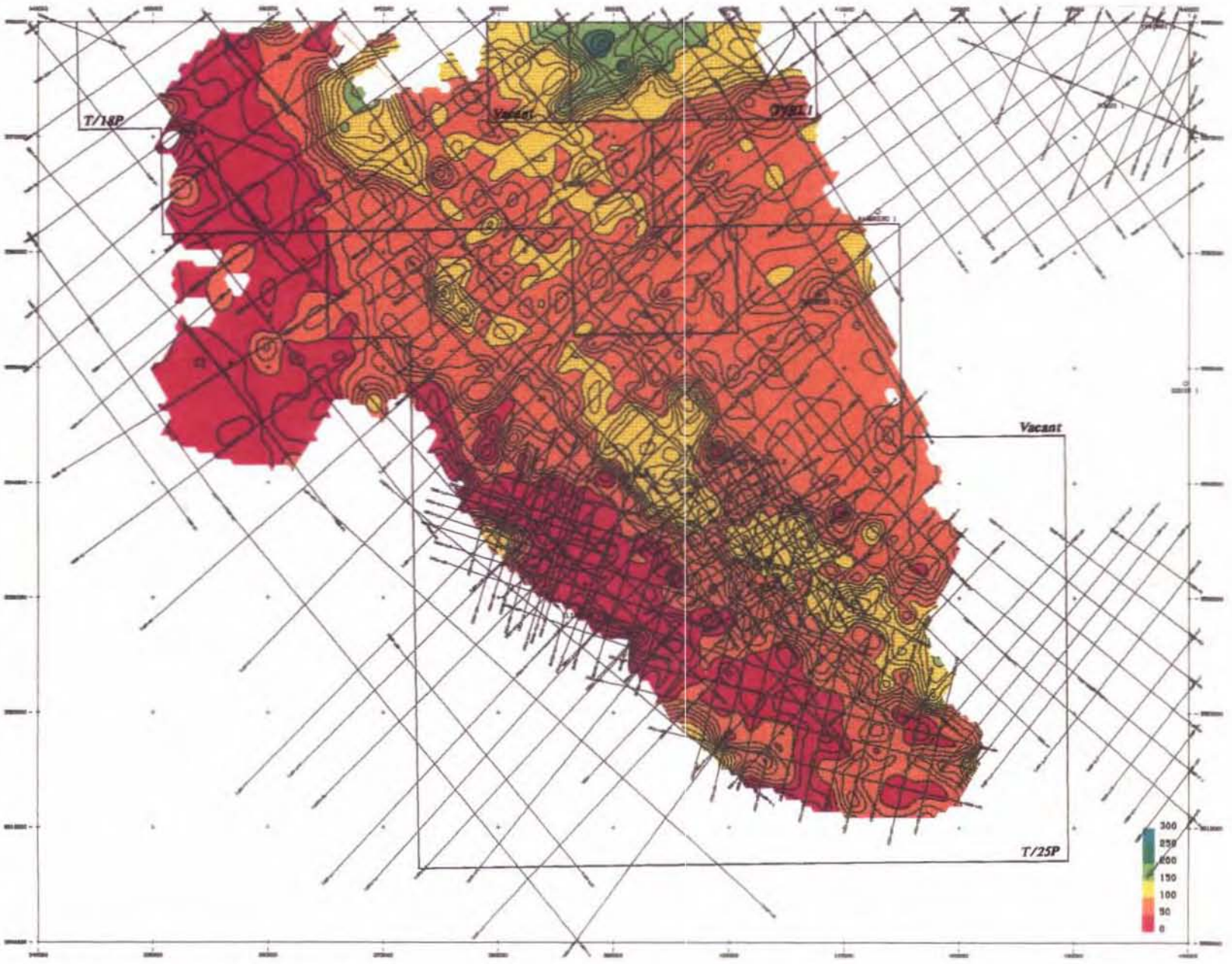
ms TWT

5 cm

FIG. 6.6 Dwg No. 10743

491065

SAGASCO Resources Ltd.



5 cm

N

0 15km.

Scale 1: 500000

BASS BASIN T/25P

ISOCHRON OF

MIDDLE M.DIVERSUS

FIG. 6.7 BAS10799.DGN

The isochron map of the middle *M.diversus* shows the Pelican Trough as being much less prominent, whereas the Yolla Trough is still obvious as a major depocentre. In addition the Southwest Ramp, Poonboon Platform and the ridge area bounding the northern Pelican Trough are distinctly thinned. Evidence from the basin margin suggests that uplift and erosion occurred in the southern basin at the end of middle *M.diversus* time. The reduced relief of the ischron interval map probably reflects a regional unconformity has resulted in mild peneplanation of this area and a low angle subcrop has developed. This unconformity is not readily identifiable on seismic and is inferred from the basin margin observation mentioned above.

6.5 Upper *M.diversus*

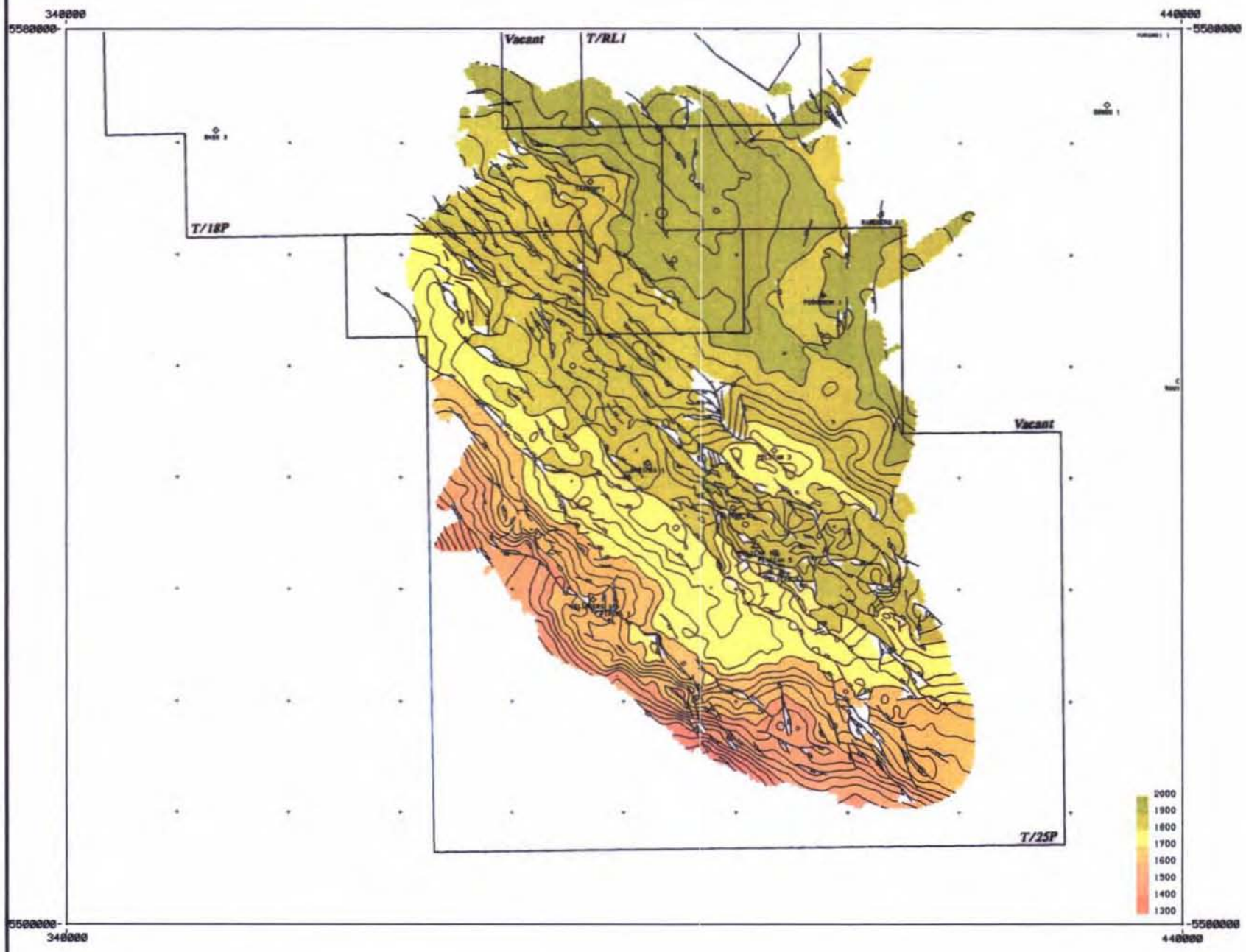
Figure 6.8 (Enclosure 8) "Top Upper *M.diversus*, Time Structure Map (ms TWT)"
Figure 6.9 (Enclosure 9) "Ischron of Upper *M.diversus* (approximately)"
Figure 11.3 "Top Upper *M.diversus* Leads and Prospects"

Few faults persist through to top upper *M.diversus* time so consequently few trapping geometries exist at this level. The structure map shows that the imprint of later basin sag, with its longitudinal axis centred through Poonboon 1, has eclipsed the structurally immature upper *M.diversus* topography at the present day. Also the Miocene enhancement of the Pelican 3 to Tourville area is obvious. The upper *M.diversus* occurs over a time range of 1300ms to 2000ms in the mapped area. As the top upper *M.diversus* is situated above the coaly section the reliability of this marker is much higher than the deeper events.

The isochron map of the upper *M.diversus* shows that a broad depositional basin had developed in the southern Pelican Trough. The Poonboon Platform has prominent thins developed on it showing this region to be structurally high at this time, but some thinning no doubt also occurs through erosion following upper *M.diversus* deposition as discussed in "Regional Geology". The Clarke area was structurally high at upper *M.diversus* time. Further north of this area near Bass 3 the upper *M.diversus* is subcropped, being interpreted as absent over this Early Cretaceous high. This subcrop means that the upper *M.diversus* map does not cover as much area as the one from the middle *M.diversus*.

491067

SAGASCO Resources Ltd.



5 cm

N

0 15km.

Scale 1: 500000

BASS BASIN T/25P

TOP UPPER M.DIVERSUS

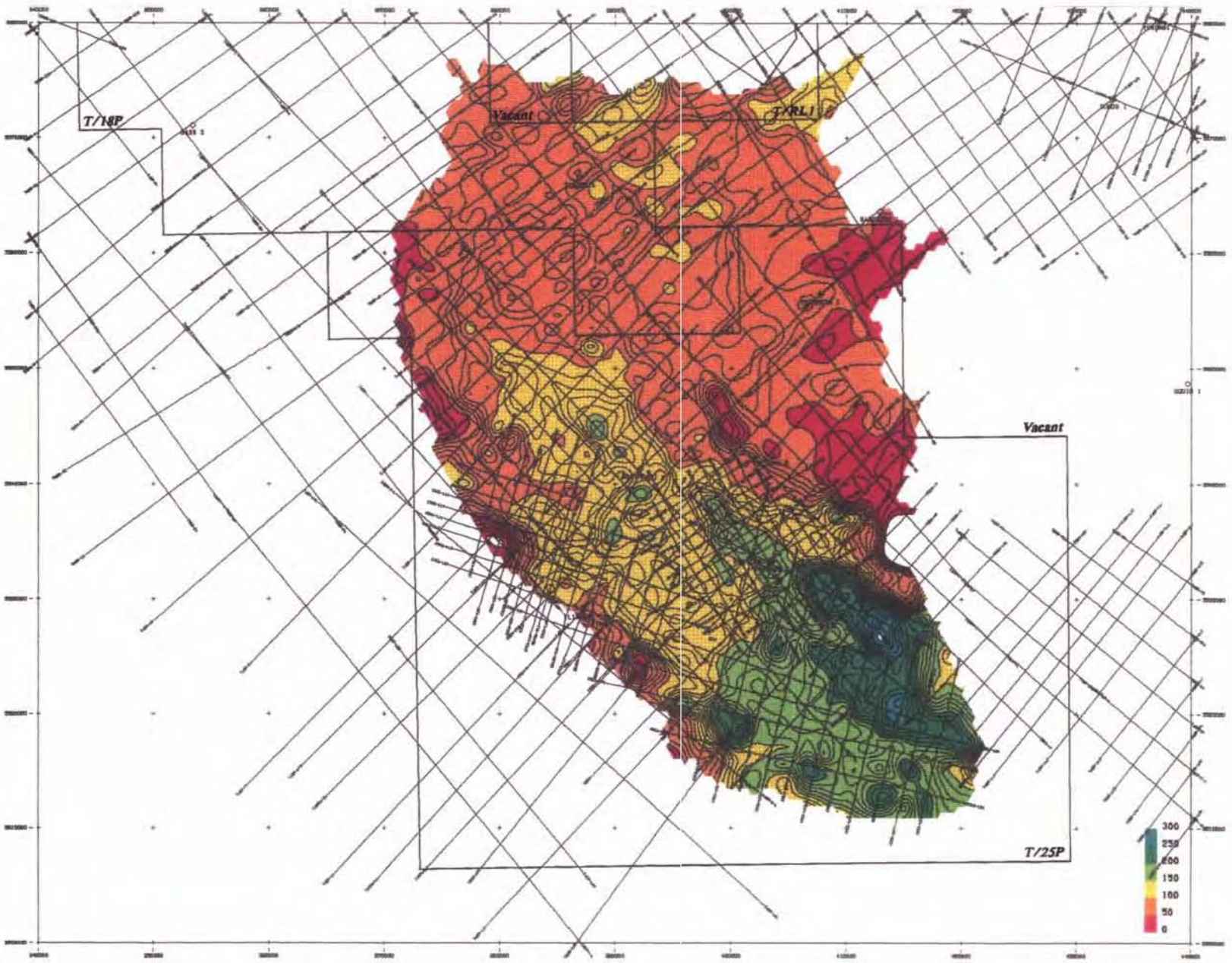
TIME STRUCTURE MAP

ms TWT

FIG. 6.8 Dwg No. 10742

491068

SAGASCO Resources Ltd.



5 cm

N

0 15km.

Scale 1:500000

BASS BASIN T/25P

ISOCHRON OF

UPPER M.DIVERSUS

FIG. 6.9 BAS10800.DGN

6.6 Top Eastern View Coal Measures

Figure 6.10 (Enclosure 10) "Top EVCM, Time Structure Map (ms TWT)"
Figure 6.11 (Enclosure 11) "Isochron of post-*M.diversus* EVCM"
Figure 11.4 "Top EVCM Leads & Prospects"

The "Upper" Eastern View blankets much of the basin with relatively uniform deposition. Consequently the "Top EVCM" is an easy pick on the seismic and has been mapped over a wide area. It has a seismic time range of 600ms to 1800ms in the mapped area. The post EVCM basin sag centred longitudinally through Poonboon 1 dominates the map, but some structural culminations are present at Bass 3, Tarook 1, Flinders 1 (Pipipa 1), Poonboon 1 and at the Tourville and Hunter Leads. Drape over early structures has resulted in the highs at Bass 3, Poonboon 1 and Tourville, while the other culminations result from uplift due to the implacement of Miocene aged intrusives.

The edge of the entire EVCM package can be seen in the southwest corner of T/25P, while just to the northwest of the block some unusual geologic features are present. These could be "pop-up" structures caused during a late compression event or due to the emplacement of intrusive bodies but unfortunately are illdefined and poorly resolved by the current seismic grid.

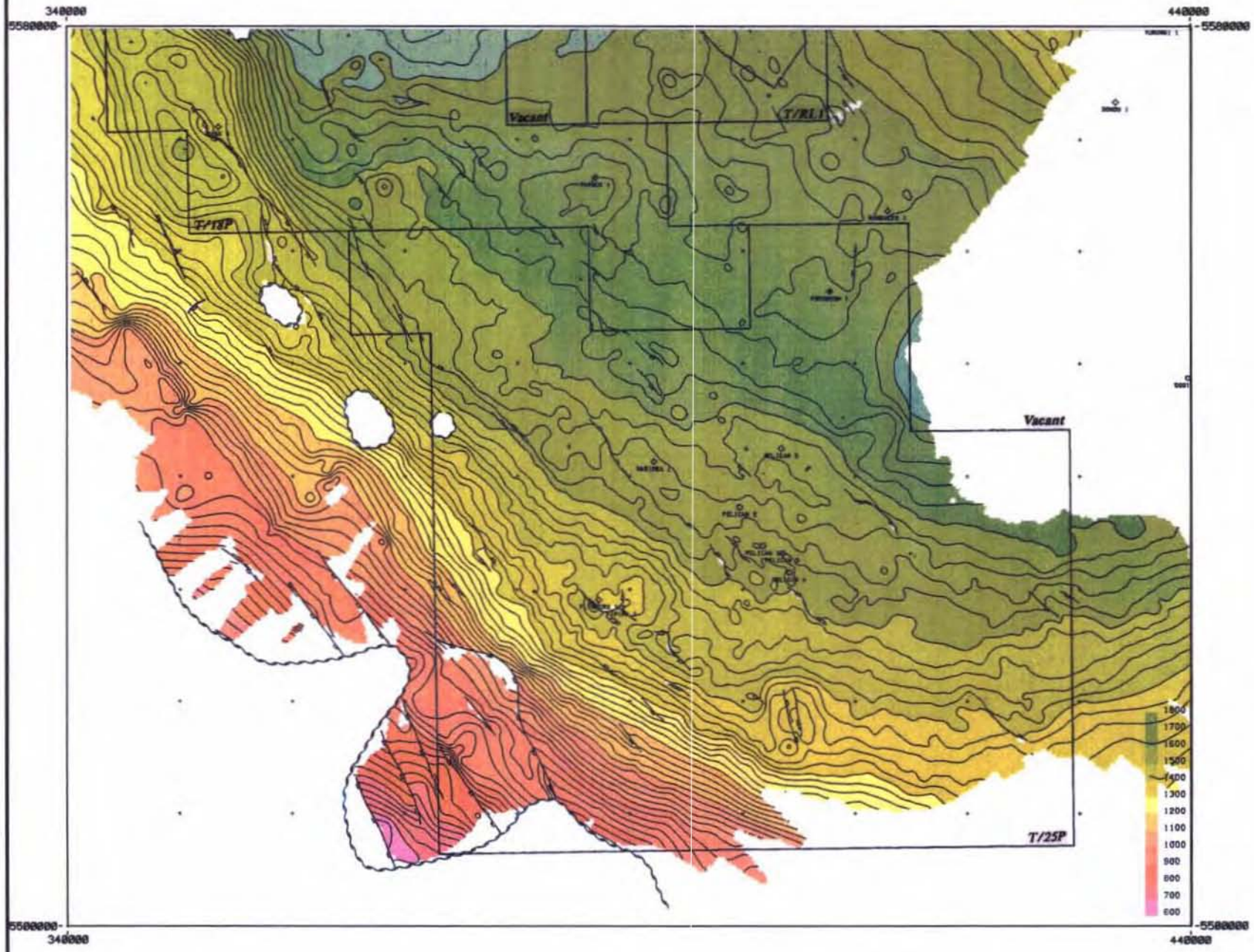
The isochron map of the post-*M.diversus* EVCM ("Upper" EVCM) shows that a gentle sag was still present in both the Pelican Trough and the Yolla Trough at this time. The Pelican 3 high was a very prominent structure as evidenced by the significant thinning there during the "Upper" EVCM's deposition. The Clarke Lead was also in a zone of thinning indicating that it had remained as a high during this period. Other notable thins occur over the old Pipipa North Lead and in the Grindstone and Eddystone area.

6.7 Top Demon's Bluff Formation

Figure 6.12 (Enclosure 12) "Top Demon's Bluff Formation, Time Structure Map (ms TWT)"
Figure 6.13 (Enclosure 13) "Isochron of Demon's Bluff"

491670

SAGASCO Resources Ltd.



5 cm

N

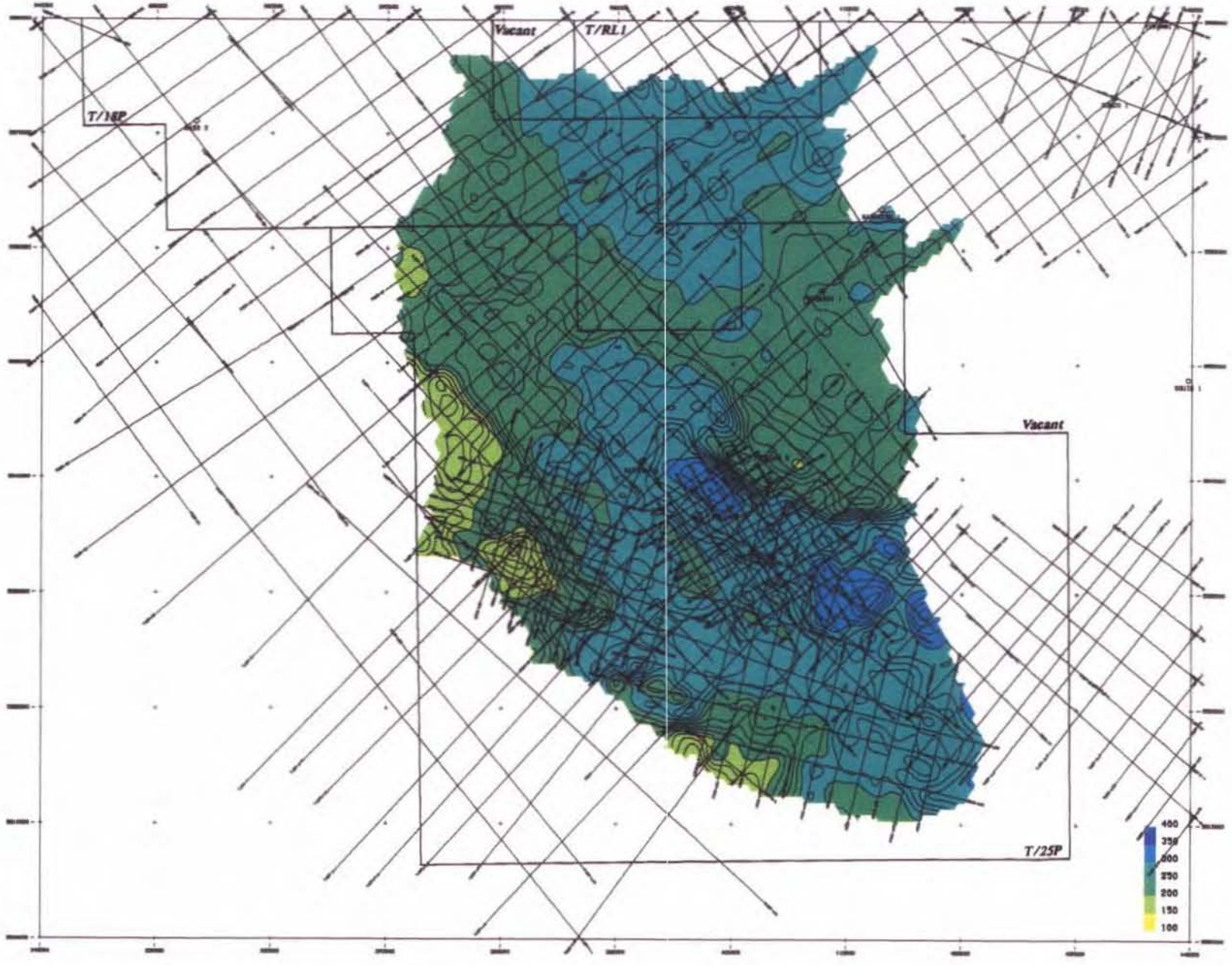
0 15km.

Scale 1: 500000

BASS BASIN T/25P
TOP EVCM
TIME STRUCTURE MAP
ms TWT

FIG. 6.10 Dwg No. 10741

SAGASCO Resources Ltd.



5 cm

N

0 15km.

Scale 1:500000

BASS BASIN T/25P

ISOCHRON OF

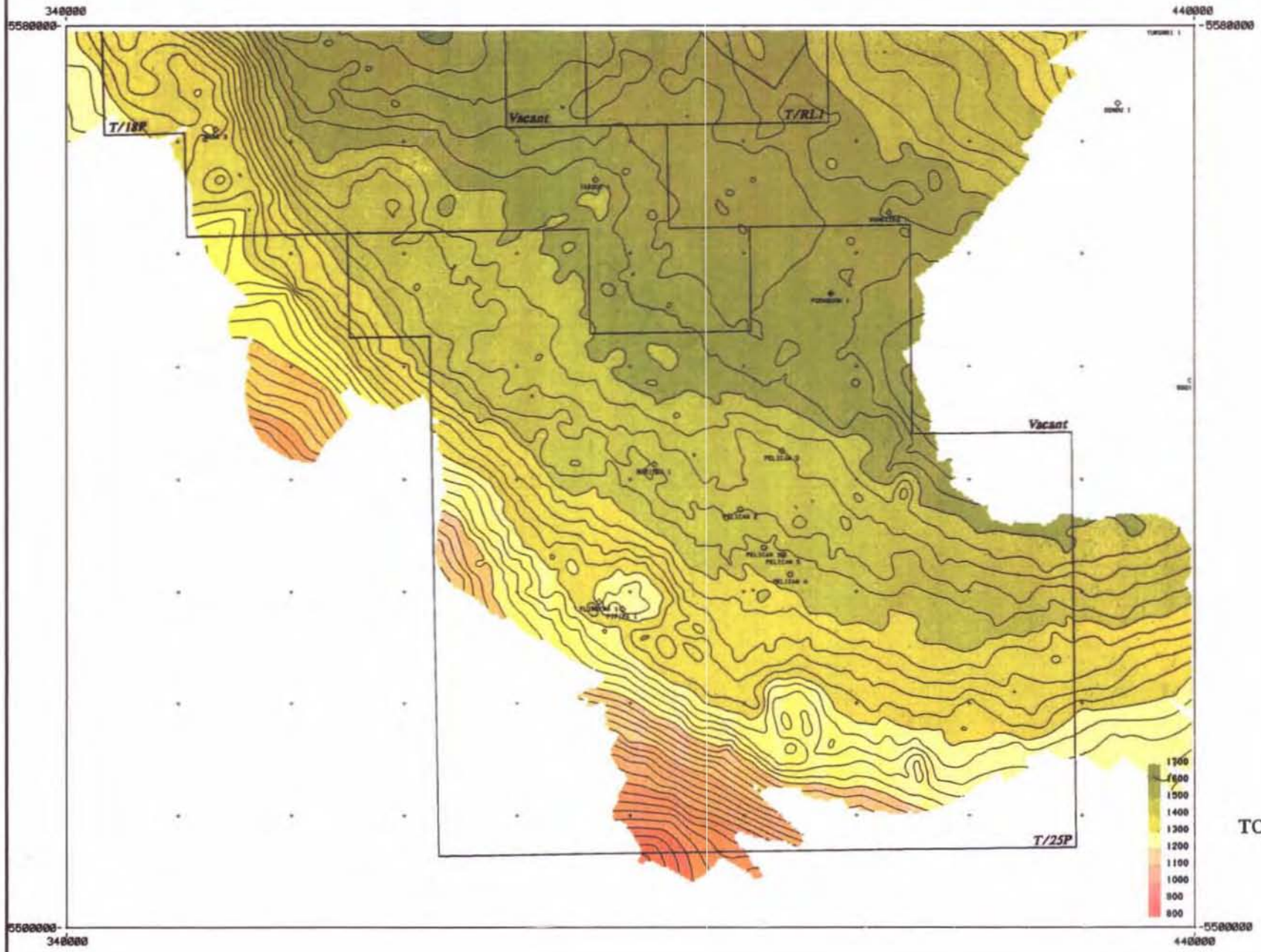
POST M.DIVERSUS

EVCM

FIG. 6.11 BAS10801.DGN

491072

SAGASCO Resources Ltd.



5 cm

N

0 15km.

Scale 1: 500000

BASS BASIN T/25P

TOP DEMON'S BLUFF FORMATION

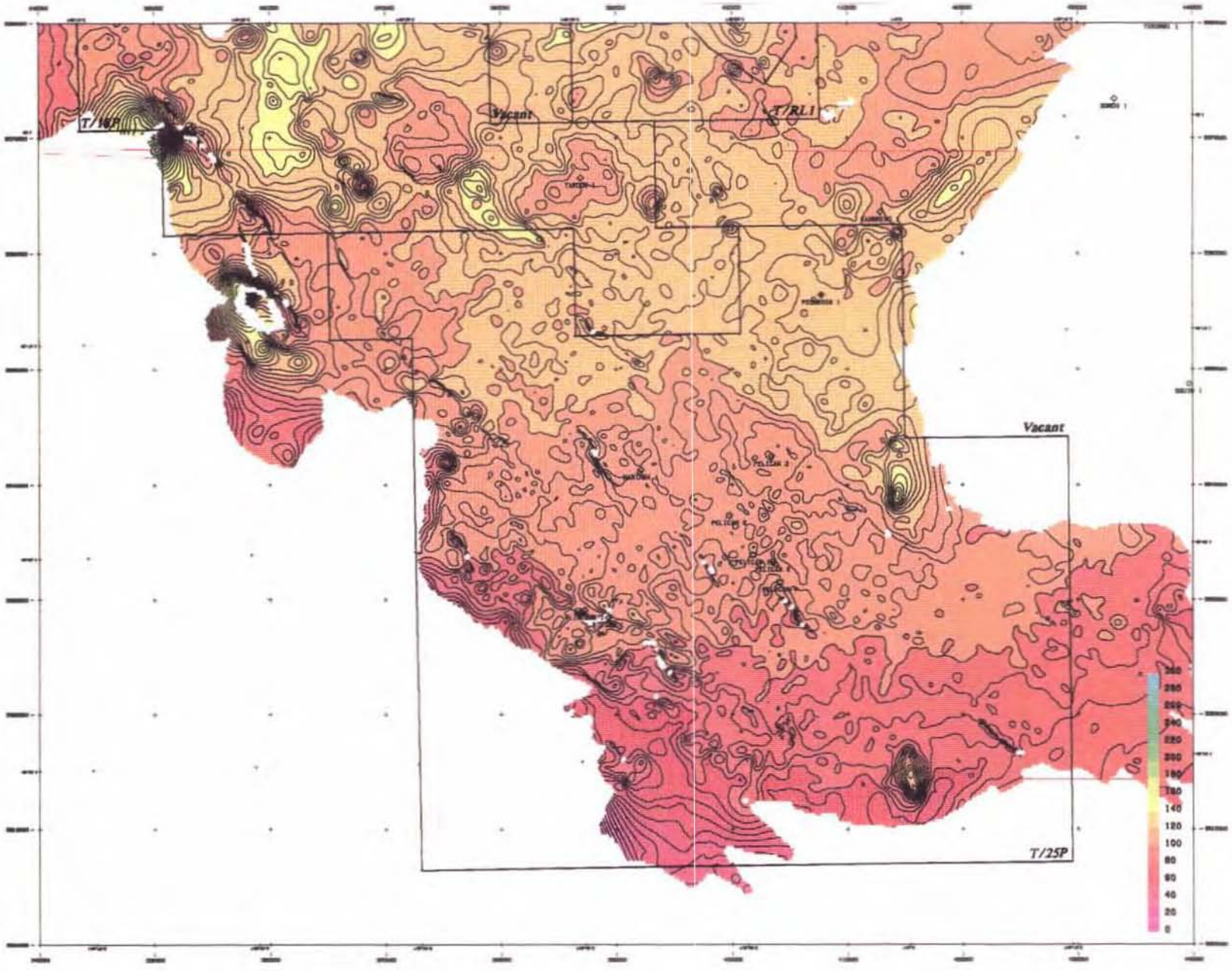
TIME STRUCTURE MAP

ms TWT

FIG. 6.12 Dwg No. 10740

491073

SAGASCO Resources Ltd.



5 cm

N

0 15km.

Scale 1: 500000

BASS BASIN T/25P

ISOCHRON OF
DEMON'S BLUFF
(approx.)

FIG. 6.13 BAS10803.DGN

The Demon's Bluff was mapped over a wide area and occurs over a time range of 800 to 1700ms on the seismic data. Structurally the top Demon's Bluff is very similar to the top EVCM, although fewer faults penetrate this level. Only Flinders and Hunter stand out as prominent culminations on a map that shows mostly regional basin sag. The long axis of this basin is still NW-SE and through Poonboon 1. The Demon's Bluff isochron shows that an almost E-W depositional basin has formed during Demon's Bluff deposition with its longitudinal axis centred near Tarook. Thins occur at Clarke Lead and Tarook indicating that these features were structurally high at this time.

6.8 Late Oligocene Reflector

Figure 6.14 (Enclosure 14) "Late Oligocene Reflector, Time Structure Map (ms TWT)"

Figure 6.15 (Enclosure 15) "Isochron from Top Demon's Bluff to Upper Oligocene"

This Late Oligocene Reflector was chosen because it sits just below the Miocene/Oligocene unconformity and thus it might show the effect of a Miocene compressional event. The event was mapped over most of T/25P and well into southern T/18P. It varies from 400 to 1300ms on the seismic data in the mapped area.

The structure map shows that this level was affected by a downwarping basin sag event centred southeast of Poonboon 1. To this extent it does not look too different to the top Demon's Bluff map. The deformations caused by the Miocene aged Flinders intrusion is pronounced as is the drape over an Oligocene Volcano near the Clarke Lead.

The isochron of the Late Eocene to Late Oligocene interval shows that the depocentre for this unit has moved northeast a considerable distance (in fact off the mapped area) to the extent that it may be centred just south of Aroo. Another small depocentre is located at Flinders. The thinning of this interval over the Hunter Lead indicates the intrusion present in the *M.diversus* sequence has almost certainly occurred before the end of the Late Oligocene but most probably in the Early Oligocene. This contrasts

491075

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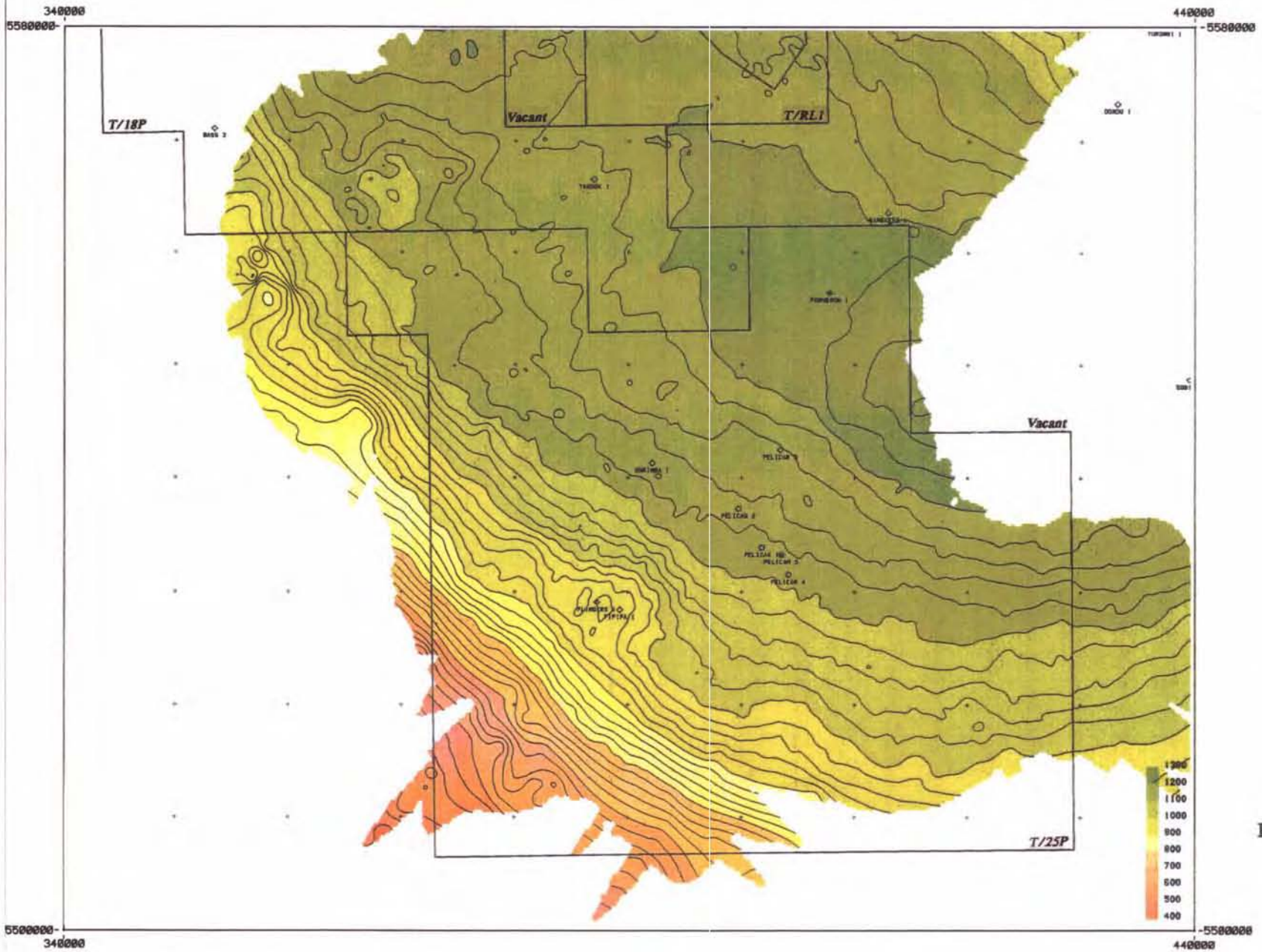


5 cm

N

0 15km.

Scale 1: 500000

BASS BASIN T/25P

LATE OLIGOCENE REFLECTOR

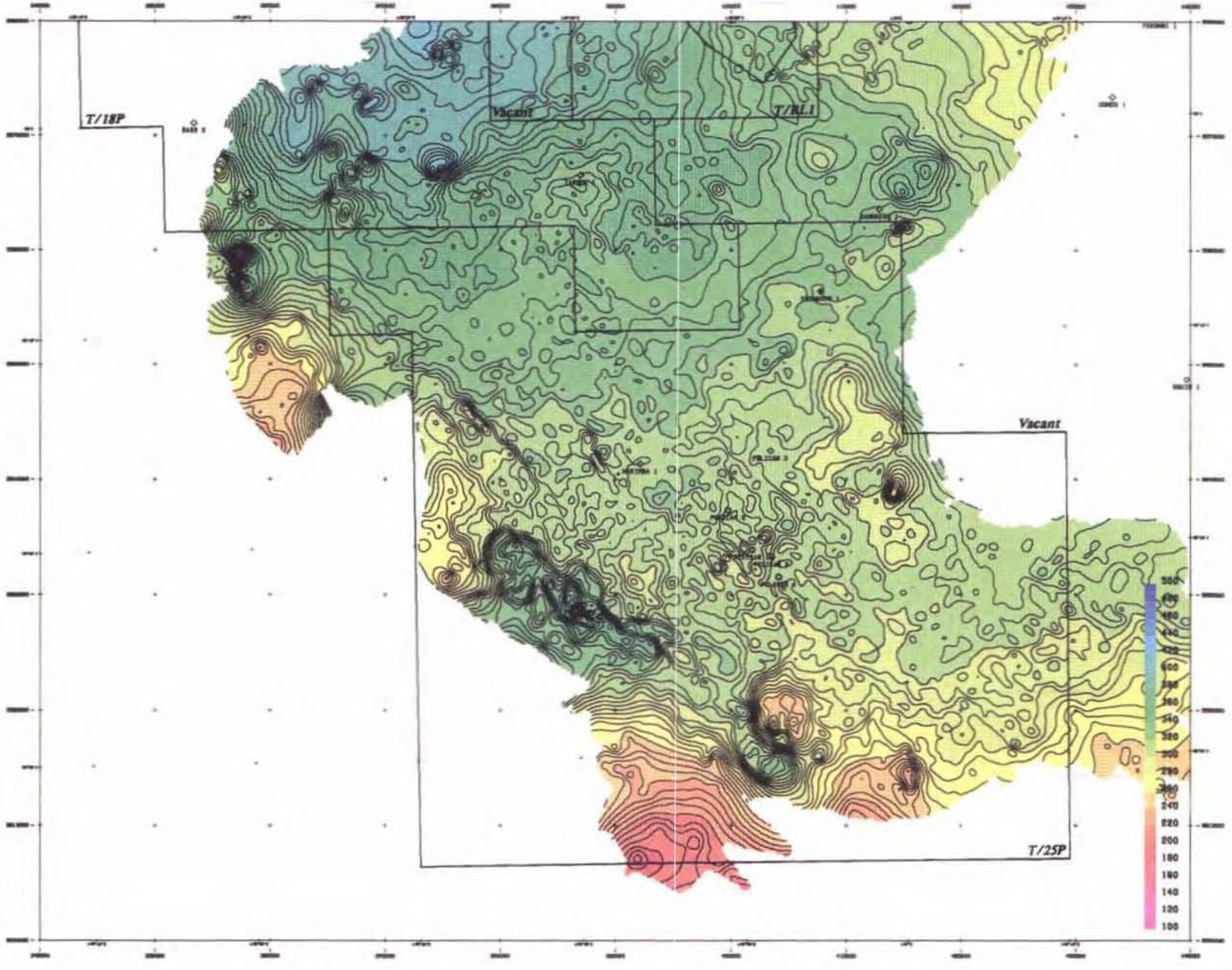
TIME STRUCTURE MAP

ms TWT

FIG. 6.14 Dwg No. 10748

491076

SAGASCO Resources Ltd.



5 cm

N

0 15km.

Scale 1: 500000

BASS BASIN T/25P

ISOCHRON FROM DEMON'S BLUFF TO LATE OLIGOCENE (approx.)

FIG. 6.15 BAS10804.DGN

with Flinders which corresponds to a thickened sequence implying, therefore, that it did not have its sill implaced during the Oligocene. Other thins occur on the Poonboon Platform corresponding with Early Oligocene extrusives.

6.9 Early Miocene Reflector

Figure 6.16 (Enclosure 16) "Early Miocene Reflector, Time Structure Map (ms TWT)"

Figure 6.17 (Enclosure 17) "Isochron from Late Oligocene to Early Miocene"

The Early Miocene Reflector was mapped over a wide area and occurs over a time range of 400 to 1200ms on the seismic data. The structure map of this level is relatively featureless showing a NW-SE deep centred near Poonboon 1 or Nangkero 1. The Flinders-Pipipa area shows as a prominent nose with a smaller version located at Hunter.

The isochron of the Upper Oligocene to Base Miocene, which straddles the base Miocene unconformity is quite uniform showing an east-west trough located south of Pelican Field, north of Hunter and east of Flinders.

The fact that Flinders and Hunter are both thins on this map and observing the nose at Flinders on the structure map, is an indication that the intrusive encountered in the *M.diversus* interval of Flinders has probably been implaced during this period.

6.10 Late Miocene Reflector

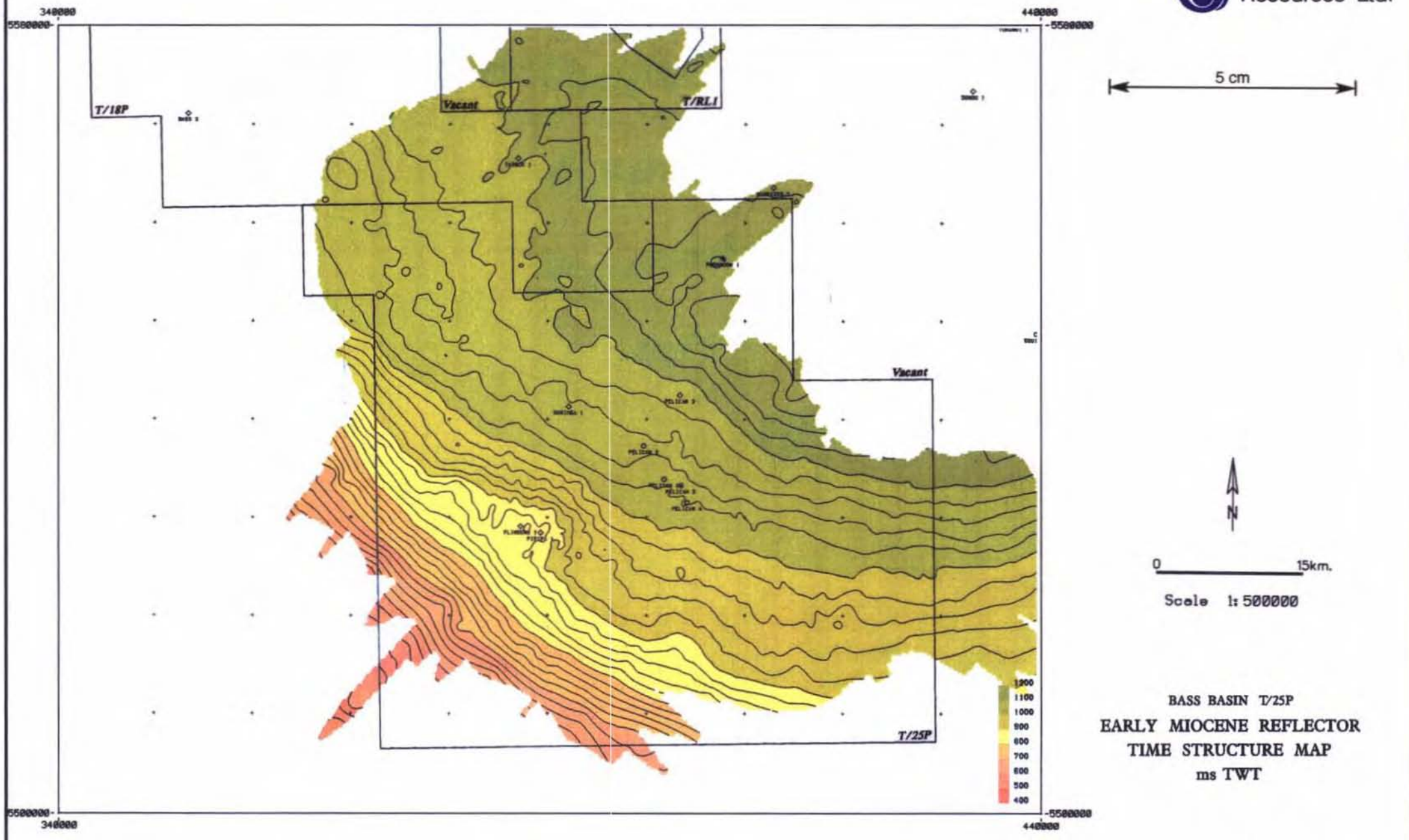
Figure 6.18 (Enclosure 18) "Late Miocene Reflector, Time Structure Map (ms TWT)"

Figure 6.19 (Enclosure 19) "Isochron of Early to Late Miocene"

The Late Miocene Reflector was mapped over almost all T/25P and a significant area north of the permit. It varies from 300 to 1000ms on the seismic data in the mapped area. A NW-SE trough dominates this map, the shallowest horizon mapped. This broad feature has been prevalent in all the structure maps above the upper *M.diversus*

491078

SAGASCO Resources Ltd.



5 cm

N

0 15km.

Scale 1: 500000

BASS BASIN T/25P

EARLY MIOCENE REFLECTOR

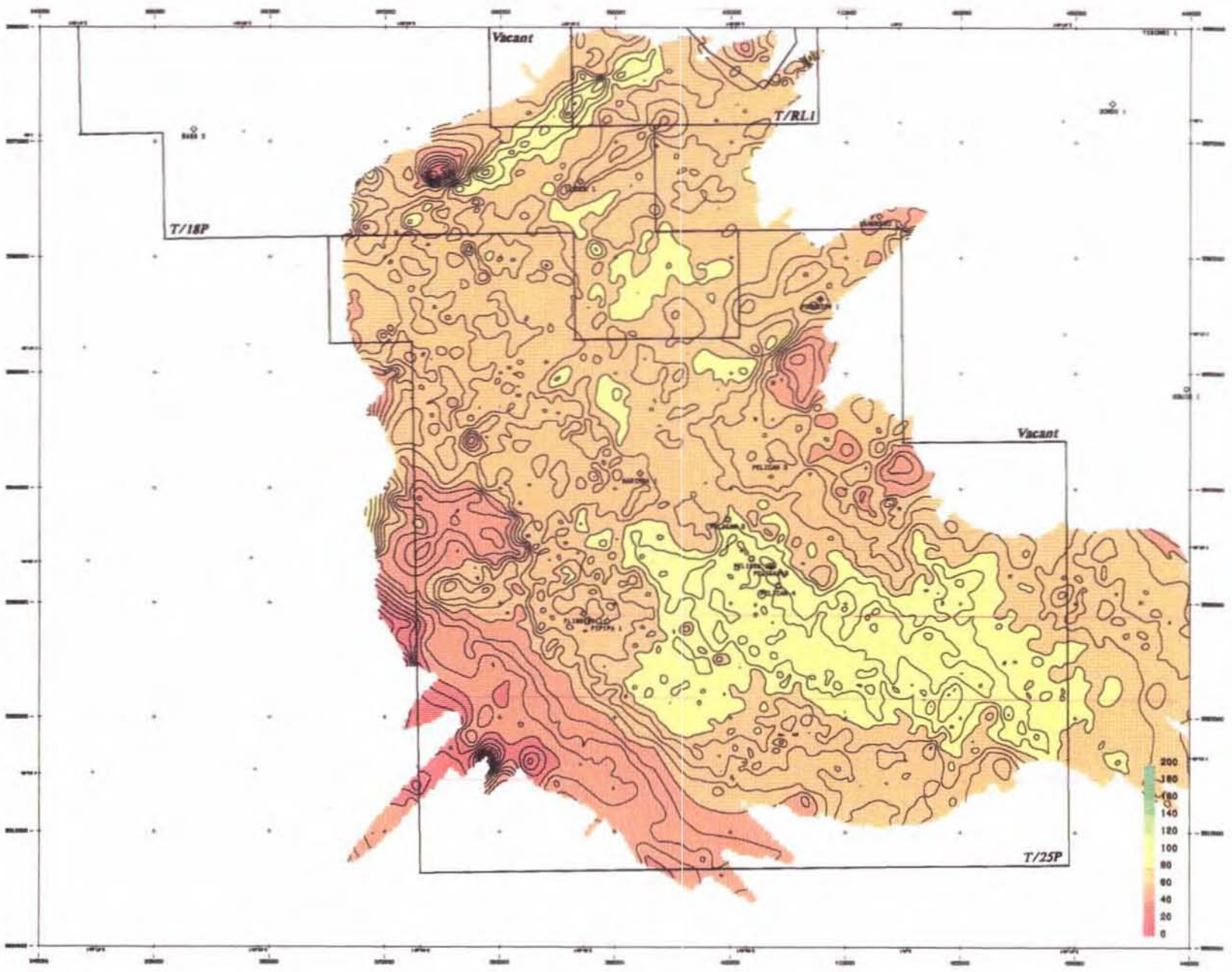
TIME STRUCTURE MAP

ms TWT

FIG. 6.16 Dwg No. 18746

491079

SAGASCO Resources Ltd.



5 cm

N

0 15km.

Scale 1: 500000

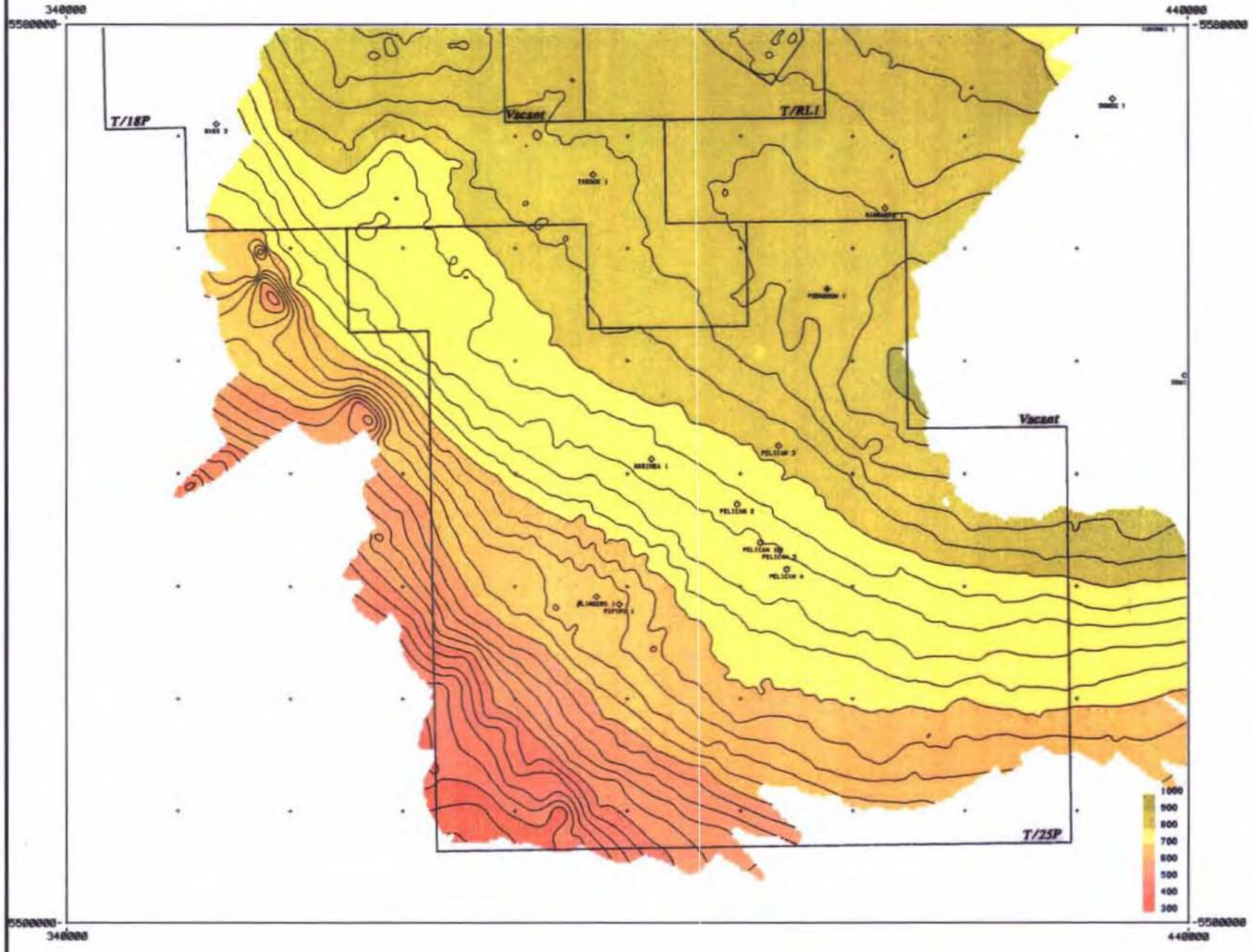
BASS BASIN T/25P

ISOCHRON FROM LATE OLIGOCENE TO EARLY MIOCENE (approx.)

FIG. 6.17 BAS10805.DGN

491080

SAGASCO Resources Ltd.



5 cm

N

0 15km.

Scale 1: 500000

BASS BASIN T/25P

LATE MIOCENE REFLECTOR

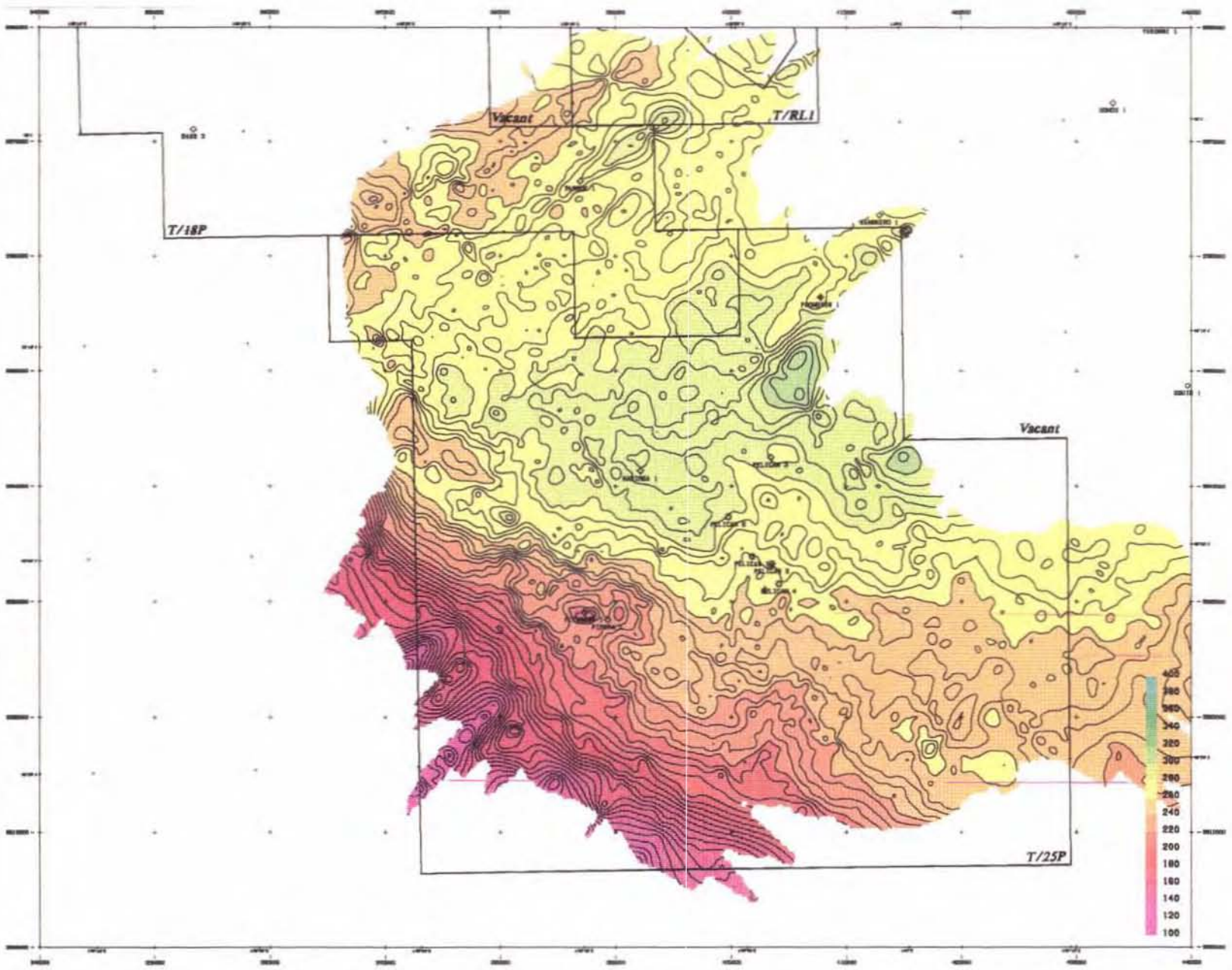
TIME STRUCTURE MAP

ms TWT

FIG. 6.18 Dwg No. 10747

491081

SAGASCO Resources Ltd.



5 cm

N

0 15km.

Scale 1: 500000

BASS BASIN T/25P

ISOCHRON OF EARLY TO LATE MIOCENE (approx.)

FIG. 6.19 BAS10806.DGN

level, indicating that it is of relatively recent age, perhaps being a manifestation of the Kiosciusko uplift which culminated during the late Pliocene to early Pleistocene and has gently folded Tertiary aged strata in the adjacent Torquay Basin (C Abele, 1976).

The isochron of the Early to Late Miocene shows an east-west trough centred south of Poonboon 1, but north of Pelican 3. A distinct thin occurs at Flinders-Pipipa giving a firm indication that the intrusive emplacement in the *M.diversus* occurred either in the uppermost Late Oligocene or Early Miocene. Quite a strong nose, located from Pelican 3 to Hunter, is an interesting feature seen on this map.

6.11 Exploration Implications from the Structural Analysis

Structural Timing

Migration timing is discussed in Chapter 10 so it is useful to summarise the structural timing in the Bass Basin as a prelude to that.

Structures started forming in the Bass Basin in the Early Cretaceous but few of these have been preserved unmodified because of later tectonics. These structures are mostly deep and ill defined due to the poor quality (at depth) and often sparse seismic data. It is likely that Cretaceous trapping geometries may exist in all structural provinces presented (Figure 2.2), but structures in the Pelican Trough are likely to be too deep and have little reservoir quality preserved. The shallowest Cretaceous aged trap probably exists on the Southwest Ramp as a stratigraphic play.

From the Palaeocene to the upper *M.diversus* a spectrum of trap development possibilities exists due to the relatively continuous period of normal faulting associated with rifting. Most traps in T/25P are therefore no younger than upper *M.diversus* in age (but mostly middle *M.diversus*) as this extensional period was followed by a structurally quiescent time which persisted until the end of the Oligocene. At this time gentle folding and igneous activities occurred associated with a mild compressional event. Most structures were enhanced during these tectonics and some culminations were created after plutonic bodies were wedged into the country rock.

Another folding event occurred in the Pliocene (presumably), but this was very gentle, although it did set up the present day NW-SE basin geometry which is visible on (or dominates) most horizons mapped.

Trapping Geometries

The predominantly extensional regime has created a rift basin style tectonic province with repetitive NW-SE longitudinal normal faults and tilted fault blocks. The scale of this faulting is bimodal: fault blocks of mostly *M.diversus* age having a width of just a few kilometres are cradled within mega-scale basin-forming Cretaceous half-grabens set up by major basement involved normal faults. The *M.diversus* faulting sets up many opportunities for trapping geometries to develop, but these faults are mostly within the Pelican Trough structural province. These are generally high-side fault closures against NW-SE faults and rely on cross-fault seals for trapping. The dilemma is that we need these faults to act as conduits from deeper mature source rocks, but in a repetitive sequence of sands, coals and shales this is a reasonable expectation. If we assume that a hydrocarbon trap only develops when fortuitously a sandstone lying beneath a good sealing unit is juxtaposed, during fault movements, against another sealing unit and the fault does not leak under these circumstances, then within the deeper section with sandstone juxtaposed against sandstone across or along the fault plane, a tortuous vertical migration route is possible.

In the Bass Basin the only hydrocarbon accumulation which occurs above the *M.diversus* sequence is at Yolla. Sitting at a junction between major structural provinces it is likely that frequent fault movements have allowed oil to leak vertically and be trapped under the Demon's Bluff at that location. A similar setting is not apparent in T/25P, so top EVCM accumulations are not likely. In T/25P therefore the *M.diversus*, Palaeocene and Cretaceous shales must provide efficient top seals to migrating hydrocarbons and cross faults sealing is then required for traps to develop. The Pelican Field accumulation clearly demonstrates that the described geometries exist in T/25P. Unfortunately this field is a little too deep for good reservoir development but many other leads have been identified at higher structural levels that may avoid this problem.

The Poonboon Platform is ill defined by the current seismic grid and it is hoped that the 1994 Rocky Cape Seismic Survey will help solve some of the interpretation dilemmas in this province. It is likely that a semi-regional high quality seismic grid specifically designed for this area will be required to identify leads on the Platform. The current interpretation does identify that trapping geometries may exist there. Drape over Cretaceous aged structures has set up some broad anticlinal features the size of which justifies further investigation. A bonus in this area is significantly better reservoir quality so pursuing Palaeocene and Cretaceous culminations is feasible.

The Southwest Ramp structural province beyond the Flinders-Hunter trend is very poorly defined by seismic. The data quality can be poor and is corrupted by Miocene extrusives in some areas, nevertheless it appears that a significant subcrop geometry exists caused by upper and middle *M.diversus* unconformities. In addition onlap of sediments onto tilted basement provides another trapping possibility. A good quality semi-regional seismic program would be needed to establish specific leads in this area.

7 EASTERN VIEW COAL MEASURES RESERVOIR STUDIES

7.1 Objectives

The major objective of this reservoir study was to improve the understanding of reservoir development within the Eastern View Coal Measures within and around T/25P. Good reservoir development is important both in providing commercially producible hydrocarbon reservoirs and to provide conduits for migrating hydrocarbons.

7.2 Introduction

Identification and prediction of good quality reservoir development in association with trapping configurations is one of the most difficult aspects of prospectivity evaluation in the Eastern View Coal Measures.

This study reviews previous reservoir studies, addresses some new observations based on measured core porosity and permeability data, and examines the distribution of reservoir trends to determine if any predictive models can be used to evaluate reservoir development in assessing the prospectivity of the permit.

Previous drilling in T/25P, especially in the Pelican Field, has shown that despite having good log and core plug measured porosity many of the sandstones below the top of the middle *M.diversus* zone have relatively poor permeability. This observation was particularly relevant at Pelican 5 where despite encouraging shows of gas and condensate all the zones tested failed to flow at commercial rates.

Drilling results outside of T/25P in the Bass Basin, at Yolla 1, have shown that economical flow rates can be achieved from quite deeply buried (approximately 2800 metres) reservoirs with a good RFT recovery at 2988m.

Key questions therefore are:

- Are the results from Pelican 5 representative for all Pelican Field wells and for all of T/25P?
- Why are the reservoirs at Yolla 1 different? and is there potential for similar reservoir development in T/25P?
- Which are the major controls on reservoir development, provenance, compaction, diagenesis, or depositional facies?

7.3 Previous Studies

There have been several significant studies of reservoir development in the Eastern View Coal Measures during the last decade, and key conclusions of these studies are outlined below:

Aquing (1980) observed that the Eastern View Coal measures consist mainly of shale in the lower part, but become increasingly rich in coal and sandstone in the upper part. It was also concluded that the main provenance areas were to the southwest and southeast on the Tasmanian Block and to the east on the Bassian Rise. The Australian mainland to the north was considered to have been a minor sediment source.

The first detailed petrographic study of reservoir development in the Bass Basin was conducted by Meszoly *et al* (1986) who examined the diagenesis of Eastern View Coal Measures sandstones. Meszoly *et al* (1986) recognised two diagenetic patterns which they referred to as Bass type and Pelican type patterns.

Bass Type

The Bass type diagenetic pattern primarily features carbonate authigenesis, a major cause of porosity occlusion, and is typical of sandstones with high sand-shale ratios in the upper part of the Eastern View Coal Measures above about 1950 metres. Dolomite cement is associated with coarse grained sandstones, whilst siderite cement is typical in finer grained sandstones containing carbonaceous laminae.

Pelican Type

The Pelican type diagenetic pattern is typical of sandstones below 2000 metres and overprints Bass type diagenetic effects. At shallow levels there is widespread dissolution of carbonate cement, lithic fragments and feldspar grains. Later diagenetic changes relate to the destruction of this secondary porosity and include mechanical compaction, quartz overgrowth cementation, and kaolinite precipitation and alteration. With increased depth intense quartz overgrowths, local quartz solution and reprecipitation are observed, whilst authigenic illite becomes more dominant than kaolinite in the pore space.

Meszoly *et al* (1986) also observed that log derived porosity-depth profiles for Eastern View Coal Measure sandstones show marked variation (0-36%). However there is a general trend of higher porosity in the upper EVCM declining at a rate of approximately 5.7% per 1000 metres.

Studies of the stable carbon isotope data for the carbonate cements indicated organic sourcing rather than from fluid migration from the marine carbonate sequences of the overlying Torquay Group.

Finally, Meszoly *et al* (1986) concluded that potential reservoir quality is greatest between 1900 and 2700 metres.

Suttill *et al* (1987) reported on a sedimentological analysis of most of the core from the EVCM. The objective of the study was to interpret sufficient core in order to construct a depositional model of reservoir distribution which could be used to assist in evaluation of the prospectivity of the Bass Basin. The study involved the logging of core identifying sedimentological facies, grouping these into facies associations and then developing a depositional model. The facies logs were depth matched as closely as possible to wireline data and displayed together with core analysis data.

The study generated the following conclusions relating reservoir development to prospectivity:

1) Thick, permeable reservoir sands with good deliverability characteristics are developed in the Bass Basin.
2) They occur as shoreline sand facies developed on the margins of large wave affected lacustrine systems.
3) They commonly occur as stacked sequences. This increases the chance of intersecting good thicknesses of cumulative reservoir sandstones.
4) Sand distribution can be grossly predicted, but well control alone does not allow detailed prediction of the distribution of specific sand bodies for specific prospects.

Technical conclusions from the study are:

1) The depositional model for the EVCM incorporates a variety of sub-environments generated in a fluvial to deltaic and shoreface setting.
2) The sub-environments represented include offshore, lower middle and upper shoreface, backshore/beach, stranded beach ridge (with washovers), possible tidal channels (runnels), back barrier coal marsh deposits, fluvial channel fills, barforms, abandonment features, crevasse splays, floodbasin lakes and interdistributary bays.
3) The delta profile represented by the EVCM is interpreted to be the result of a wave dominated delta system, modern analogues include the Sao Francisco Delta, Brazil and the Senegal Delta, W. Africa.
4) The Bass Basin delta was formed in a restricted embayment or large lake with minor marine incursions. In this context the Rhone Delta building out into the Mediterranean Sea provides a modern analogue of a wave dominated delta building out into a restricted sea. An example of such a delta forming in a lake is provided by the modern William River Delta prograding into Lake Athabasca, N.W.T. Canada.

5) Sandstones and hence reservoirs within the Bass Basin belong to one of four facies associations:

a Shoreface/Backshore/Lagoon

b Beach/Fluvial Channel Interface

c Simple or Stacked Fluvial Channel

d ?Tidal Channel/Beach

6) There are clear relationships between reservoir properties and facies.

7) The facies association containing shoreface/backshore and lagoonal sandstones contains reservoirs with the best reservoir properties, exemplified by Dondu 1, core 1.

8) Correlation of core facies logs with wireline logs is generally good and extrapolation of facies to uncored neighbouring wells can be performed with reasonable confidence. For example the excellent quality reservoirs encountered in Dondu 1, core 1 have a characteristic response on wireline logs with uncored good to excellent deliverability gas/condensate bearing sandstones in Yolla 1.

9) Analysis of the cores in the Pelican Field area suggests a predictive potential for sand body geometry and elongation. The fluvial channels would be dip oriented to the northwest, while the beach-barrier systems would be strike-oriented southwest to northeast.

10) There is marked contrast between the sedimentary facies of the *M.diversus* palynological zone found in the Cormorant and Pelican Troughs. In the Cormorant Trough, low energy lacustrine and lagoonal mudrock facies dominate, whilst in the Pelican Trough the facies are sandier and comprise fluvial, interdistributary and shoreface facies.

11) The core facies data alone represent only a small part of the section penetrated in the Bass Basin and further studies are required to interpret facies distributions using wireline log cross-sections, seismic data, regional isopach data, and structural models.

12) The relatively low well density in the Bass Basin means that it is likely that many facies variations are present which have not yet been identified or even drilled. Allowance for these variations should be considered when predicting

facies trends. For example, the extensive lacustrine units of the Cormorant Trough may pass into prospective undrilled lake shoreline sequences towards the margins of the trough.

Baillie and Bacon (1989) examined the sedimentology of the Eocene part of the EVCM. This study involved an integrated sedimentological study utilising core analysis, log analysis, palynology, coal maceral, and geochemical studies. Baillie and Bacon (1989) favour a tide-dominated deltaic environment of deposition for the upper EVCM, consisting of a complex mixture of distributary channels, strandline sandbars, peat swamps and shallow lagoons.

Baillie *et al* (1991) addressed the sedimentological and diagenetic controls on reservoir quality of the lower EVCM (defined in their paper as below the top of the lower *M.diversus* palynological zone). The conclusions of this study were:

1) Thick, permeable reservoir sands, with good deliverability characteristics, are developed in the Bass Basin and occur as often stacked, shoreline facies. These sands probably have significant lateral continuity and are best developed in the northern part of the basin.
2) Other regions with good potential for thicker development of reservoir sands are in the southern sector of the basin where upper delta plain stacked point-bar sequences could be expected to occur.
3) Due to the combined effects of deposition and diagenesis, most of the fine-grained sandstones and siltstones examined have poor reservoir characteristics, with much of their porosity occurring as micro-porosity.
4) Petrological analysis indicates that the cleaner quartzose sands with good reservoir characteristics are still preserved in deeper parts of the basin, closer to oil-mature source rocks.
5) Finding clean sand bodies of suitable size and geometry at depth is the major challenge for future explorers.

Zampatti (1991) undertook a diagenetic study of the EVCM sediments and documented two phases of silica cementation relating the late phase to cementation at elevated temperatures (above 80-90°C). Zampatti (1991) also showed that the carbonate cement was related to the supply of carbon by the breakdown of organic matter. The study established the following broad diagetic sequence.

1) Siderite deposition/formation
2) Early silica cementation
3) Carbonate dissolution, feldspar dissolution
4) Late silica cementation, kaolin formation

The work of Zampatti (1991) was expanded upon by Cubitt (1992) who refined the diagenetic paragenesis to:-

1) Early siderite cement
2) Early silica cement
3) Kaolinite development
4) Siderite and Kaolin dissolution
5) Dolomite and Ankerite cements (coarse to medium grained sediments)
6) Lillite formation
7) Secondary silica cementation
8) Organic acids dissolving fractures in rock

7.4 New Studies

7.4.1 Introduction

In this report the results of new reservoir studies designed to determine if there are any observations about reservoir quality which can be used as predictive exploration tools are presented.

Subjects addressed include observations on log derived porosity verses depth profiles, an analysis of core derived porosity and permeability data, and an analysis of gross and net sand ratios determined from wireline data.

7.4.2 Porosity versus depth

Porosity versus depth plots (Appendix 2) were created for all wells in the study area to determine what relationships exist between porosity and depth so that predictive models of good porosity distribution can be determined.

The plots were created from wireline derived sonic porosities using the simple Wyllie equation. A gamma ray filter was applied to the data so that only the cleanest (<30 API) and therefore the highest porosity values were plotted.

The porosity verses depth graphs show that in nearly all wells there is a clear linear trend showing a uniform and gradual reduction in porosity with increased depth. Two variations from this simple trend are observed. The first occurs at Tilana 1 where an igneous intrusive has reduced the porosity of some sandstones by increasing diagenetic porosity reducing processes. The second deviation from this trend is best shown in the results from Pelican 5 in which over-pressured sediments were encountered below the top of the Palaeocene section (below top of Unit 5 of this report). In the over-pressured sediments there is an improvement in the log derived porosity such that at the boundary between the overlying normally pressured sediments there is an abrupt increase in porosity of approximately five percentage units.

A further observation is that the gradient of porosity reduction with depth in the normally pressured sediments is approximately the same in all wells except for Nangkero 1 and Poonboon 1 where there is generally better porosity than observed in the other wells at any given depth. To illustrate this a line representing the porosity depth profile in the Pelican Trough wells has been drawn on each of the graphs. Data from Poonboon 1 and Nangkero shows porosities typically 5% higher than the other wells.

In conclusion, the porosity depth plots examined in this study show that there is a clear relationship between porosity distribution and depth of burial, within Eastern View Coal Measures sandstones, which is only departed from when unusual diagenetic processes associated with igneous activity or over-

pressuring are encountered. Consequently prediction of porosity in undrilled prospects can be accomplished with reasonable confidence. An area of improved porosity occurs in the vicinity of the Poonboon 1 and Nangkero 1 wells around the north eastern corner of T/25P.

7.4.3 Core Porosity and Permeability Data

Explorers in the Bass Basin have observed that despite having good porosity sandstones in the Eastern View Coal Measures have often low permeability due largely to their relative mineralogical immaturity and subsequent permeability reducing diagenetic processes. This was particularly evident in the test results from the Pelican Field appraisal well, Pelican 5, where despite good shows, good visual and log derived porosity, production testing failed to establish commercial flow rates due to poor permeability reservoirs.

Whilst permeability can be inferred from wireline logs by analysis of the caliper logs for mud cake development over permeable sandstones and separation of resistivity curves, measurements from core offer the only direct method of quantifying permeability and studying its distribution.

A compilation of all available open file core plug porosity and permeability data was made. These data were then input in the Terrastation database so that manipulation and displays of the data could be performed. In total 733 porosity-permeability analyses were used.

A porosity-permeability crossplot of all the data from the Bass Basin shows a broad scatter of data showing a log normal reduction in permeability with reduced porosity. The degree of scatter in the data is such that for a given porosity, permeability cannot be predicted with confidence. It was therefore necessary to devise subsets of the data to examine which other controlling factors affect the relationship between porosity and permeability.

The factors addressed in this study are: age and depositional facies.

7.4.4 Sediment Age

Porosity-permeability data were available from the following palynological zones:

middle *N.asperus*
lower *N.asperus*
P.asperopolus
upper *M.diversus*
middle *M.diversus*
lower *M.diversus*
upper *L.balmei*
lower *L.balmei*

Observations based on porosity permeability cross plots for each of these zones (Appendix 3) are as follows:

Middle *N.asperus*

There is only a limited data set available for this zone, derived from three wells; Toolka 1, Cormorant 1 and Bass 3, however a very good straight line fit to the data is shown.

Lower *N.asperus*

Again only a small amount of data is available for this zone, however there is a large amount of scatter in the data indicating that another factor is controlling the relationship between porosity and permeability.

P.asperopolus

The *P.asperopolus* zone is also poorly sampled although the limited data gives a relatively good fit with a similar gradient to that obtained for the middle N asperus zone.

Upper *M.diversus*

Data from the *M.diversus* zone from several wells provides a good fit to a straight line relationship for a lognormal plot of permeability verses porosity.

Middle *M.diversus*

The middle *M.diversus* zone is well sampled from a number of widely spaced wells and shows that there is little scatter about a straight line fit. The data show that middle *M.diversus* reservoirs require a porosity of greater than approximately 15% before greater than 1 md of permeability is attained. At a porosity of 18% the expected permeability is 30 md increasing to 1000md at a porosity of approximately 22%. It is notable that this permeability verses porosity decline is steeper than that observed in the younger intervals.

Lower *M.diversus*

The lower *M.diversus* zone is also well sampled from a widely spaced series of wells, however in contrast to the middle *M.diversus* zone results the data is widely scattered. It is concluded that other variables are imprinted on the data, such as depositional facies or diagenesis. Therefore the relationship of permeability to porosity cannot be predicted for sandstones of this age without reference to these variables.

Upper *L.balmei*

The upper *L.balmei* zone is well sampled however the data, like those of the lower *M.diversus* zone, do not show a simple linear trend making prediction of permeability difficult.

Lower *L.balmei*

Data from the lower *L.balmei* zone show a similar broad spread of porosity and permeability to those recorded in the upper *L.balmei* zone.

In conclusion the plots of porosity verses permeability for different ages of sediments show that in general the younger aged sediments post-lower *M.diversus* give relatively good log normal straight line relationships. Older sediments including those in the more prospective *M.diversus* and *L.balmei* palynological zones show wide variation.

7.4.5 Depositional Facies

A third suite of crossplots (Figure 7.1 and Appendix 4) were produced by sorting the porosity-permeability data into five facies associations:

Overbank facies
Shoreface facies
Fluvial channel facies
Lagoonal delta facies
Shallow subaqueous sandsheets

The facies associations were assigned using the core facies logs documented in Suttill *et al* (1987).

Overbank facies

This association includes the following depositional facies; lacustrine fill, crevasse splays, levee deposits, and channel abandonment plugs. The porosity-permeability cross plot shows a relatively broad scatter of data for this association as would be expected from the relatively low energy environment poorly sorted sediments that are represented.

Shoreface facies

The following depositional facies are represented by the shoreface facies association; beach - backwash - swash zone. This association represents relatively high energy sedimentation in which the sediments are well sorted and

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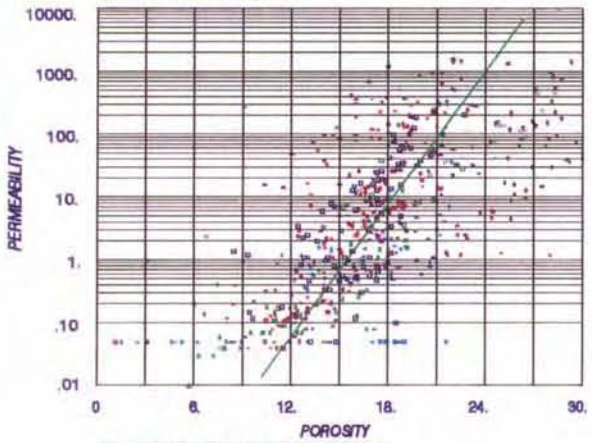
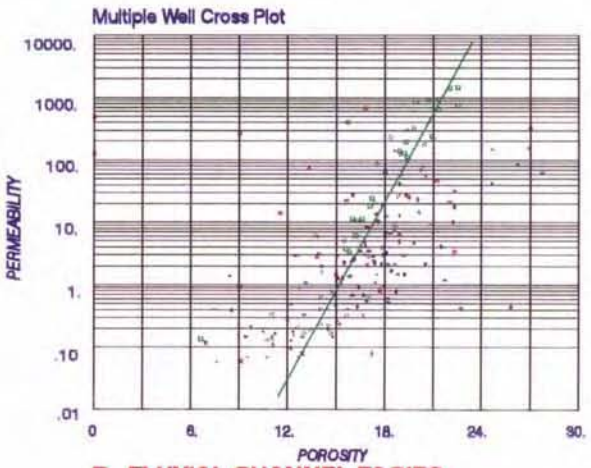
A. ALL EASTERN VIEW COAL MEASURES DATA

Multiple Well Cross Plot



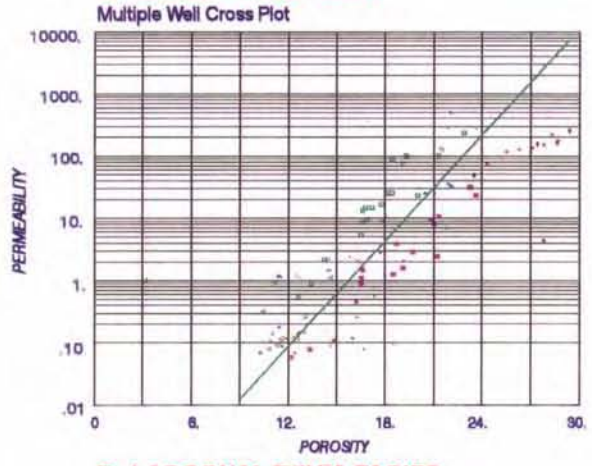
B. OVERBANK FACIES

Multiple Well Cross Plot



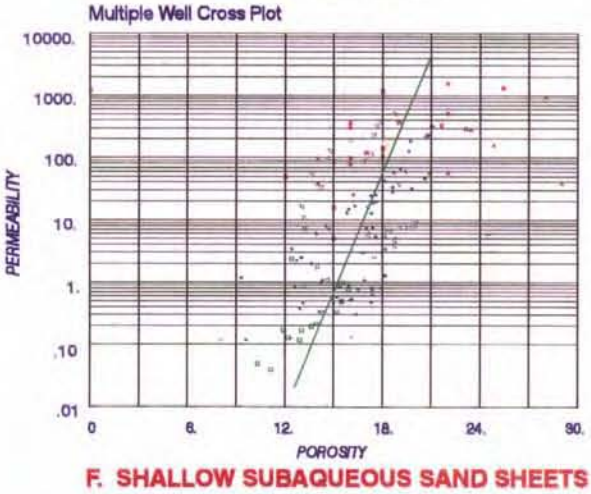
C. SHORE FACE FACIES

Multiple Well Cross Plot



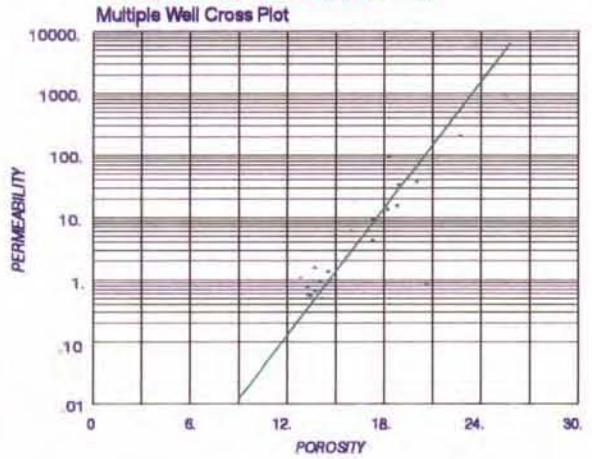
D. FLUVIAL CHANNEL FACIES

Multiple Well Cross Plot



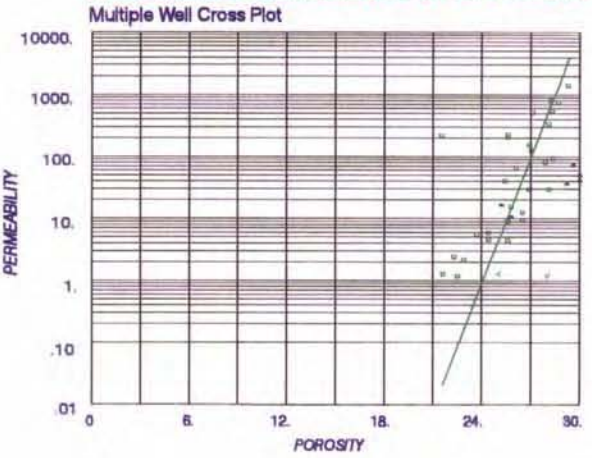
E. LAGOONAL DELTA FACIES

Multiple Well Cross Plot



F. SHALLOW SUBAQUEOUS SAND SHEETS

Multiple Well Cross Plot



LEGEND

WELL NAME		WELL NAME	
BASS 1	○	PELICAN 5 ★	▫
AROO 1	·	PIPIPA 1 ★	+
BASS 2	×	POONBOON 1 ★	×
CORMORANT 1	△	TAROOK 1	·
DURROON 1	□	TILANA 1	□
NANGERO 1 ★	◇	TOOLKA 1A	◇
NARIMBA 1 ★	△	YOLLA 1	▲
PELICAN 1 ★	▒	YURONGI 1	■
PELICAN 2 ★	◇	BASS 3	♦
PELICAN 3 ★	‡	DONDU 1	‡
PELICAN 4 ★	‡	★ T/25P	

BASS BASIN - TASMANIA

T/25P

POROSITY VERSES PERMEABILITY EFFECT OF DEPOSITIONAL FACIES

FIG. 7.1

RST25P11.PRS

5 cm

have probably attained good mineralogical maturity (are more quartzose). Consequently, it is not surprising that a good log normal relationship between permeability and porosity is observed.

Fluvial channel facies

The fluvial channel facies association includes; inchannel deposits, barforms and point bar deposits. This association also represents relatively high energy deposition in a predominantly unidirectional flow pattern. A moderate to good log normal relationship between permeability and porosity is observed, with the observed scatter being probably due to depth of burial and diagenetic processes. The gradient of the best fit porosity-permeability curve is observed to be steeper than that of the shoreface facies samples. The shoreface facies exhibit higher maximum measured porosities than the fluvial sediments, although both have similarly highest maximum measured permeabilities of approximately 1000md. However as porosity reduces to approximately 12-13% both the shoreface and fluvial sediments have permeabilities of only 0.1md.

Lagoonal delta facies

The lagoonal delta facies association is represented by typically upward coarsening sequences of sediments deposited in progradational lacustrine deltas, examples occur at Pelican 5, core 1 and Cormorant 1, core 13. Many of the sediments are wave-rippled indicating near shore deposition. A very good log normal relationship between permeability and porosity is observed despite a small number of measurements. The slope of the curve is very similar to that observed for the shoreface facies association.

Shallow subaqueous sandsheets

Shallow water subaqueous sandsheets were deposited in a transgressive pro-delta setting at the top of the Eastern View Coal Measures and examples are represented in core from Cormorant 1, cores 3 and 4, Bass 3, core 6 and

Yolla 1, core 1. There is a well defined lognormal relationship between the permeability and porosity measurements, indicating good predicability of reservoir quality for this facies association. The porosity-permeability gradient is steep, with a similar gradient to the fluvial facies association but higher porosities are required for a given permeability.

In conclusion there is a good relationship between depositional facies and core derived porosity and permeability data, such that it is likely that depositional facies forms the significant overprint on the scatter seen in the depth and sediment age plots.

The best quality reservoirs are preserved in shoreface, lagoonal delta and fluvial facies associations. Shallow subaqueous sandsheet sandstones despite having initial good reservoir quality lose permeability rapidly as porosity is reduced.

7.4.6 Reservoir Distribution

The objective of this study is to document the distribution of gross and net sandstone within the Eastern View Coal Measures. The data were compiled from the Terrastation database described earlier and relies entirely on wireline data.

Gross sandstone was generally determined using a gamma ray range of 0 - 75 API, however this range was modified where high mud weight and/or mud log data suggested that the range was incorrect. The smallest range used in such zones was for gamma ray values of 0 - 60 API. Differentiation between the very fine grained sandstones and siltstones observed in many parts of the EVCM results in some difficulties with tying to reconcile the mudlog data with gamma ray cutoff values. A further lithology discriminator was used to exclude coals and igneous extrusives and intrusives.

Net sandstone values were determined from the gross sandstone by further removing all sandstone with a Wyllie porosity of less than 18%. As described

in the previous section permeability is affected by depth of burial, diagenesis, and depositional facies, therefore a simple porosity cutoff may not be equally appropriate for all sandstones. For this reason maps showing net sandstone are useful for establishing regional trends but must be used with reference to these other factors.

Table 7.1 shows the gross and net sandstone thickness in each of the upper five units of the EVCM, Table 7.2 shows the net sandstone as a percentage of gross sandstone in each unit and Table 7.3 shows the percentage of gross to net sandstone in each unit.

Nearly all wells show a gradual reduction in gross and therefore also net sand content with depth. In Units 1, 2 and 3 over 90% of the gross sand is net sand, with the exception of Tilana 1 and Yolla 1 located outside T/25P.

Unit 4 (the hydrocarbon zone in the Pelican Field) shows the greatest regional variation in the distribution of gross and net sandstone. Figure 7.2 shows a map of the regional variation in the percentage of gross to net sandstone. The map shows that in the Pelican Trough the percentage of net sandstone has reduced to 30-60% whilst on the margin of the trough at Flinders 1 more net sandstone (85.4%) is preserved reflecting better reservoir quality at shallower depths of burial. In the north eastern corner of the permit large amounts of net sandstone (92.4- 99.1% of gross sandstone) are preserved as shown by Poonboon 1, Nangkero 1 and Dondu 1.

Figure 7.3 shows the percentage thickness of net sand to the gross thickness of Unit 4. The trends shown by this map are similar to those seen in Figure 7.2.

Unit 5 (hydrocarbon bearing at Pelican 5 but tight and hydrocarbon bearing with good deliverability at Yolla 1) has only been completely penetrated by two wells in T/25P, Pelican 5 and Poonboon 1. Flinders 1 and Pelican 3 also penetrated significant thicknesses of Unit 5.

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TABLE 7.1

GROSS/NET SAND (M) EASTERN VIEW COAL MEASURES

	UNIT 1		UNIT 2		UNIT 3		UNIT 4		UNIT 5	
	GROSS	NET	GROSS	NET	GROSS	NET	GROSS	NET	GROSS	NET
Flinders 1	135.4	131.40	110.3	107.60	75.8	73.9	92.5	79.0	NP	NP
Pipipa 1	83.95	81.21	70.24	69.32	25.29	24.38	NP	NP	NP	NP
Pelican 4	145.24	142.19	107.9	105.92	67.82	64.16	159.72	110.34	NP	NP
Pelican 5	140.42	138.59	123.51	122.60	75.54	73.41	247.79	129.30	256.47	52.54
Pelican 1	193.09	189.13	166.27	163.37	105.92	104.7	117.80	76.35	NP	NP
Pelican 2	183.79	180.44	117.65	115.98	92.05	85.95	251.92	85.95	NP	NP
Narimba 1	133.96	132.74	69.34	68.89	102.41	101.80	169.62	80.62	NP	NP
Pelican 3	116.13	No sonic	22.40	No sonic	32.61	No sonic	53.03	No sonic	NP	NP
Poonboon 1	99.06	98.15	16.61	16.46	18.59	18.59	52.58	52.12	220.52	174.95
Nangkero 1	115.98	114.30	38.56	37.64	13.41	13.41	78.64	72.70	NP	NP
Dondu 1	187.15	184.71	73.0*	72.69*	-	-	104.09	102.41	331.17	183.49
Tilana 1	95.40	83.97	64.47*	40.23*	-	-	68.58	44.35	232.72	85.65
Yolla 1	220.52	213.06	76.20*	60.81*	-	-	53.95	26.67	NP	NP

Notes: Net sand defined as sand having $\phi dt \geq 18\%$

NP Not penetrated or not completely penetrated

* Units 2 and 3 combined

TABLE 7.2

NET SAND (% OF GROSS SAND)

	UNIT 1	UNIT 2	UNIT 3	UNIT 4	UNIT 5
Flinders 1	97.0	97.5	97.5	85.4	-
Pipipa 1	96.7	98.7	96.4	-	-
Pelican 4	97.9	98.2	94.6	69.1	-
Pelican 5	98.7	99.3	97.2	52.2	20.5
Pelican 1	97.9	98.3	98.8	64.8	-
Pelican 2	98.2	98.6	93.4	34.1	-
Narimba 1	99.1	99.4	99.4	47.5	-
Pelican 3	-	-	-	-	-
Poonboon 1	99.1	99.1	100.0	99.1	79.3
Nangkero 1	98.6	97.6	100.0	92.4	-
Dondu 1	98.7	99.6		98.4	55.4
Tilana 1	88.0	62.4		64.6	27.2
Yolla 1	96.6	79.8		49.4	-

Notes: NP interval not penetrated or not completely penetrated.

* Units 2 and 3 combined

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TABLE 7.3

GROSS/NET SAND (%) EASTERN VIEW COAL MEASURES

	UNIT 1		UNIT 2		UNIT 3		UNIT 4		UNIT 5	
	GROSS	NET	GROSS	NET	GROSS	NET	GROSS	NET	GROSS	NET
Flinders 1	61.1	59.3	52.5	51.1	47.4	46.2	28.7	24.6	NP	NP
Pipipa 1	33.5	32.4	31.5	31.1	14.6	14.2	NP	NP	NP	NP
Pelican 4	55.9	54.7	41.8	41.1	38.5	36.5	29.7	20.5	NP	NP
Pelican 5	56.2	55.5	45.6	45.2	41.7	40.5	37.5	19.6	64.0	13.1
Pelican 1	76.0	74.5	63.2	62.0	60.4	59.7	16.8	10.9	NP	NP
Pelican 2	70.4	69.2	41.2	40.7	50.3	49.3	37.1	12.6	NP	NP
Narimba 1	53.4	52.3	24.0	23.8	50.0	49.7	19.1	9.0	NP	NP
Pelican 3	45.0	No sonic	20.0	No sonic	29.1	No sonic	41.5	No sonic	NP	NP
Poonboon 1	35.9	35.5	12.3	12.2	22.5	22.5	18.9	18.8	38.1	30.2
Nangkero 1	43.0	42.4	36.4	35.6	10.8	10.8	22.3	20.6	NP	NP
Dondu 1	69.7	68.8	38.5*	38.3*	-	-	37.2	36.6	67.2	37.2
Tilana 1	29.0	25.6	12.9*	8.1*	-	-	21.9	14.2	28.8	10.6
Yolla 1	65.8	63.6	23.4*	18.7*	-	-	15.8	7.8	NP	NP

Notes: Net sand defined as sand having $\phi dt \geq 18\%$

NP Not penetrated or not completely penetrated

* Units 2 and 3 combined

491104

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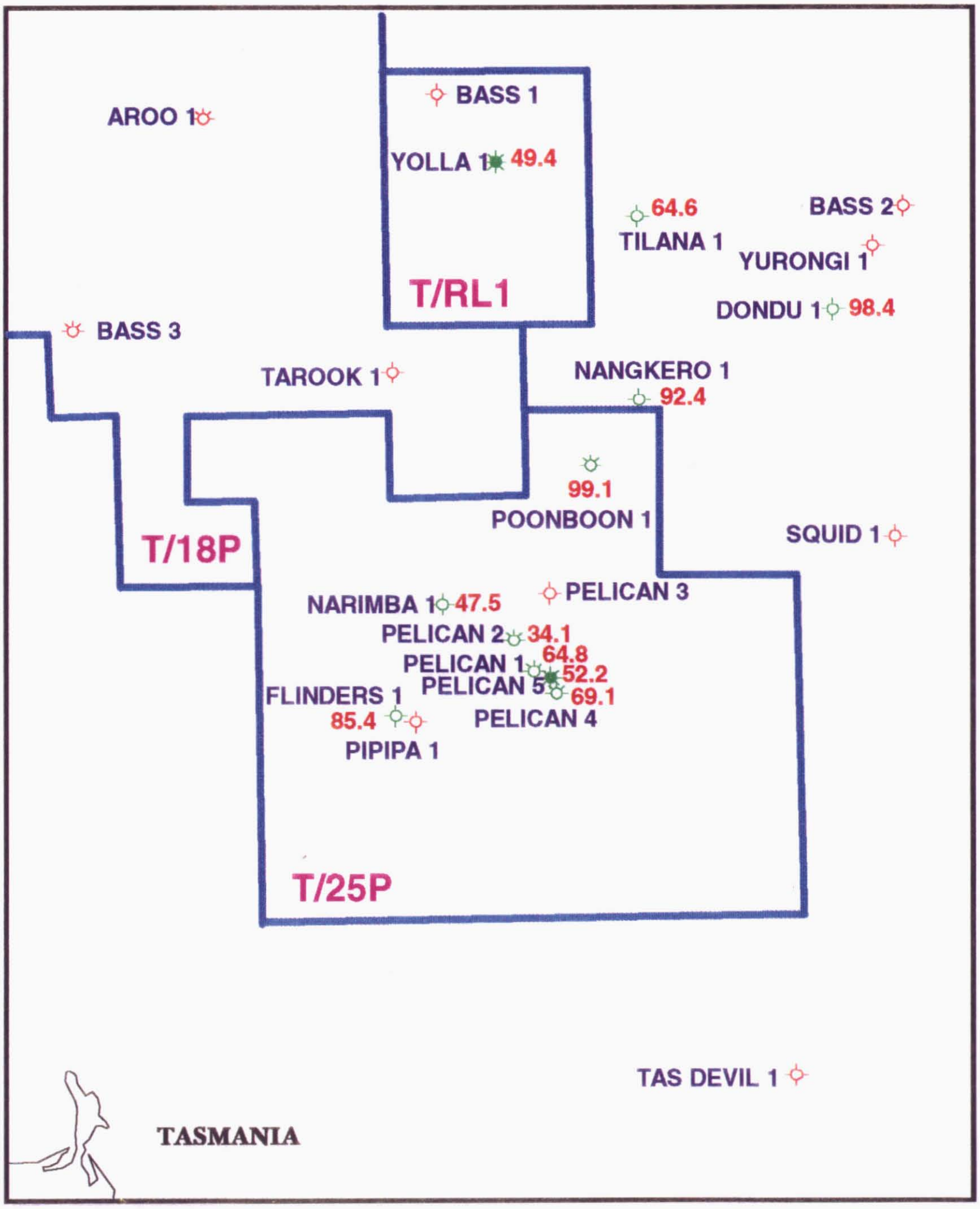

BASS BASIN - TASMANIA

T/25P

UNIT 4 NET :
GROSS SAND (%)

FIG. 7.2

RSTCM11.PRS

5 cm

491105

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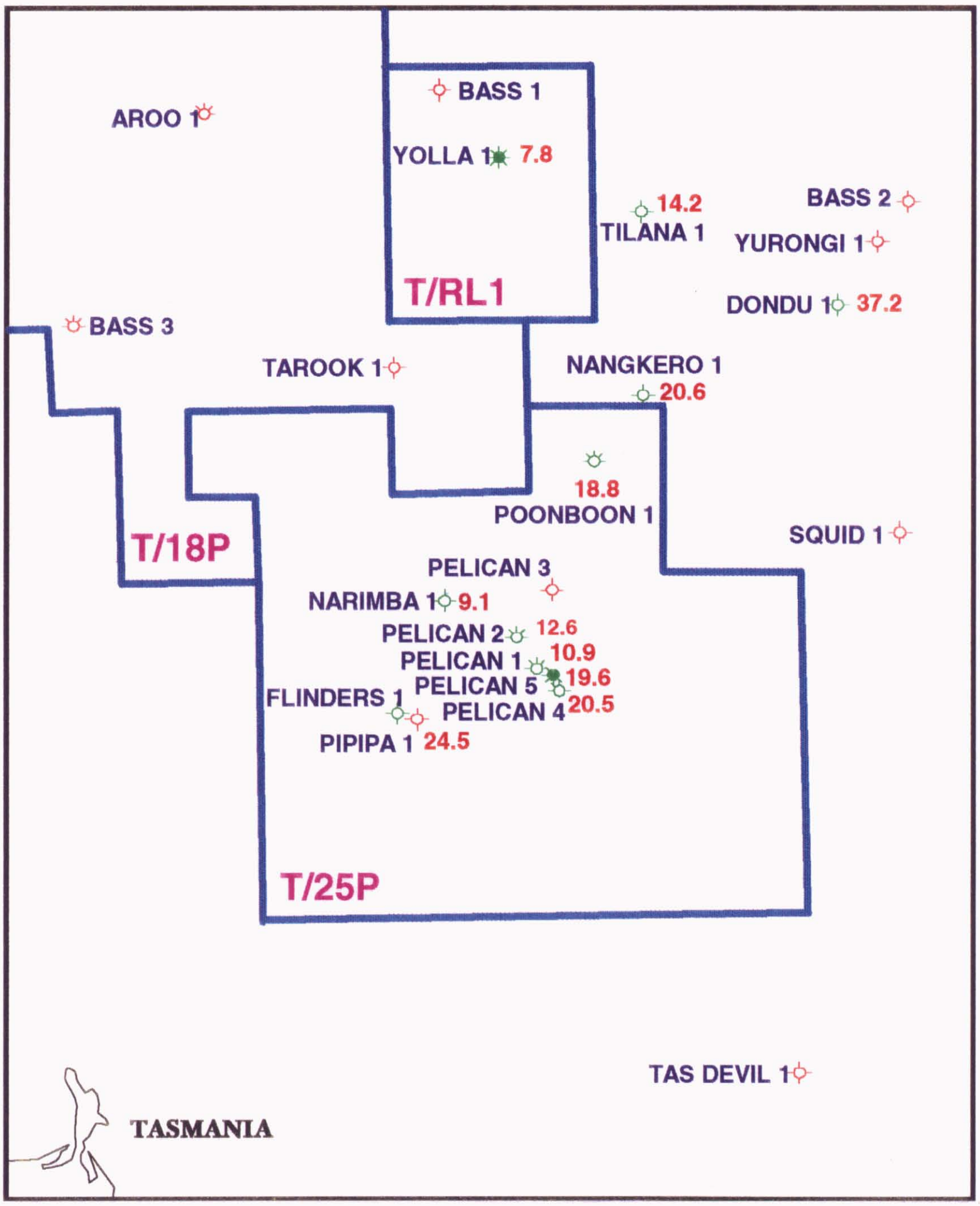
Resources Ltd.



BASS BASIN - TASMANIA

T/25P

UNIT 4 NET SAND : GROSS THICKNESS (%)

FIG.7.3

RSTCM11.PRS

5 cm

From the sparse data (Figures 7.4 and 7.5) it appears that the net to gross sand percentage follows a similar regional pattern to that encountered in Unit 4, with the highest percentage of net sand occurring in the northeast of T/25P and along the south western margin of the Pelican Trough.

Unit 6 has only been partially penetrated in the centre of the Pelican Trough at Pelican 5 where reservoir quality was poor and at Poonboon 1 where only a few meters of section were drilled. Regional variation in the quality of Unit 6 is therefore poorly known.

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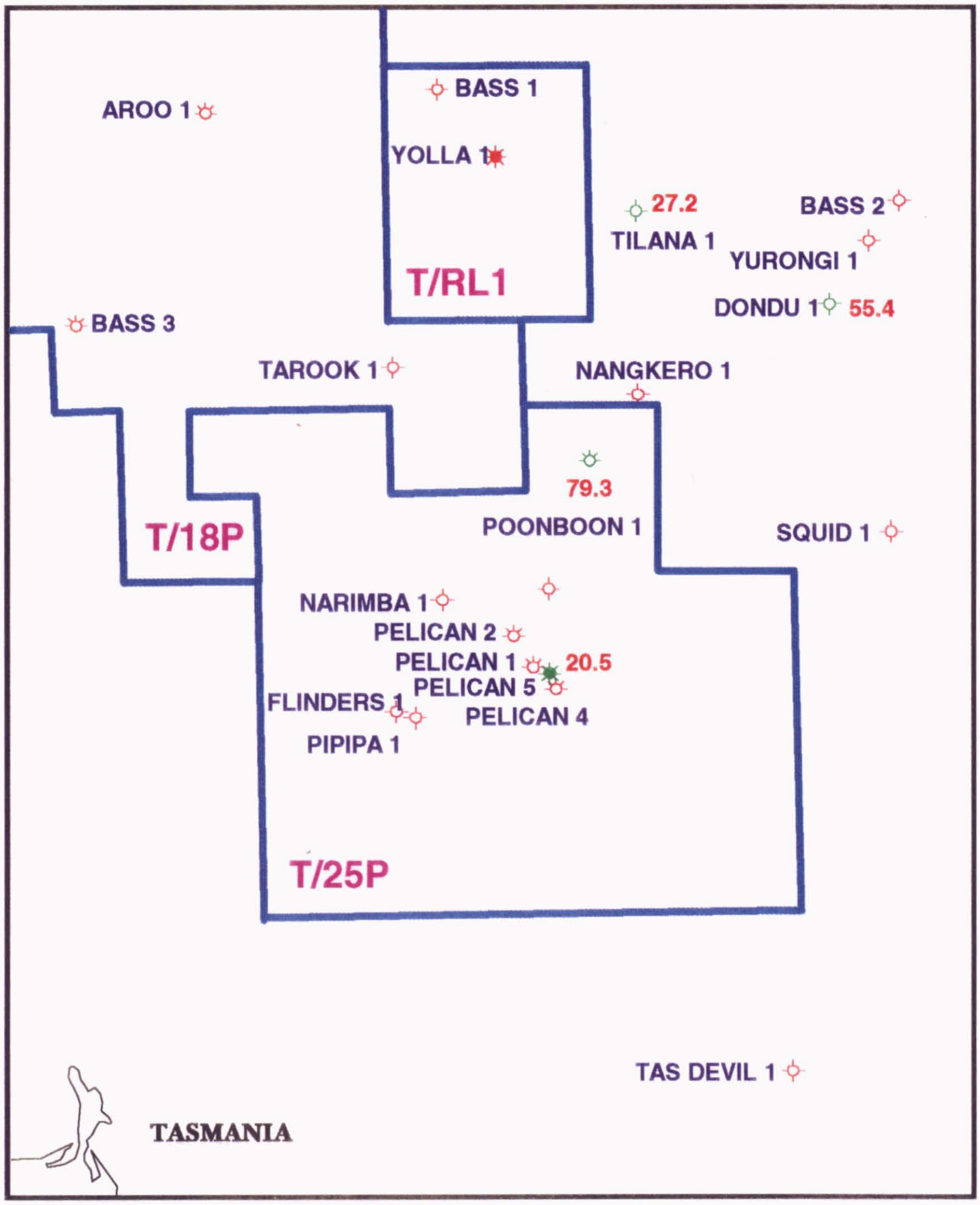

BASS BASIN - TASMANIA

T/25P

UNIT 5 NET : GROSS SAND (%)

FIG.7.4

RSTCM11.PRS

5 cm

SAGASCO
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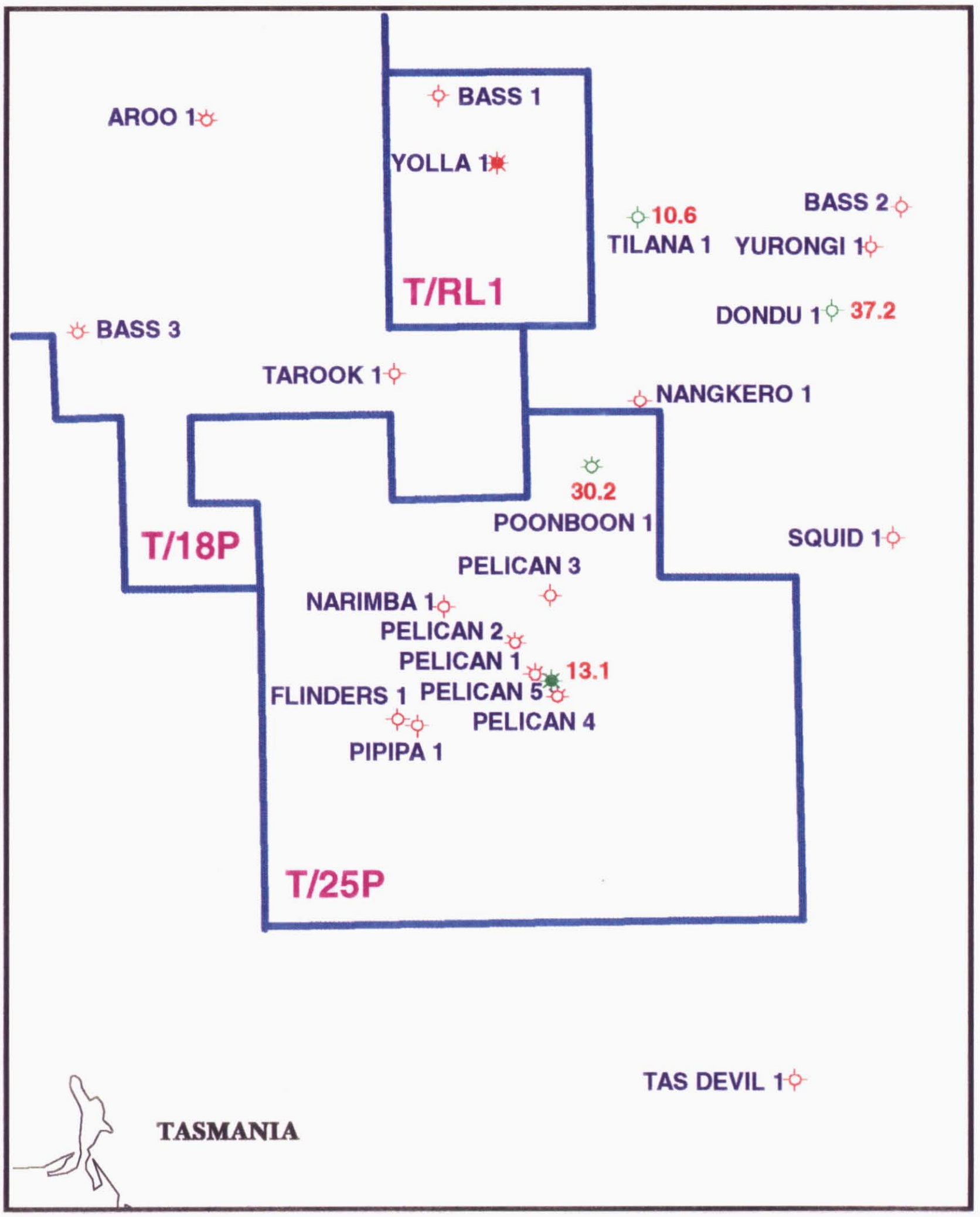

BASS BASIN - TASMANIA

T/25P

UNIT 5 NET SAND : GROSS THICKNESS (%)

FIG. 7.5

RSTCM11.PRS

5 cm

8 POTENTIAL SOURCE SEQUENCES

8.1 Source Rock Data

Eocene, Palaeocene and Cretaceous subdivisions of the EVCM have been evaluated as potential hydrocarbon source intervals. A review of existing geochemical data is presented in Sections 8.2 and 8.3. All available geochemical data for T/25P wells were used in this study, including the most recent data from Flinders 1. Data from wells in adjacent permits were also used (Koorkah 1, Yolla 1, King 1, Cormorant 1).

8.2 Source Rock Quality

The Pelican Trough has a proven gas/condensate charge as shown by the sub-commercial discovery at the Pelican Field. The deepest sediments in the centre of the Pelican Trough have not been drilled and their source potential is not known. However Pelican 5 the deepest penetration of the Pelican Trough, intersected source rocks to its total depth of 4267 metres. A condensed section is present on the flank of the Pelican Trough as seen in Flinders 1. This source rock study relies on these wells being representative of the source sediments within the study area.

A) *Total Organic Carbon Content*

Total Organic Carbon (TOC) content is used to evaluate the organic richness of sediments and those with content over 1.0% TOC are considered to be good in organic richness. Organic richness is generally excellent in the Eocene and Palaeocene and fair-to-good in the Cretaceous EVCM sediments. The high organic richness (Figures 8.1 and 8.2) is attributable to the high proportion of coals in the Eocene and Palaeocene EVCM, whilst in the Cretaceous EVCM, good organic richness is attributable to shales, carbonaceous shales and siltstones.

At Flinders 1, TOC is consistently high, partly due to the presence of coals. Consequently TOC values typically fall in the very good-to-excellent category (2 → 4%). This distribution is partly due to the absence of sidewall cores which could have selected shale and siltstone samples uncontaminated by coal.

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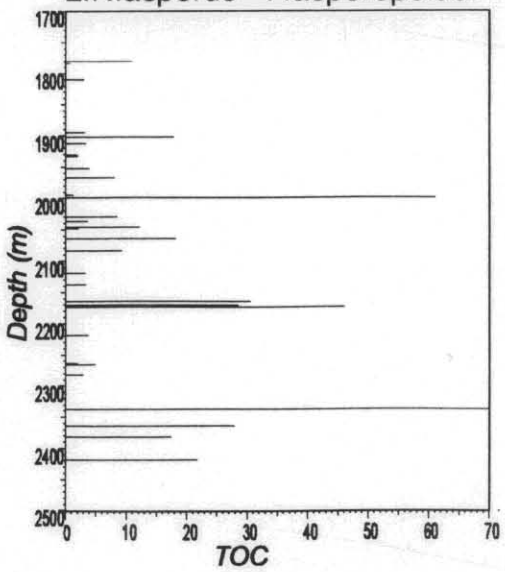
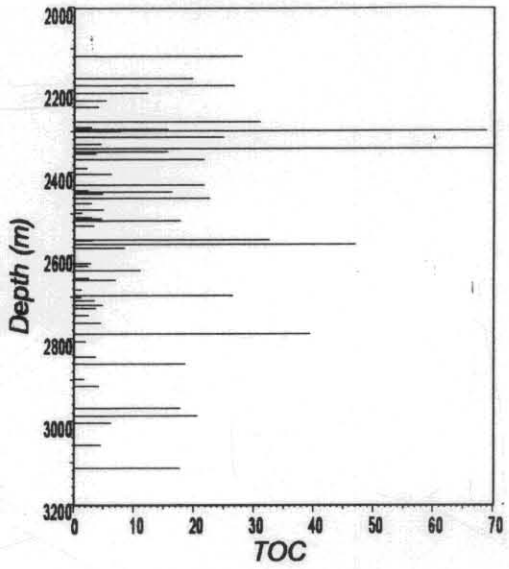
T/25P WELLS (Pelican Trough)

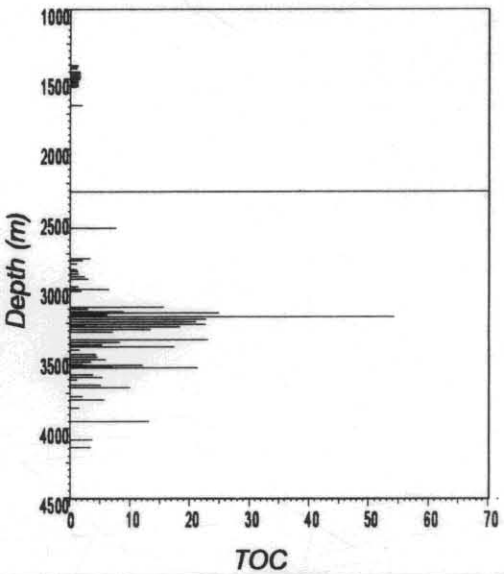
L.N.asperus - P.asperopolus



M.diversus zone

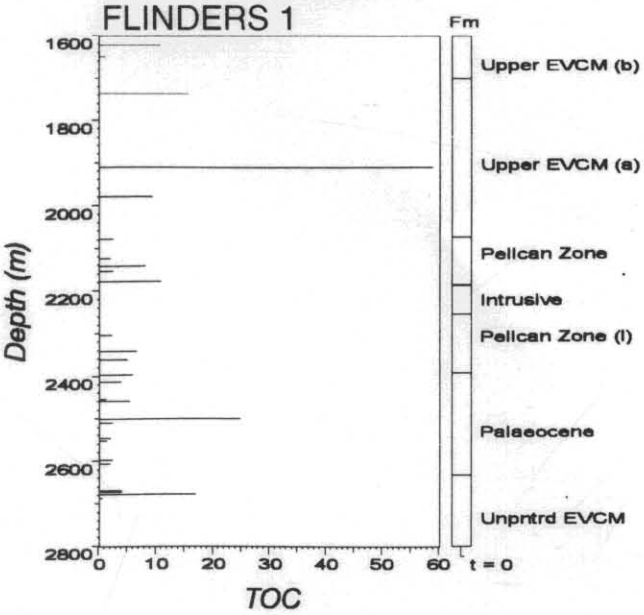


L.balmei - T.longus

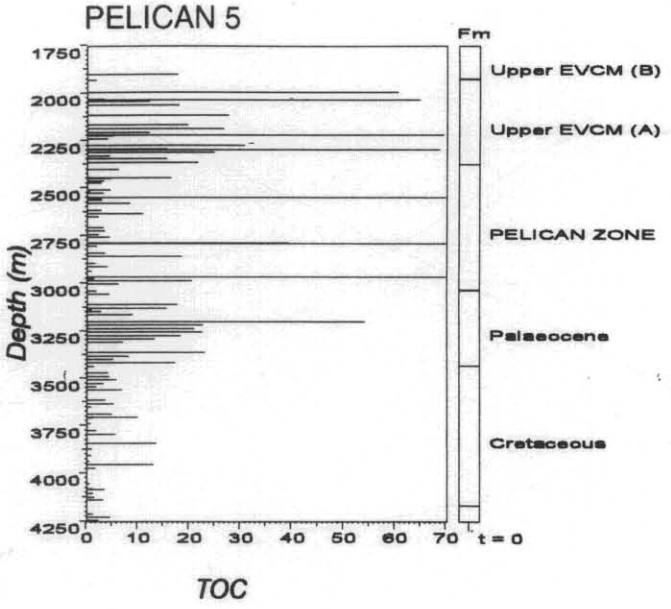


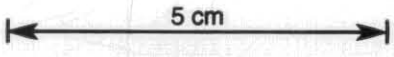
SELECTED WELLS

FLINDERS 1



PELICAN 5





BASS BASIN - TASMANIA

T/25P

ORGANIC RICHNESS TOTAL ORGANIC CARBON CONTENT T/25P WELLS PELICAN TROUGH

AMORG01.PRS Fig. 8.1

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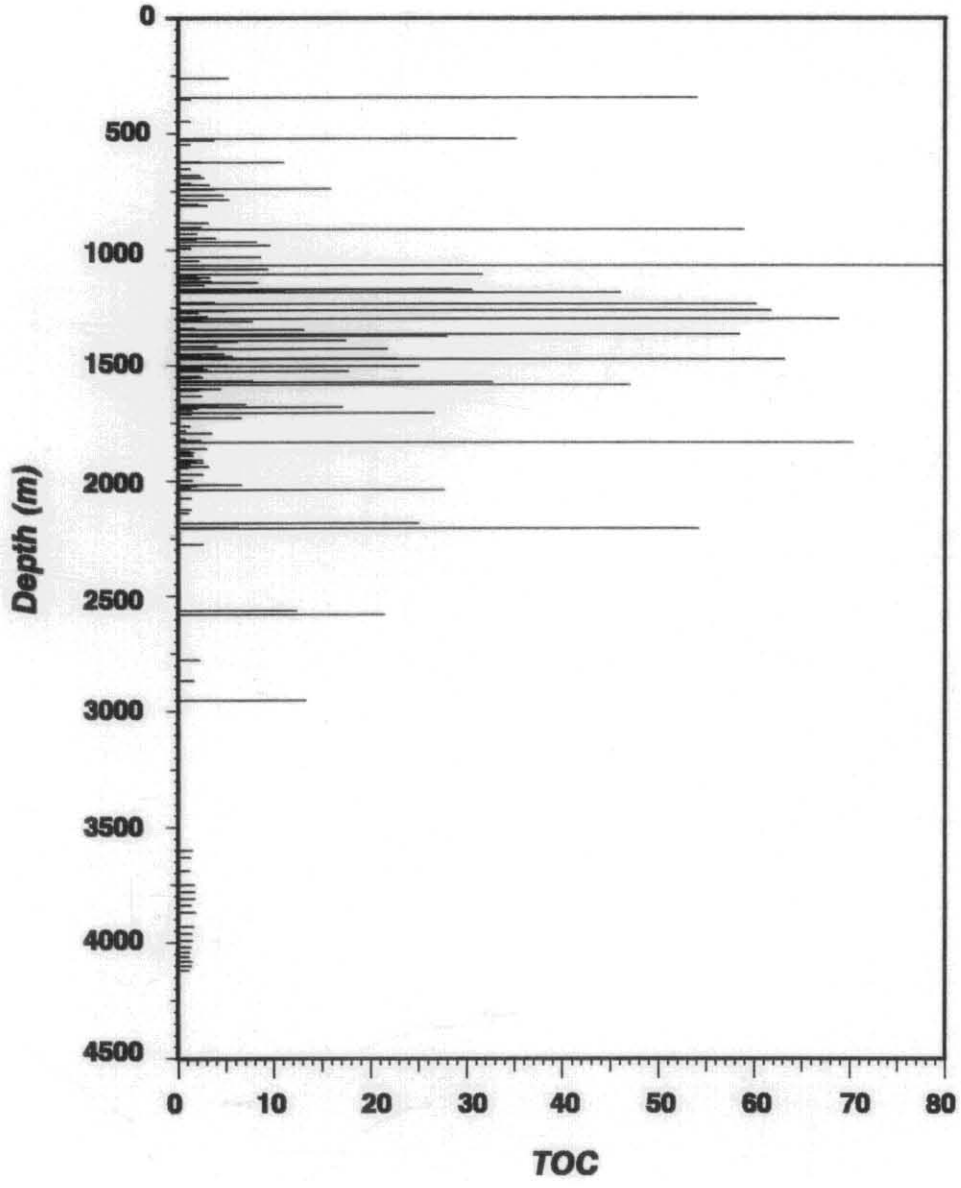

BASS BASIN - TASMANIA

T/25P

BASS BASIN TOC VALUES
(ALL WELLS)

AMKIN194.PRS Fig. 8.2

At Pelican 5, TOC values typically decrease with increasing depth through the EVCM. Analytical data are summarised and tabulated below:

	TOC	
	Range %	Mean%
Eocene	1-80	16
Paleocene	1-50	10
Cretaceous	0.8-14	3

The Eocene and Paleocene mean values, although well above average for clastic sediments, are strongly influenced by abundant coal in the sequence, as many of the values analysed were from cuttings samples.

High organic richness values are mostly due to the high amounts of exinite in coals and shales. At Pelican 5, the exinite content of coals in samples analysed (Amoco Report 1986) range from 10-40% (average 15-25%). In the siltstones and shales the exinite content is predominantly between 10-25%.

Exsudatinite commonly occurs in coals within the EVCM. The abundance of exsudatinite is an indicator of generation of significant quantities of liquid hydrocarbons from mature coals. The high liquids content of Pelican Field gas accumulations confirms this observation.

B) *S1 - Free Hydrocarbon Richness*

The Rock-Eval parameter S1 represents the fraction of the original genetic potential which has been effectively transformed into hydrocarbons. From the compiled data of all Bass Basin wells (Figure 8.3) the free hydrocarbon richness within the Eocene-Palaeocene section increases markedly with depth. The Palaeocene section in the Bass Basin generally exhibits very high S1 values, for example Pelican 5, where S1 values exceed 5 mg/g. The Cretaceous section (on limited data) exhibits fair to good S1 values (0.25-1.0 mg/g). At Flinders 1 the S1 values are fair to very good (0.20-1.60 mg/g) in the Eocene Section and locally excellent (> 1.60 mg/g) around the Palaeocene interval.

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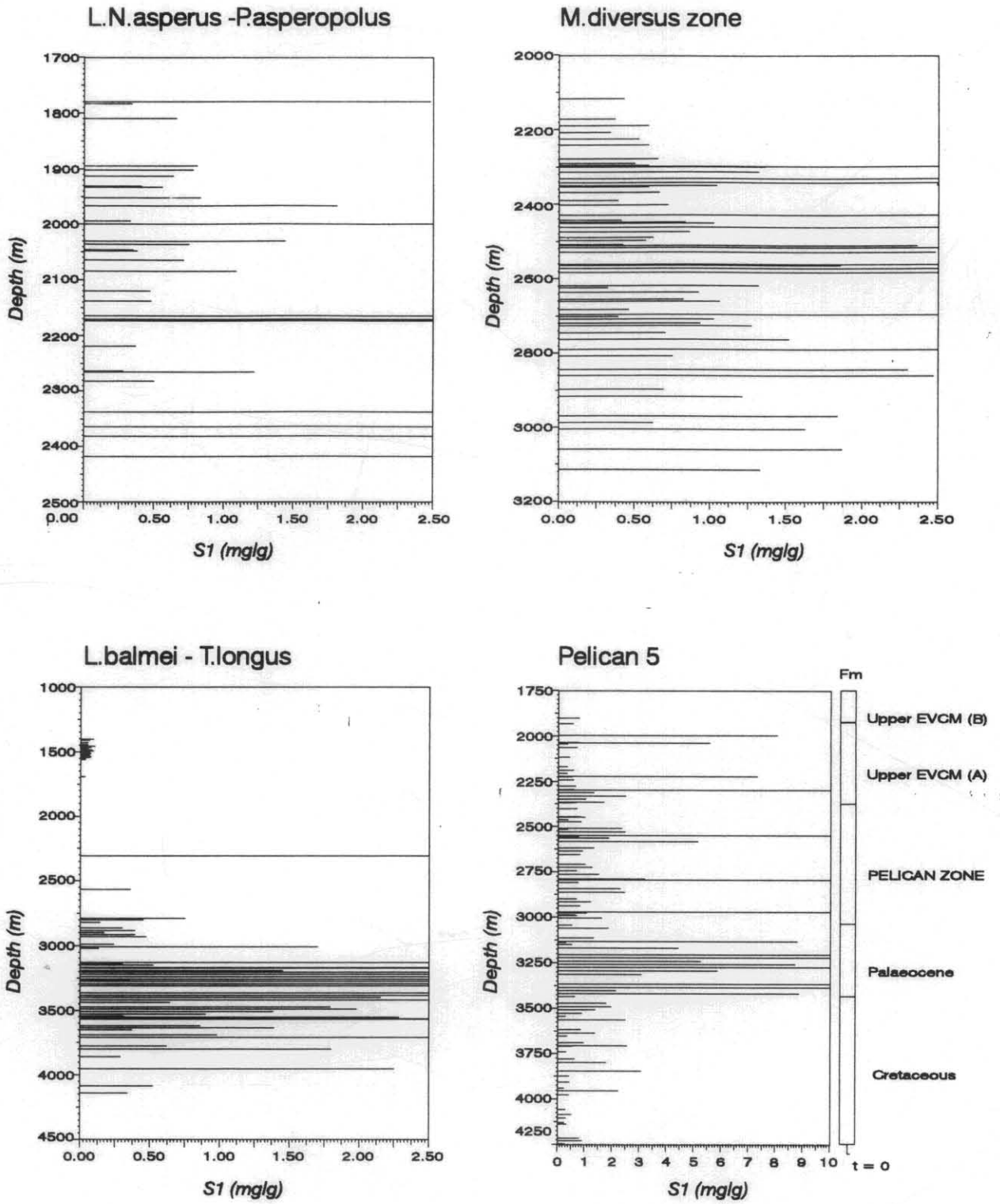

BASS BASIN - TASMANIA

T/25P

FREE HYDROCARBON RICHNESS
S1 VALUES
(PELICAN TROUGH)

AMKIN194.PRS Fig. 8.3

5 cm

C) *S2 - Oil and Gas Generating Capacity*

The quantitative parameter S2 of Rock-Eval analysis (potential yield) is used to evaluate the generating capacity of the sediments. Those having over 2.5 mg/g rock potential yield are classified as fair, between 5 mg/g rock and 10 mg/g rock as good, and greater than 10 mg/g rock as very good to excellent.

The potential yield (S2) in the Pelican Trough is estimated to be very good to excellent with S2 values commonly exceeding 10 mg/g rock (Figure 8.4). The Palaeocene section, in particular, has extremely high organic richness generating capacity with typical S2 values ranging from 10-60 mg/g. Several smaller intervals within the Eocene (Figure 8.4) commonly exhibit good to very good source richness with S2 values between 5-15 mg/g.

D) *S2/S3 Ratio: Hydrocarbon Source Potential*

The S2/S3 ratio is a quantitative measure of source potential and type. S2/S3 values greater than 5 often indicate oil source potential.

At Pelican 5 the S2/S3 ratio is generally very good (2-20) to excellent (> 20) throughout the lower Eocene to Palaeocene. These values are consistent with data from most other Bass Basin wells (Figure 8.5), which exhibit with high ratios around the *M.diversus* - Palaeocene sections. Cretaceous sediments have generally lower S2/S3 ratios, falling within the moderate to good range (2-10).

8.3 Source Rock Type

The organic geochemical character of the shaley EVCM sediments was examined from pyrolysis data with the objective of determining the proportions of kerogen types I, II and III. At Flinders 1 and Pelican 5 a very high proportion (more than 80%) of kerogen type III, characteristic of deltaic environments, is observed. Kerogen type III produces less hydrocarbons than kerogens of types I or II per unit volume (Tissot and Espitalié, 1975), but this is offset because the total organic carbon is high (> 5% for most potential source intervals). A good total organic carbon content (TOC > 10%)

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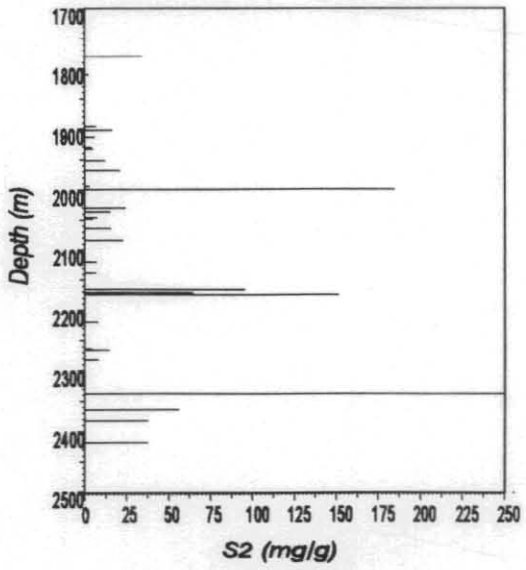
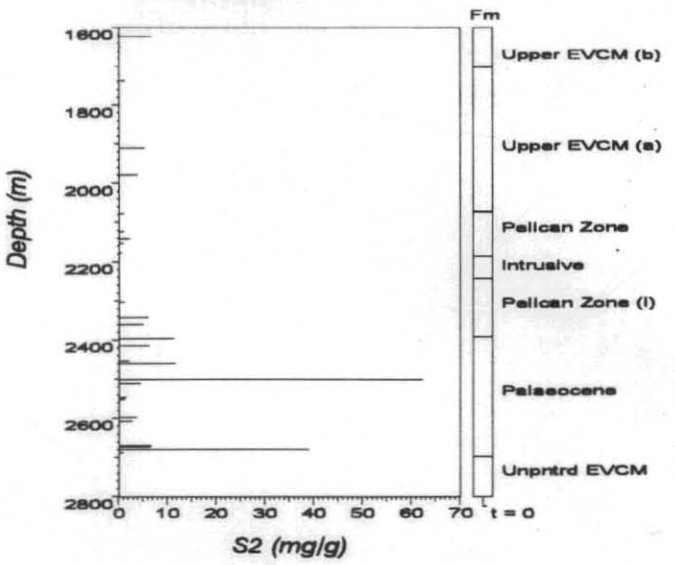
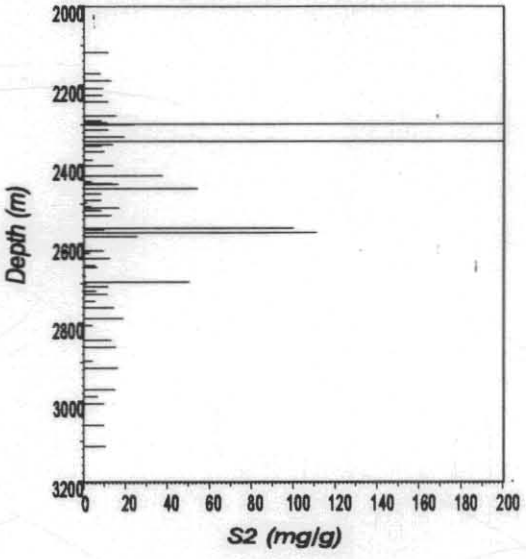
L.N.asperus - P.asperopolus



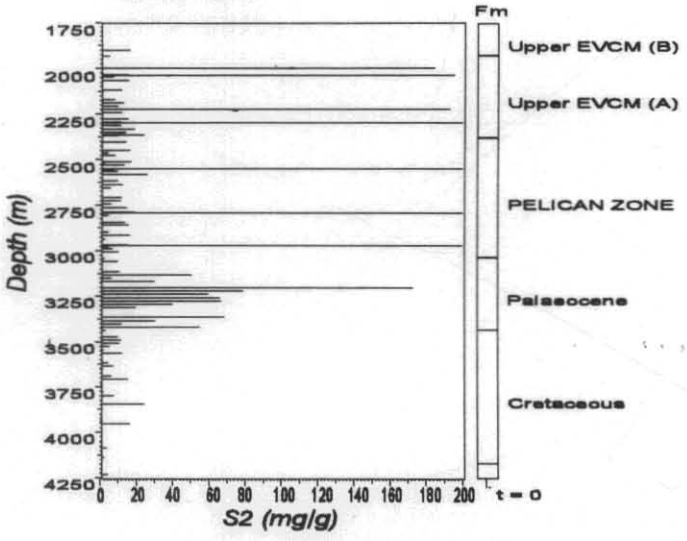
FLINDERS 1



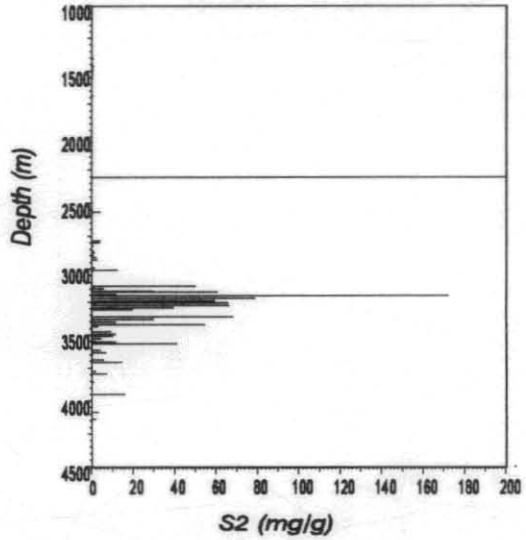
M.diversus zone



PELICAN 5



L.balmei - T.longus



BASS BASIN - TASMANIA
T/25P

ORGANIC RICHNESS
S2 VALUES
PELICAN TROUGH

5 cm

AMORG01.PRS Fig. 8.4

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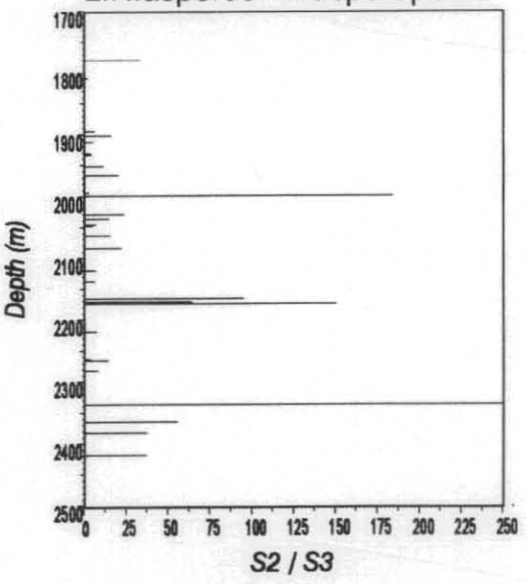
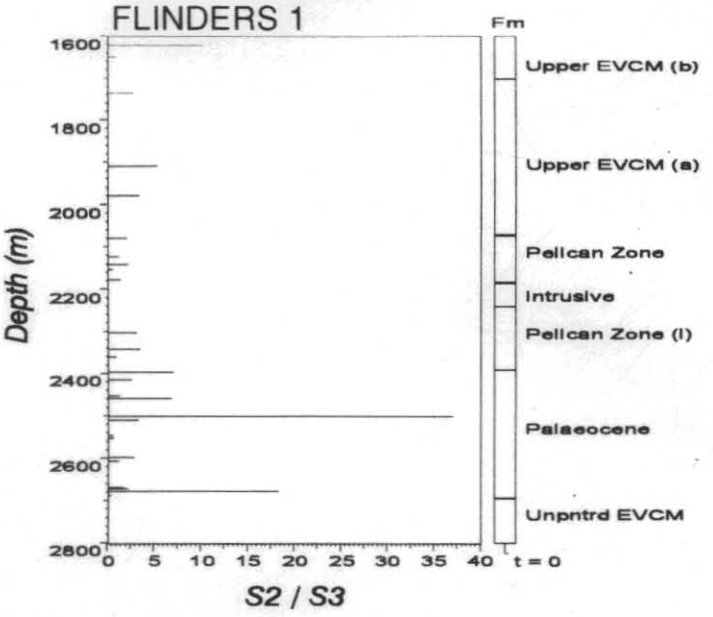
Resources Ltd.

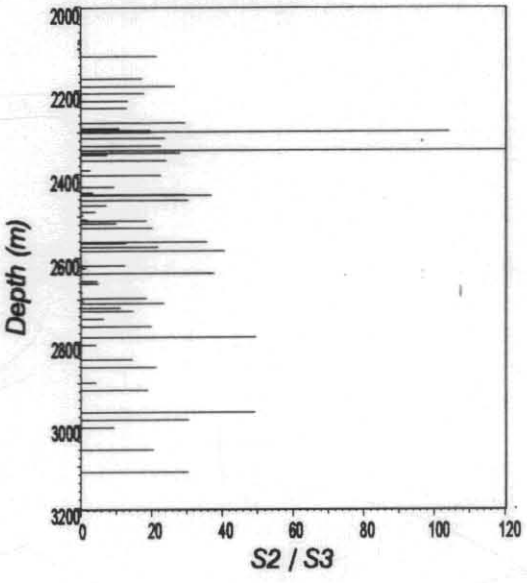
T/25P WELLS (Pelican Trough)
L.N.asperus - P.asperopolus



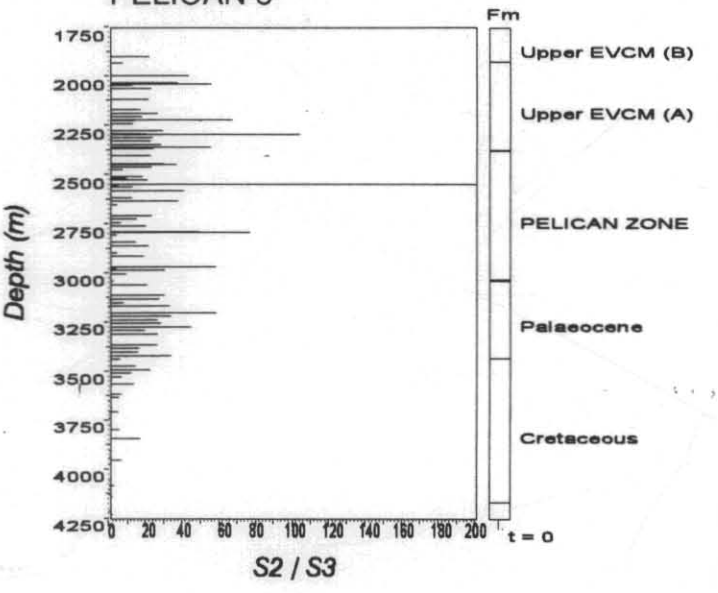
SELECTED WELLS
FLINDERS 1



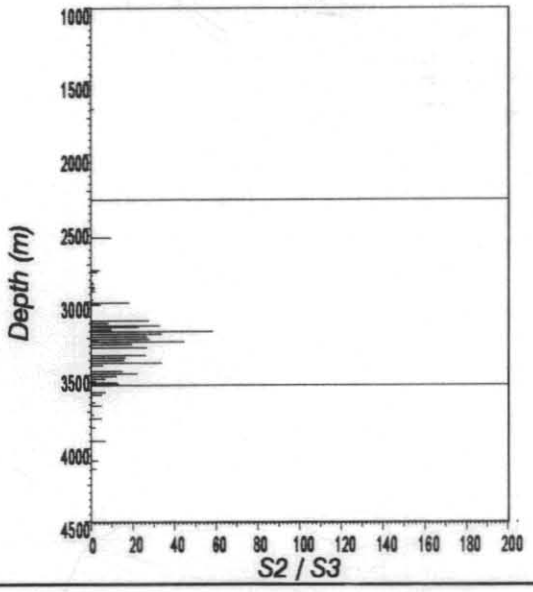
M.diversus zone



PELICAN 5



L.balmei - T.longus



BASS BASIN - TASMANIA
T/25P

HYDROCARBON SOURCE POTENTIAL - S2 / S3 RATIO PELICAN TROUGH

5 cm

AMORG01.PRS Fig. 8.5

will not be as important if the kerogen is of poor hydrocarbon source quality (woody or highly oxidised) (Waples, 1981). Fortunately, optical studies (Pelican 5 Well Completion Report and Amoco Report 1986) suggest that the organic matter present in the basin is only 10% woody. It is therefore expected that the high total organic carbon content will offset the lower generation efficiency.

Van Krevelen type diagrams (Figure 8.6) for separate intervals *L.N.asperus* - *P.asperopolus* and *M.diversus* show the presence of mixed Type II/Type III organic matter. The Palaeocene-Cretaceous sediments are predominantly Type III kerogens.

Hydrogen Index values (HI = S2/g TOC) suggest the presence of organic matter which is a mixture of oil and gas-prone Type II-III kerogen (Figure 8.7). Good quality organic matter occurs in the Eocene and Palaeocene sections of the EVCM. Samples with hydrogen index values greater than HI = 200 are considered to have significant liquid hydrocarbon source potential.

Very low hydrogen index values (HI less than 50) characterise thermally altered Eocene sediments immediately overlying igneous intrusions such as those at Koorkah 1 (T/18P) and Flinders 1 (Figure 8.8), compared with the Pelican Trough wells (Figure 8.9).

In this study, the kerogens input to the models used a predominance of Type III kerogen for the source rock in the Eocene, Palaeocene and Cretaceous sections (Table 8.1). However, Hydrogen Indices, Van Krevelen Plots and geological models indicate a lacustrine, more oil prone Type II kerogen also exists. A kerogen mix of approximately 20% Type II and 80% Type III was created and used in the Pelican Deep modelling reflecting the possibility of oil prone sediments near the centre of the Pelican Trough.

TABLE 8.1

APPROXIMATE KEROGEN TYPE AND DESCRIPTIONS

TYPICAL OF THE PELICAN TROUGH

(modified after Tissot & Welte 1978)

PROVENANCE	Kerogen Type		
Aquatic	Algal / Amorphous	Liptinite	Type I
	Herbaceous (Fibrous)		Type II
Sub-aerial (Terrestrial)	Woody (plant structure)	Vitrinite	
	Coaly (angular to sub-angular fragments)	Inertinite	Type III

Shading shows kerogen type common in the Pelican Trough area.

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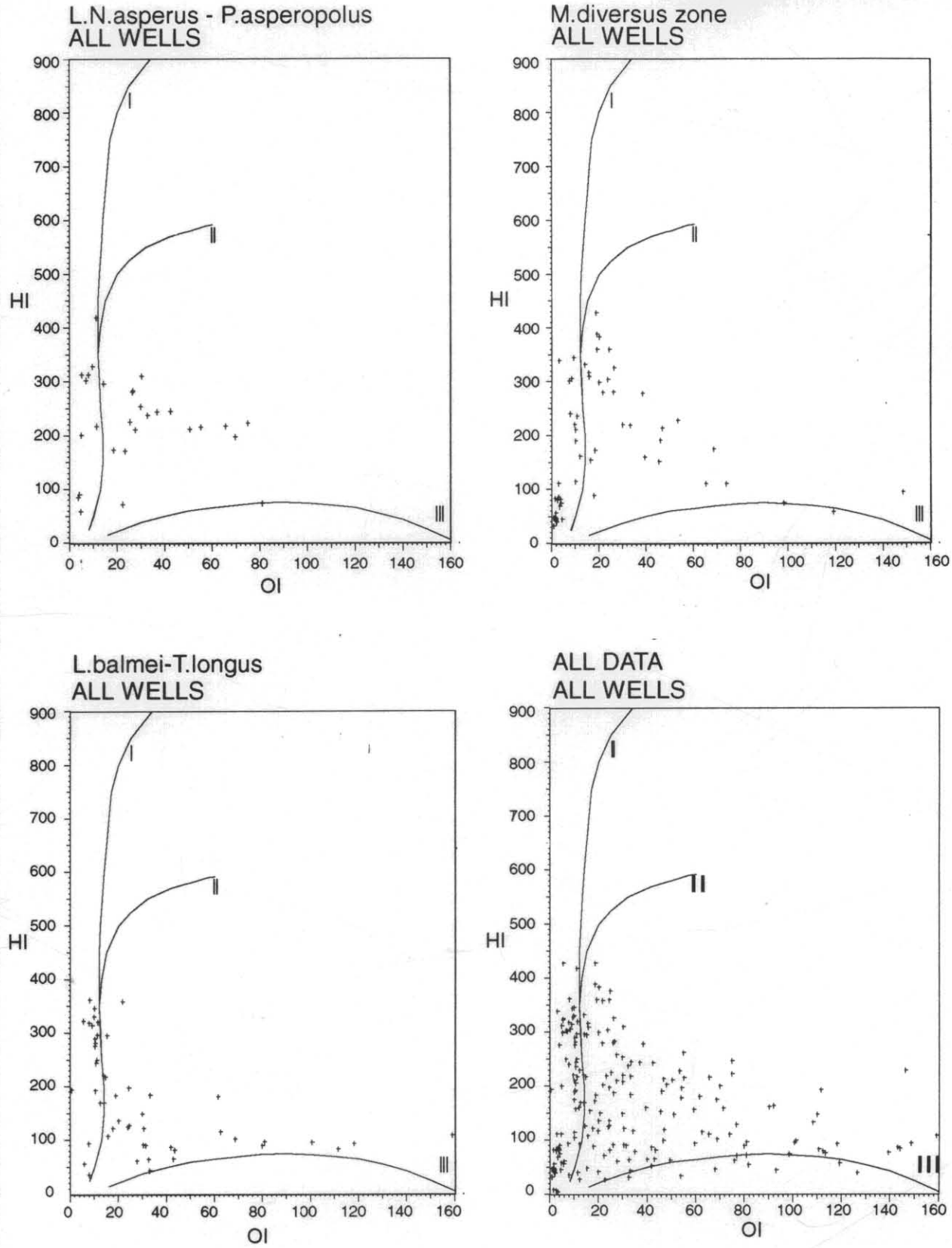

BASS BASIN - TASMANIA

T/25P

KEROGEN TYPE - VAN KREVELEN DIAGRAM

PELICAN TROUGH

AMHYD014.PRS Fig. 8.6

5 cm

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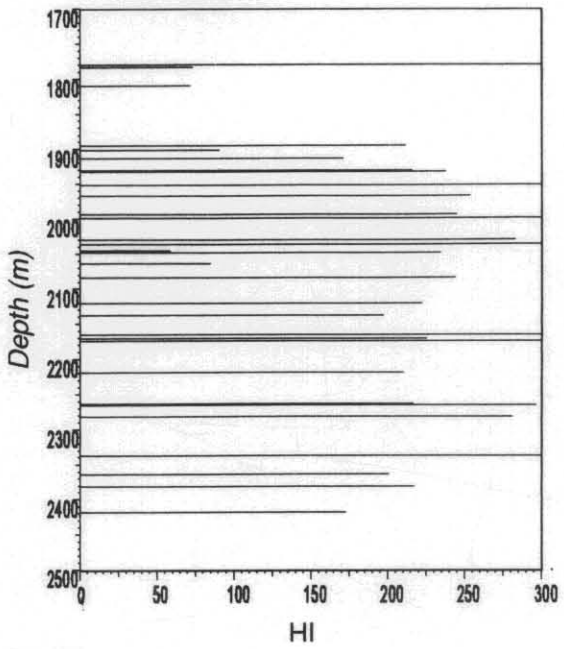
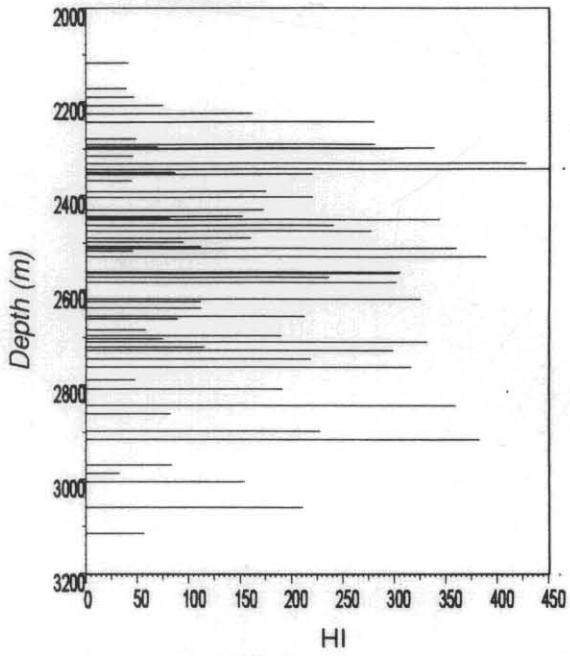
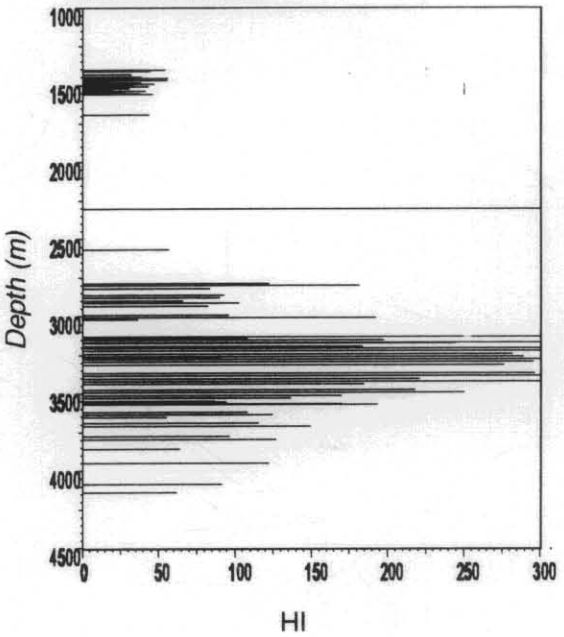
L.N.asperus - P.asperopolus
ALL WELLS



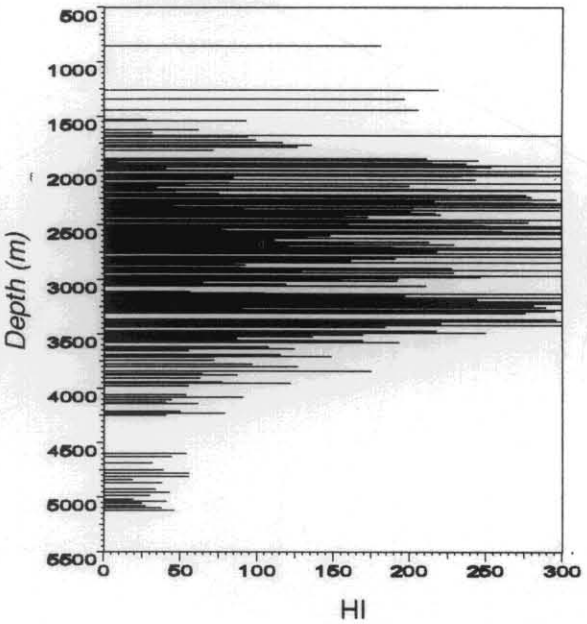
M.diversus zone
ALL WELLS



L.balmei-T.longus
ALL WELLS



ALL DATA
ALL WELLS



BASS BASIN - TASMANIA

T/25P

KEROGEN TYPE - HYDROGEN INDEX

PELICAN TROUGH

AMHYD014.PRS Fig. 8.7

5 cm

491121

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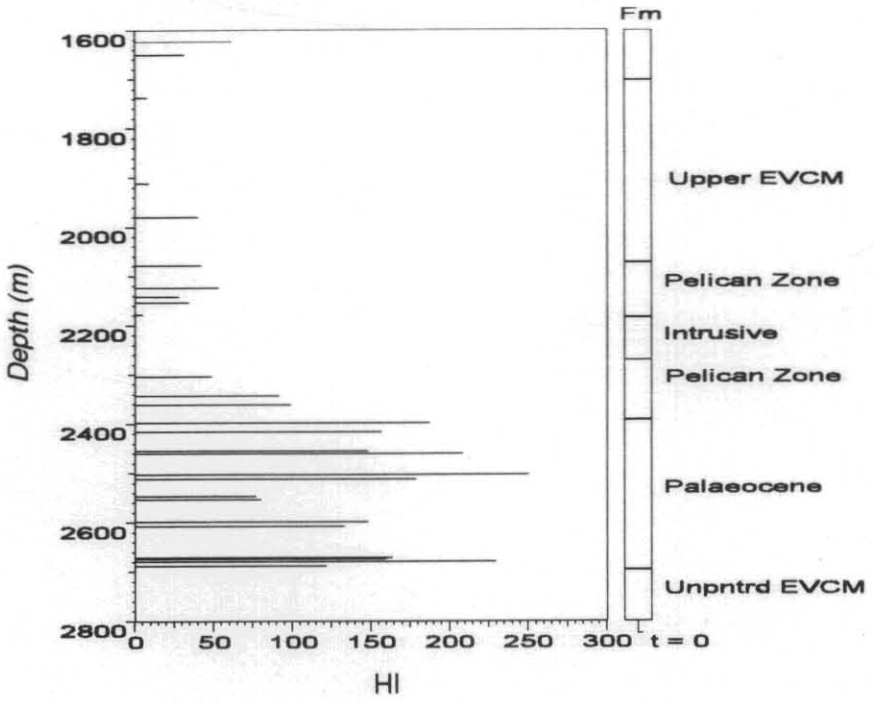
FLINDERS 1



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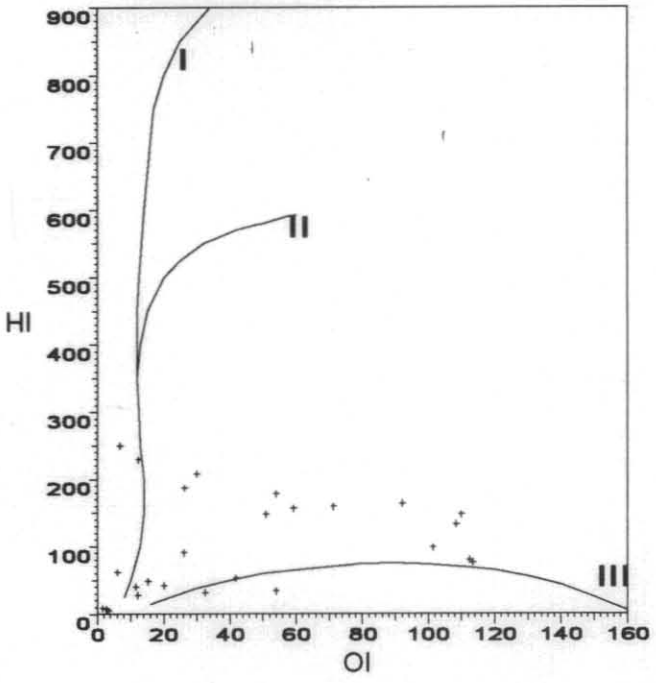

BASS BASIN - TASMANIA

T/25P

KEROGEN TYPE FLINDERS 1

5 cm

AMHYD014.PRS Fig. 8.8

491122

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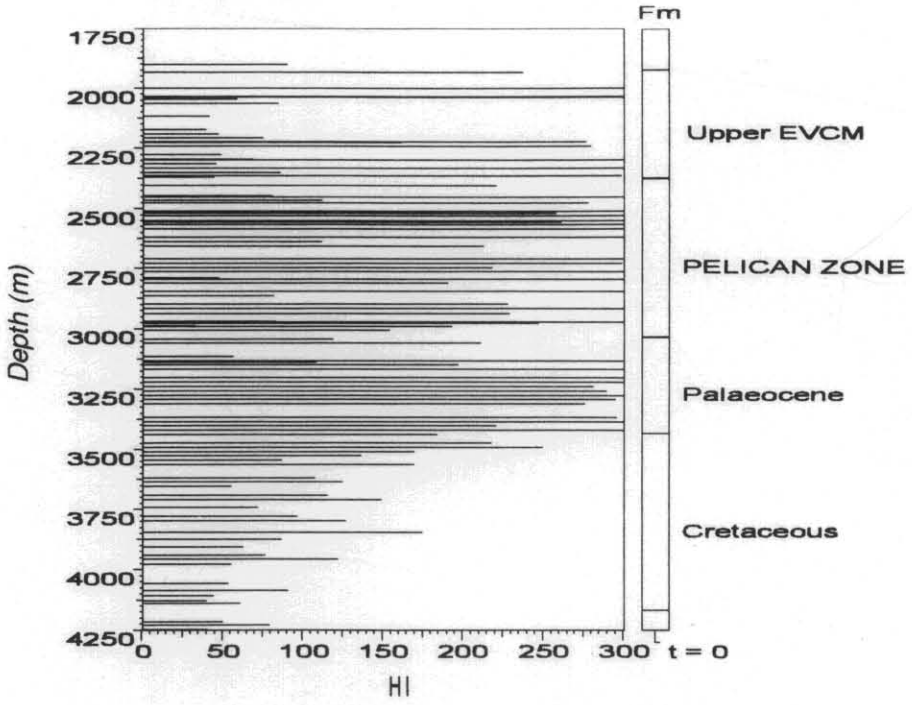
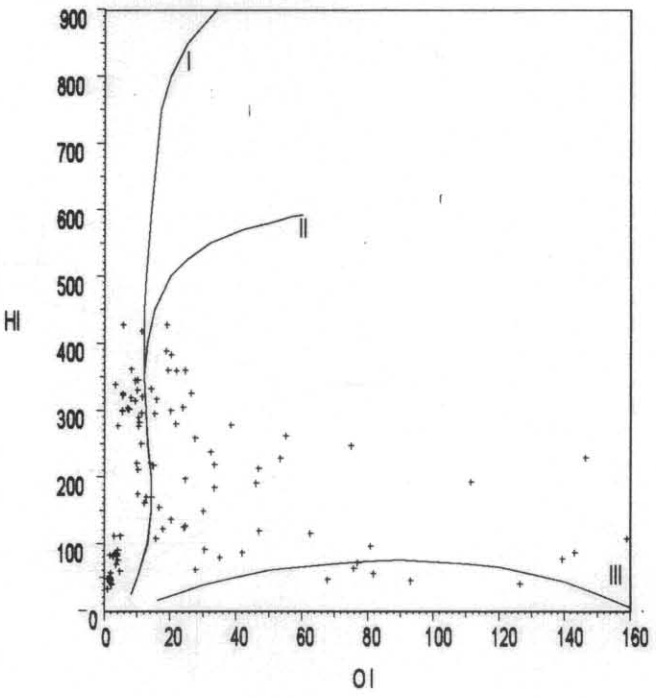
PELICAN 5



PELICAN 5



BASS BASIN - TASMANIA

T/25P

KEROGEN TYPE PELICAN 5

5 cm

AMHYD014.PRS Fig. 8.9

9 HYDROCARBON SHOWS AND DISCOVERED HYDROCARBONS

9.1 Hydrocarbon Shows

The objective of this section is to identify the type and extent of hydrocarbons shows encountered in the wells of the study area. All 9 wells in T/25P were examined.

The primary data for the T/25P wells pre-1985 were derived from the SAOGC report "Bass Basin Hydrocarbon shows" by AR Waldron (1986). Information for subsequent wells (Pelican 5, Flinders 1) were derived from their respective Well Completion Reports and mudlog data.

9.2 Method and Coding Description

Hydrocarbon occurrences with greater than background readings were considered as a "show" and detailed in Appendix 5 on the show description forms.

No oil or gas occurrences were regarded as a 'show' if associated with coal beds. Any exceptions were the result of ambiguities on the mudlog data, and were annotated as such on the description form. Oil staining without associated fluorescence was not regarded as a show. Mineral fluorescence was also not regarded as a show.

9.3 Discussion

The results of the hydrocarbon show evaluation indicate that shows are widespread throughout the permit. The following general observations can be made:

1) The *M.diversus* and *L.balmei* palynological zones have by far the majority of hydrocarbon shows and recoveries, the best of which were from the Pelican Field wells. The regional prospectivity of this section and the Pelican Trough area should be considered as primary objectives in assessing future drilling in the permit area. Pelican 5 flowed 5.6 MMCFD and 302-441 BCPD.

2) The upper-EVCM (*N.asperus-P.asperopolus*) encountered hydrocarbons in

approximately half of the wells studied with major shows and FIT recoveries from the Pelican 4 and 5 wells.

3) The distribution of shows around the Pelican and Cormorant Troughs indicate vertical migration of deep sourced hydrocarbons has occurred into structures close to the basin depocentres.

4) Lateral migration out of the sub-basin would predominantly be in the southwest and northeast dip directions, as a result of the structural nature of the half-graben.

10 MATURITY MODELLING

10.1 Objectives

The objective of the maturity modelling study was to:

1) Establish potential hydrocarbon type and source potential of the Eastern View Coal Measures (EVCM) in the Pelican Trough,
2) Establish maturity profiles in key wells,
3) Create isoreflectance maps using well-control and new regional structural maps,
4) Determine the timing of hydrocarbon generation,
5) Identify mature source areas,
6) Document possible migration routes.

This was achieved by creating models simulating the maturation history of sediments within T/25P and adjacent areas, and integrating relevant geochemical, geophysical and geological data.

10.2 Maturity Modelling

Modelling was carried out on a personal computer using version 3.15 of Basin Mod®, a commercially available modular software program from Platte River Associates Inc.

Maturation modelling using BMOD® requires the input of:

1) A geological model of the sedimentary section,
2) A heat flow model,
3) A lithology and porosity compaction model from which thermal conductivity with time can be evaluated,
4) A model of the kinetic parameters of the kerogens within each source rock interval.

Two wells, Flinders 1 (flank setting) and Pelican 5 (trough setting), were used as a guide in examining the thermal and tectono-sedimentary history of the area. The extrapolation of well profiles, using seismic data, yielded a thermal maturation history of parts of the basin beyond present drilling depths (Pelican Deep Model) and in areas untested (maturity maps). Maturation modelling provides an estimate of the timing of hydrocarbon generation.

10.3 Stratigraphy and Compaction Effects

Stratigraphic data were provided as formation tops and unit thicknesses, obtained from wells and seismic data. Some formations were further subdivided into two or three lithologically distinct units (eg EVCM Units A, B and C - Appendix 6) in order to model their compaction and heat flow characteristics. Use of such data in basin modelling routines can provide more accurate estimates of both the timing and extent of hydrocarbon generation in sedimentary systems.

Lithologies were obtained from mudlogs and petrophysical logs and were specified as percentages of sand, silt, shale and occasional coals and volcanics. The stratigraphic units and their respective lithologies used for basin modelling are outlined in Appendix 2.

Mechanical compaction was calculated using the Sclater-Christie Compaction model (1980) (a porosity-depth dependent exponential algorithm). The basic assumption made is that the thickness of sediments are reduced by a predictable amount according to lithology and depth of burial. The equation used is considered to be more accurate than the Falvey/Middleton (1981) model when rapid rates of deposition have occurred.

10.4 Burial History Model

The Pelican Trough contains a sedimentary section up to 6 kilometres thick. The deepest well in the area is 4267m deep (Pelican 5), and therefore estimation of parameters for maturity and burial history models must be made from seismic data and regional correlations for the deepest, most mature source rocks.

Burial history models were constructed using the thickness and chronology of the stratigraphic units (van Hinte 1978, Sclater and Christie 1980) observed at the locations studied. Burial curves for the investigated section were generated for Flinders 1 (TD of 2700 metres subsea in *L.balmei*) and Pelican 5 (TD of 4267 metres subsea in *T.lillei*) as well as for an extrapolated Pelican Deep location (estimated depth to basement of 6000 metres subsea).

Empirical modelling methods (Katz, *et al.*, 1988) suggest that vitrinite reflectance profiles across stratigraphic unconformities can be used as an estimation of the amount of eroded section. Applied to the Bass Basin values in the range of 500-1000 metres have been applied based on estimated removal of section from seismic data and the basin's tectonic history.

Geohistory models, including palaeo-sea levels, were not attempted because of the rapid burial and relatively small sea-level variations likely to have affected the mainly non-marine sediments of the Eastern View Coal Measures.

10.5 Thermal History

The thermal history is vital to both maturity modelling (Section 10.6-10.7) and kinetic modelling (Section 10.8). It is important to determine whether a potential source rock contains organic matter that is thermally immature, mature or overmature with respect to oil and gas generation. A good control on temperature will aid in this determination as a change from kerogen to oil and gas is fundamentally controlled by heat input. Changes in maturation and kinetics occur exponentially with respect to temperature while changes occur linearly with respect to time.

The present-day estimated mean surface temperature of the offshore Bass Basin was taken at 10°C, and with subsurface data, was used to generate a temperature-depth profile for the Flinders 1 and Pelican 5 wells (Figure 10.1). Subsurface temperature data were derived from DSTs, which are the most accurate, and from BHTs of logging suites derived from Horner Plots. The calculated and measured data show a good fit, thus adding confidence to a good heat flow/maturity model.

491128

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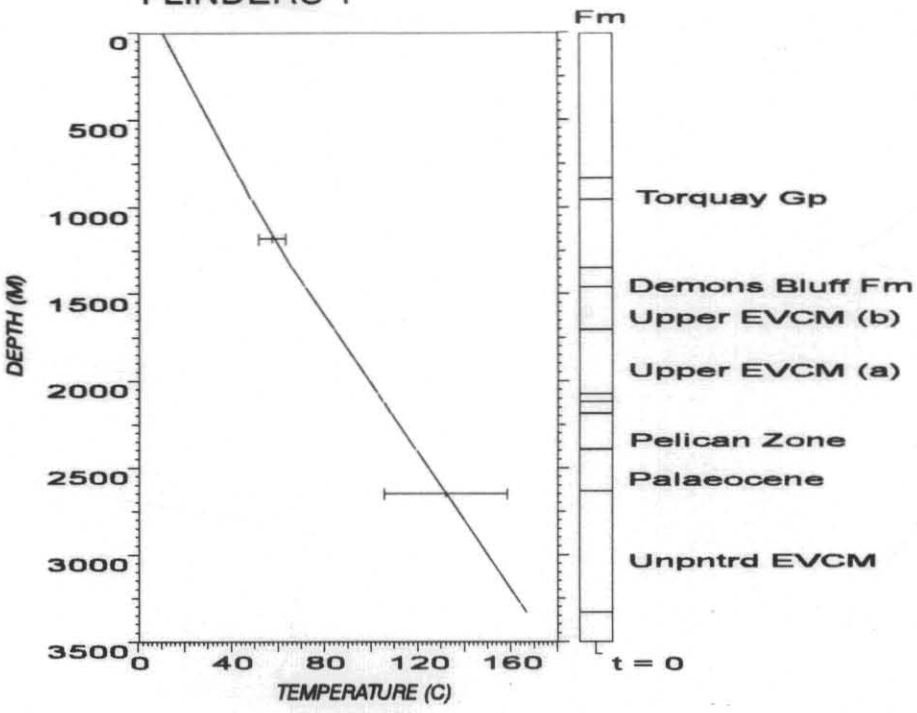
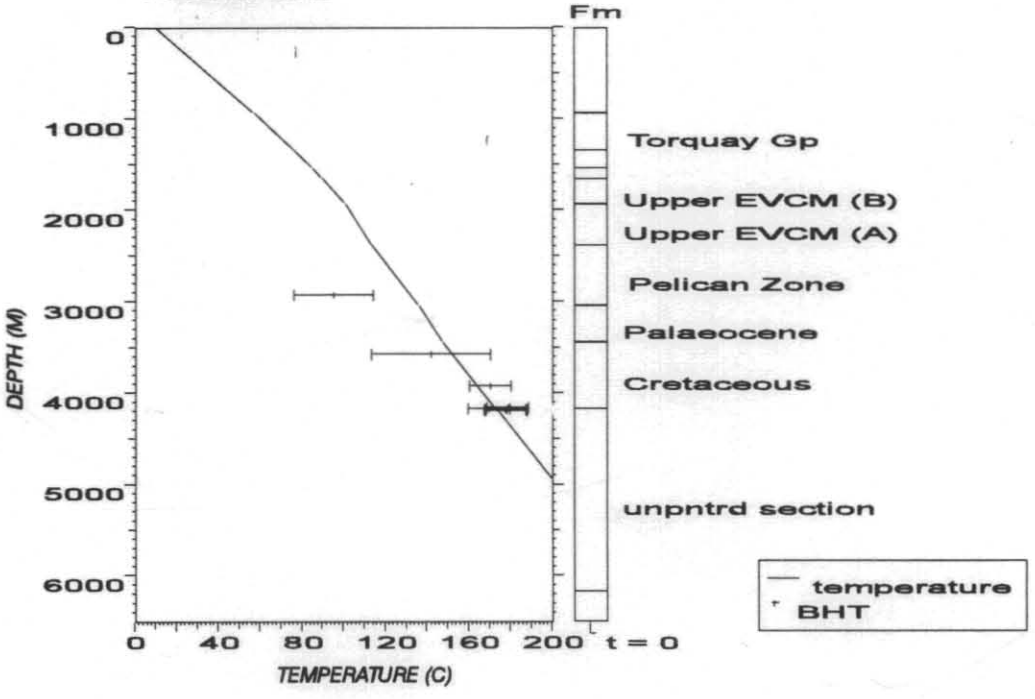
FLINDERS 1



PELICAN 5



BASS BASIN - TASMANIA

T/25P

TEMPERATURE PLOTS FLINDERS 1 / PELICAN 5

5 cm

AMHYD014.PRS Fig. 10.1

The temperature profile was then modelled using steady-state heat flow and estimates of the thermal conductivities of the various stratigraphic units. The geothermal gradient method was not used because of its inability to model the effects of varying thermal conductivity with lithology and time.

10.6 Conductivities

The thermal conductivities of each individual lithological unit were selected from published data included in the BMOD® software and are dependent on:

1) Lithologies (matrix conductivities*)
2) Porosities (Sclater-Christie Compaction Method Section 10.3)
3) Temperatures (derived from BHT, DST data Section 10.5)

* Matrix conductivities of the rocks were calculated from the entered lithology values for the Flinders 1 and Pelican 5 wells (Appendix 6). The computed BMOD values were derived from the results of experimental work done by Brigaud and Vasseur (1989) and Gretener (1981), and were used as guidelines in determining appropriate values for the present modelling study.

10.7 Heat Flow

Present-day heat flow is constrained by measured present-day surface and subsurface temperatures and thermal conductivities (Waples *et al.*, 1992). The palaeo-heat flow values were determined by:

1) Tectonic concepts (extensional model)
2) Lithology data (thermal conductivities: Appendix 6)
3) Thermal indicators (Ro values: Section 10.8)

For modelling purposes, a steady-state equilibrium thermal condition was employed and the heat flows were adjusted within acceptable geological limits (Tissot and Welte, 1978). The generalised heat flow curve for a rifted-type basin is a steady rise in heat flow from the inception of the rifting phase, a peak around break-up, followed

by cooling during the drift phase. The Bass Basin even at the onset of rifting was probably located distant from major high heat flows associated with a conventional spreading ridge and therefore the variations in the heat flow with time are relatively small and consequently have had little influence on the modelled maturity.

10.8 Thermal Indicators (Vitrinite Reflectance data-TMAX)

Vitrinite-reflectance (Ro) was used as the maturity and thermal indicator with which to check the validity of maturity models. In general the data appear to be of good quality, as shown by the well-defined trend with depth, by sample histograms (not shown) with little scatter, and by good agreement between measurements made on cuttings and cores. Anomalous values are evident around localised zones showing elevated rank immediately adjacent to igneous activity (eg Flinders 1, Koorkah 1, Pipipa 1). Modelling was undertaken so that calculated Ro values fit closely with measured values. This adds confidence in the maturity model allowing confident prediction of hydrocarbon generation.

Vitrinite-reflectance values can be calculated either using the TTI method (Lopatin 1971; Waples 1980) or the kinetic method, and are then compared with measured Ro data (Waples *et al.*, 1992). In this study, the kinetic method using parameters derived by the Lawrence Livermore National Laboratory (LLNL) calibrated through BasinMod® has been employed. This method uses a distribution of Arrhenius rate constants to calculate global vitrinite maturation and then correlates maturation with reflectance.

The vitrinite values of the Pipipa 1, Flinders 1 and Pelican 5 wells are illustrated by Figure 10.2. The non-linear nature of measured Ro data in the Pipipa 1 and Flinders 1 wells is a function of anomalously high values associated with igneous intrusives and have been ignored in the evaluation of gradients.

Although good control was obtained for the variation of Ro with depth (Pelican 5, Figure 10.3; Flinders 1, Figure 10.4), variations in the type of vitrinite, maceral associations and the possible presence of cavings may influence the results by producing systematically lower values. Both maturity profiles have been drawn to account for these factors.

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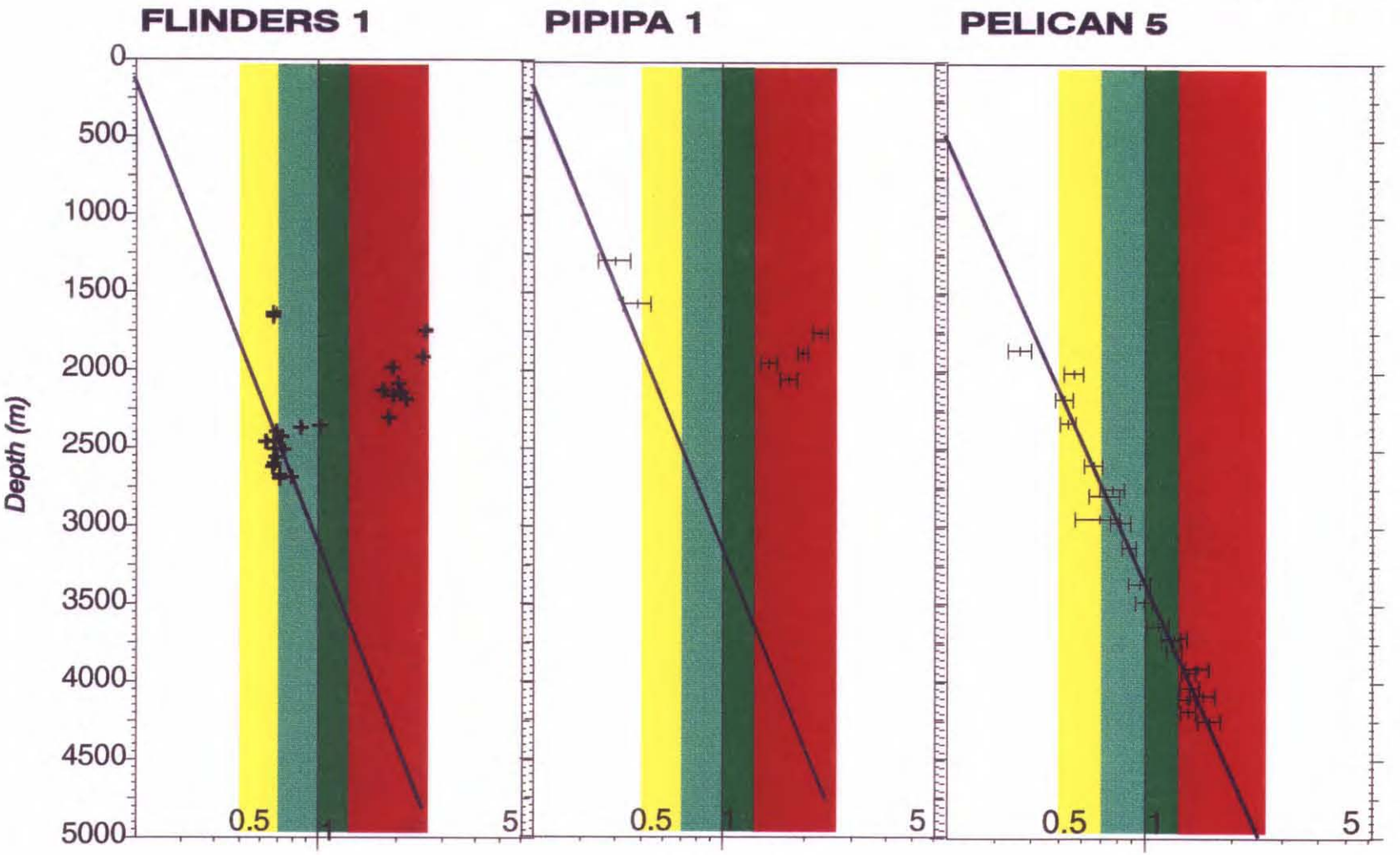


BASS BASIN - TASMANIA
T/25P

Pelican 5 Maturity Gradient

MATURITY PLOTS

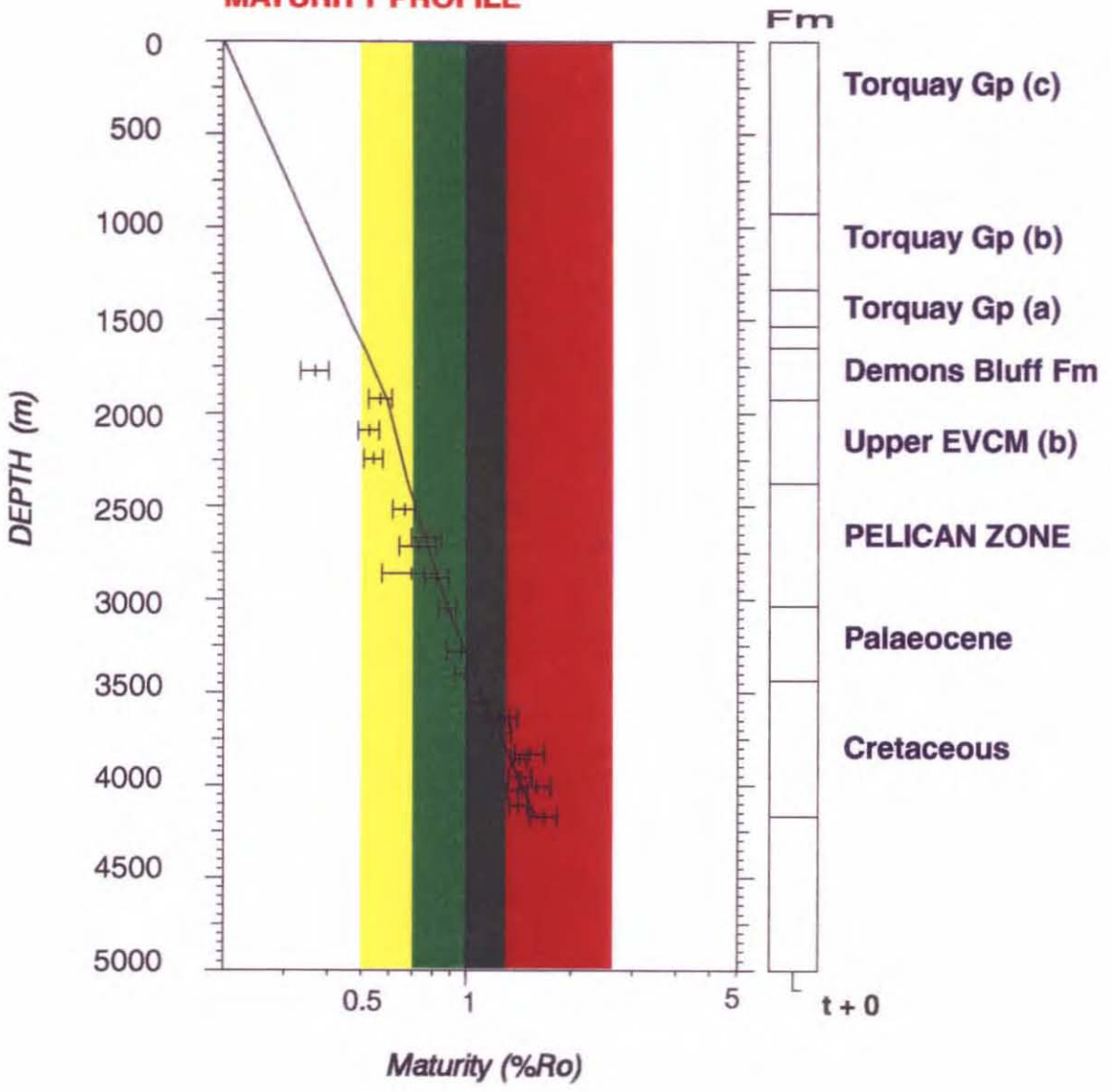
AMFLI194.PRS Fig. 10.2

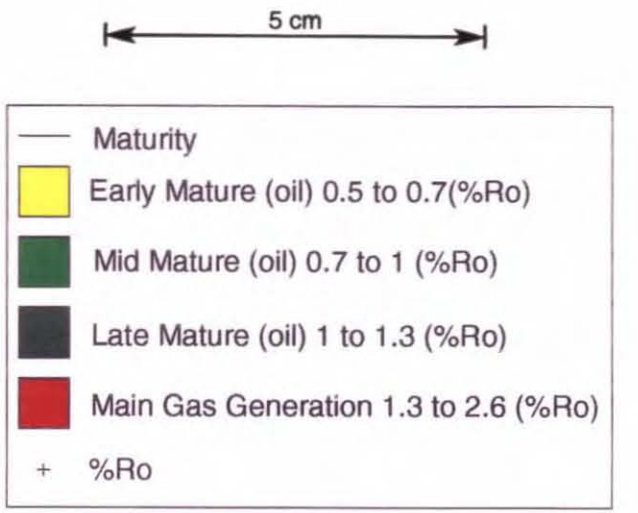
5 cm

SAGASCO Resources Ltd.

PELICAN 5

MATURITY PROFILE



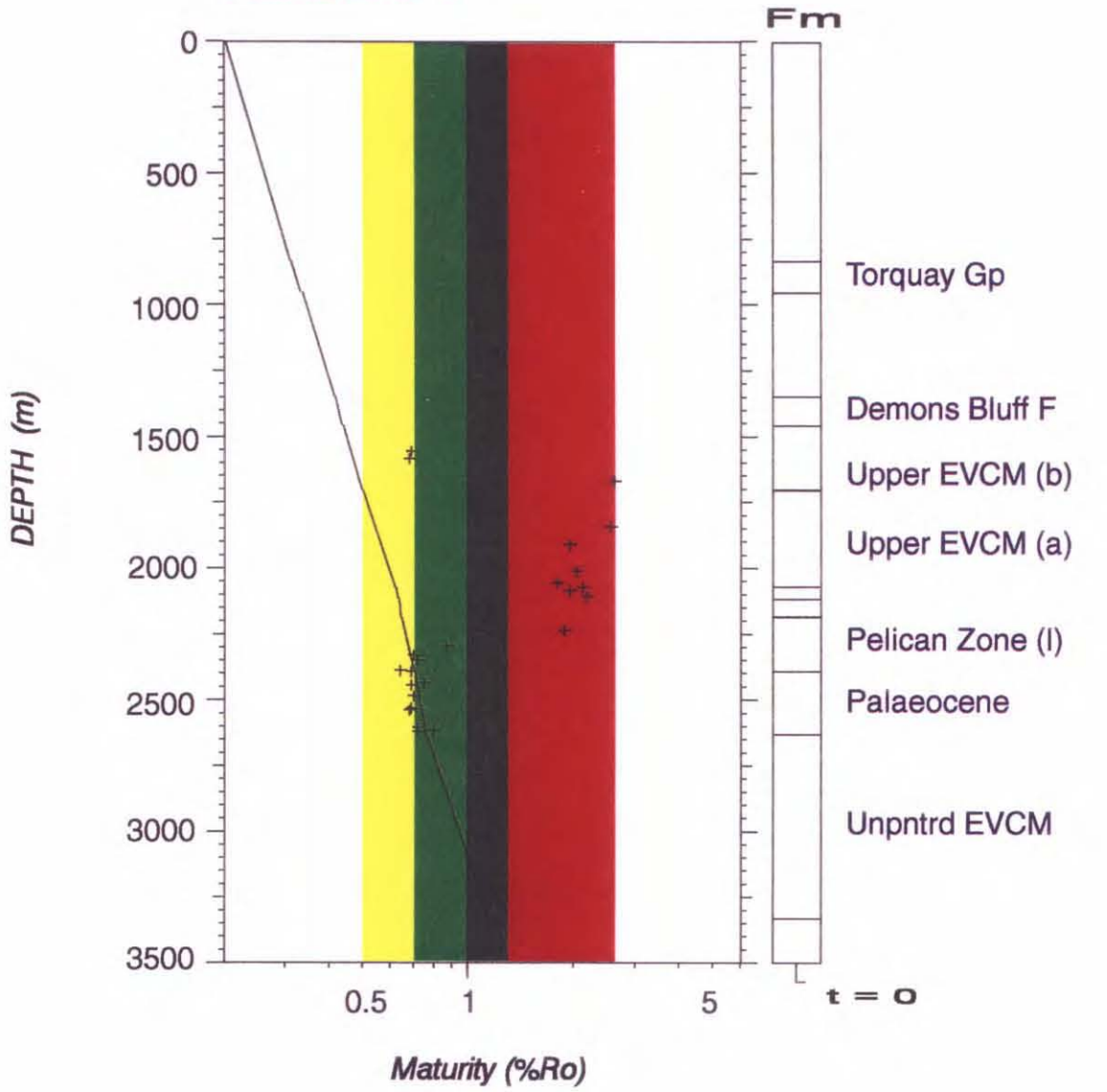


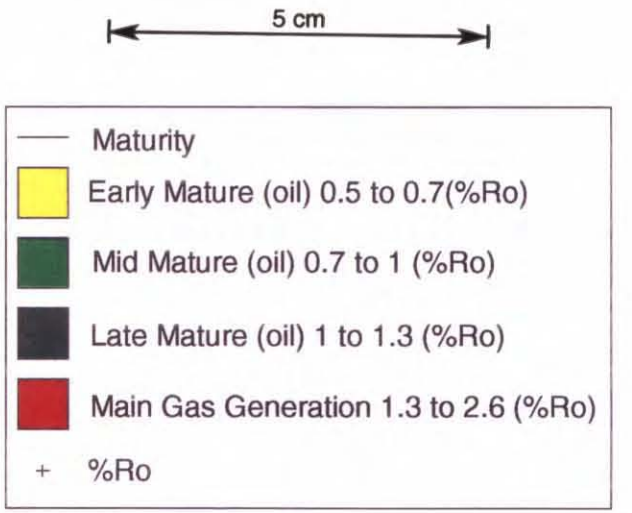
BASS BASIN - TASMANIA
T/25P

PELICAN 5
MATURITY PLOT

SAGASCO Resources Ltd.

FLINDERS 1





BASS BASIN - TASMANIA
T/25P

FLINDERS 1
MATURITY PLOT

AMFLI194.PRS Fig. 10.4

1) *Pelican 5 Vitrinite Reflectance Profile*

The vitrinite reflectance versus depth profile for Pelican 5 (Figure 10.3) indicates that the Eocene section of the EVCM above 1750 metres is thermally immature (VR < 0.5%). However, generation of light oil from sediments of such low rank may occur where the DOM is rich in resinite (Snowden and Powell 1982, Powell 1985), as appears the case at Pelican 5 (Watson 1986). Whilst generation may have occurred it is probable that significant expulsion of this hydrocarbon has not occurred.

Eocene sediments within the interval 1750-2500m depth are marginally mature (0.5-0.7% Ro). The presence of exsudatinite in coals, and oil in sandstones and siltstones from this part of the section (Watson op.cit.) suggests that mobilisation of liquid hydrocarbons has commenced.

The top of the main oil window (Ro = 0.7%) in Pelican 5 is located at approximately 2500 metres depth in the Eocene section of the EVCM. The base of the oil window (Ro = 1.25%) occurs at about 3750 metres depth in the Cretaceous portion of the EVCM. Sediments below 3750m depth are presently mature for gas generation.

2) *Flinders 1 Vitrinite Reflectance Profile*

The Flinders 1 vitrinite reflectance versus depth profile (Figure 10.4) shows a significant zone of elevated rank immediately adjacent to the igneous intrusion. Apart from these localised 'over mature' values, the Eocene, Palaeocene and Cretaceous sediments fit along a similar trend to the Pelican 5 data (Figure 10.2 and 10.3).

The vitrinite reflectance profile indicates that the sedimentary section penetrated by Flinders 1 is sufficiently mature for the generation of early light oil from resinite-rich dispersed organic matter (DOM) below 2300 metres depth (VR ≈ 0.7%). The section is not sufficiently mature to reach the peak to late mature oil threshold (VR ≥ 1.0%).

A zone of mature and overmature sediments occur above and below the sill (1600-2250m).

3) *Igneous Intrusion - Its effect on maturity*

At Flinders 1 a dolerite igneous sill was encountered at 2208-2275 metres depth. Maturity data (TMAX and Vitrinite Reflectance values) show unusually high and relatively constant values throughout the upper EVCM (thickness in excess of 500 metres) down to the top of the igneous intrusion.

Normally it would be expected that the high maturity profile above the intrusive would be quite similar to that observed below it (approximately 50 metres either side of the sill), as evident with the igneous sill at Koorkah 1. However at Flinders 1, from near top EVCM to immediately below the igneous intrusive TMAX (> 460°C) and Ro values* are consistently overmature whilst the lower part of the EVCM below approximately 2400 metres has TMAX and Ro values in the oil mature window (430-460°C) consistent with a regional maturity profile unaffected by the intrusion (Figure 10.4).

The Pipipa 1 well, believed to be in the vicinity of an igneous intrusive also shows a marked zone of elevated maturity near the TD of the well (Figure 10.2).

The reason for this unusual profile is not clear, however two hypotheses have been postulated;

1) *Fault acting as a conduit for igneous activity* (Figure 10.5): The nearby NW-SE trending fault bounding the Flinders structure, acted as a conduit for igneous activity inducing a high heat flow within the sediments in the upper part of the EVCM. Seismic data (Line TNK4-79) shows evidence of a possible (Miocene ?) sequence of extrusive igneous rocks to the SW of the

* NOTE: TMAX values in these samples are unreliable because of the small, ill-defined S2 peaks in their Rock-Eval pyrograms.

FLINDERS 1 IGNEOUS VENT

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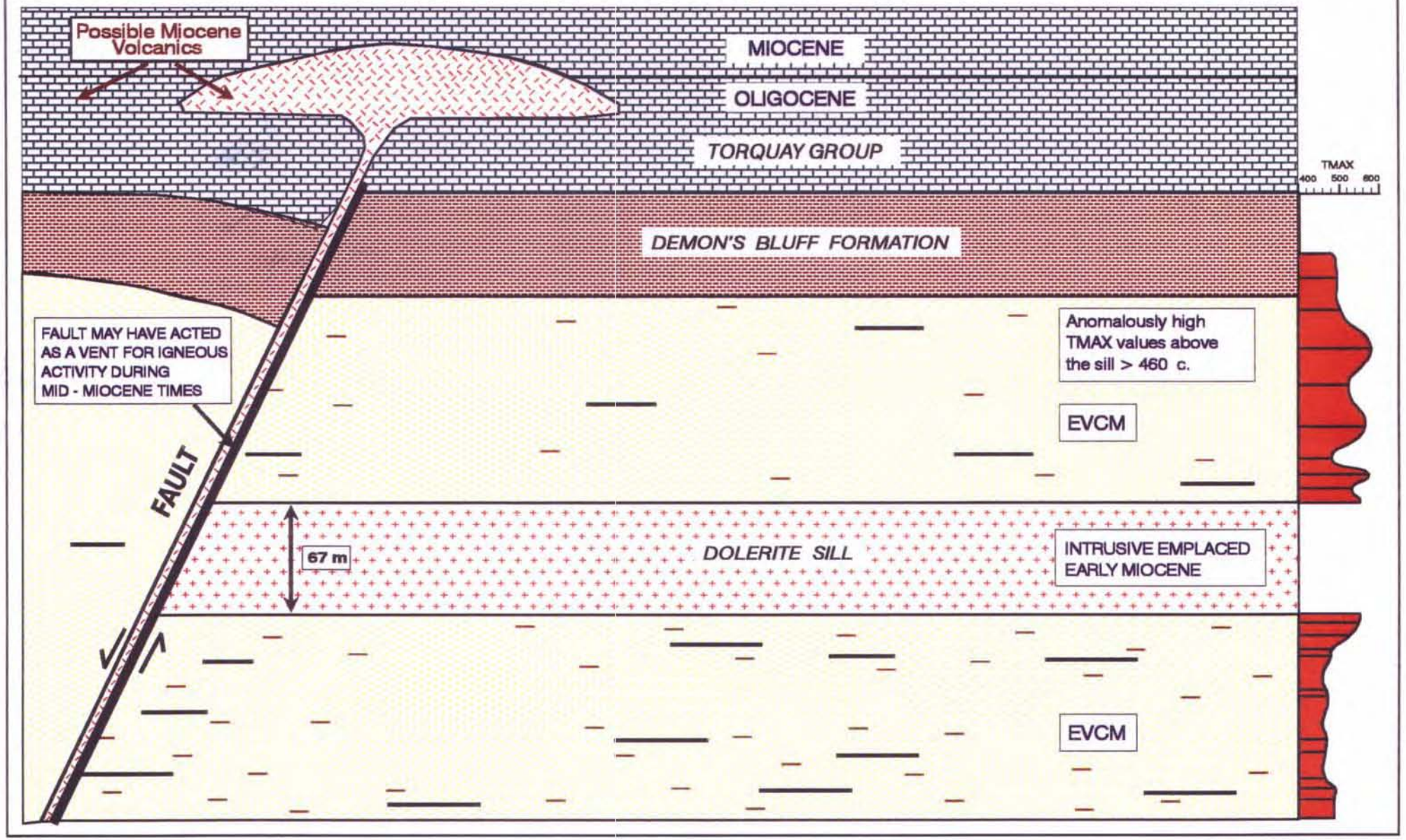


AMFLIN10.PRS Fig. 10.5

fault. Several "bright spots" evident on the seismic lines in the area could be the result of igneous activity. These extrusives are probably the same age as the intrusion penetrated in Flinders 1.

2) *Convection Model* (Figure 10.6): A higher percentage of sands (greater porous section) in the upper EVCM has allowed the generation of convective heat cells in these sediments, raising the maturity of organic matter uniformly. The lower EVCM (high percentage of shales, silts, and coals) is not inducive to conduction due to the lower gross porosity and impermeable nature of the beds, thus inhibiting heat flow.

10.9 Maturity Maps - Assumptions

To illustrate the distribution of mature sediments, maturity maps have been constructed at several major stratigraphic levels:

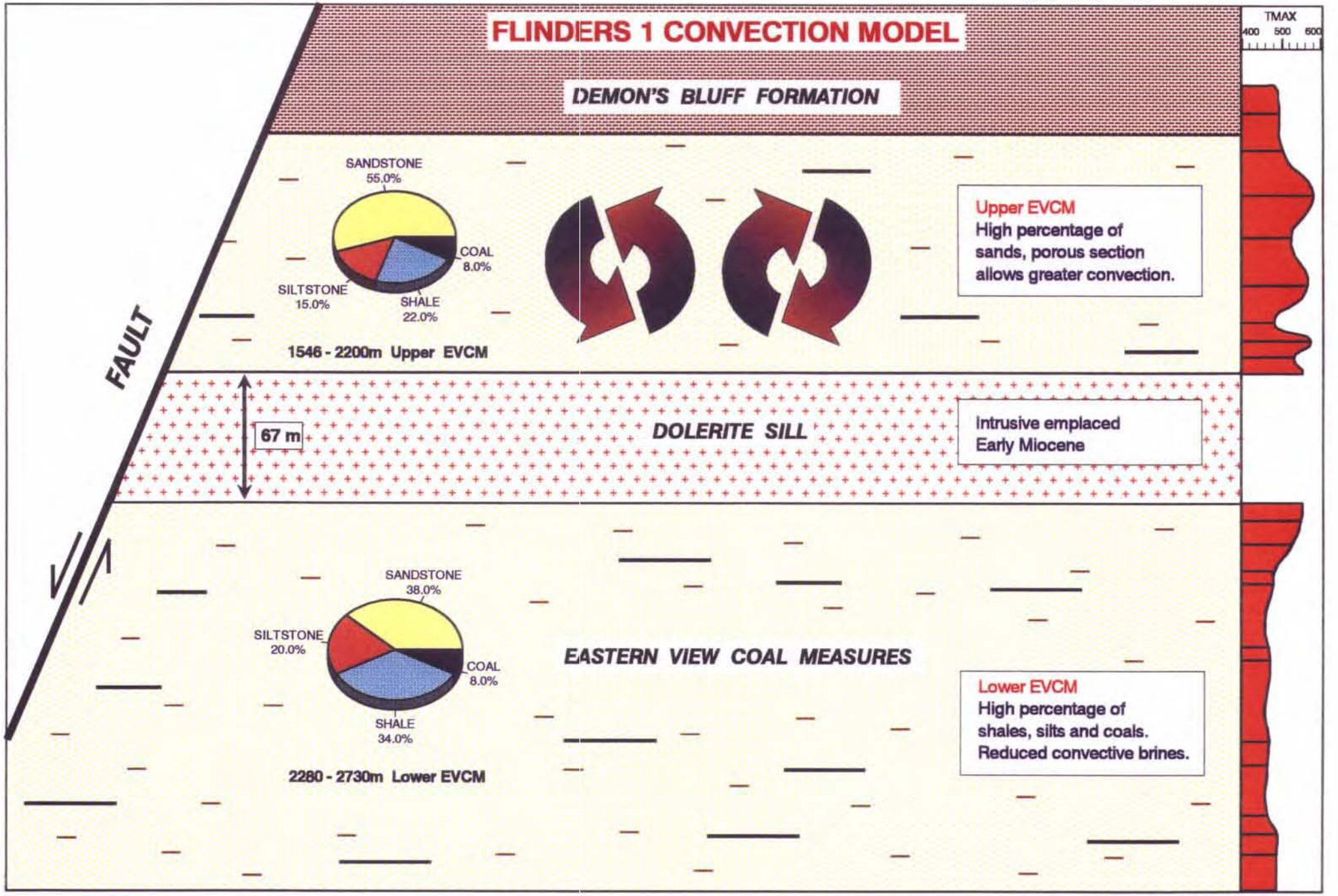
1)	Top EVCM	(Figure 10.7 and Enclosure 20)
2)	Top Upper *M.diversus*	(Figure 10.8 and Enclosure 21)
3)	Top Middle *M.diversus*	(Figure 10.9 and Enclosure 22)
4)	Top Lower *M.diversus*	(Figure 10.10 and Enclosure 23)
5)	Top Palaeocene	(Figure 10.11 and Enclosure 24)
6)	Basement	(Figure 10.12 and Enclosure 25)

In addition palaeo-maturity maps were made for basement in order that the volume of source rocks mature within the basin at various stages during its development could be determined.

To this end the following maps were produced:

1)	Basement Vitrinite Reflectance at Palaeocene Time	(Figure 10.13)
2)	Basement Vitrinite Reflectance at Middle *M.diversus* Time	(Figure 10.14)
3)	Basement Vitrinite Reflectance at Upper *M.diversus* Time	(Figure 10.15)
4)	Basement Vitrinite Reflectance at Top Demon's Bluff Time	(Figure 10.16)
5)	Basement Vitrinite Reflectance at Late Oligocene Time	(Figure 10.17)
6)	Basement Vitrinite Reflectance at Late Miocene Time	(Figure 10.18)

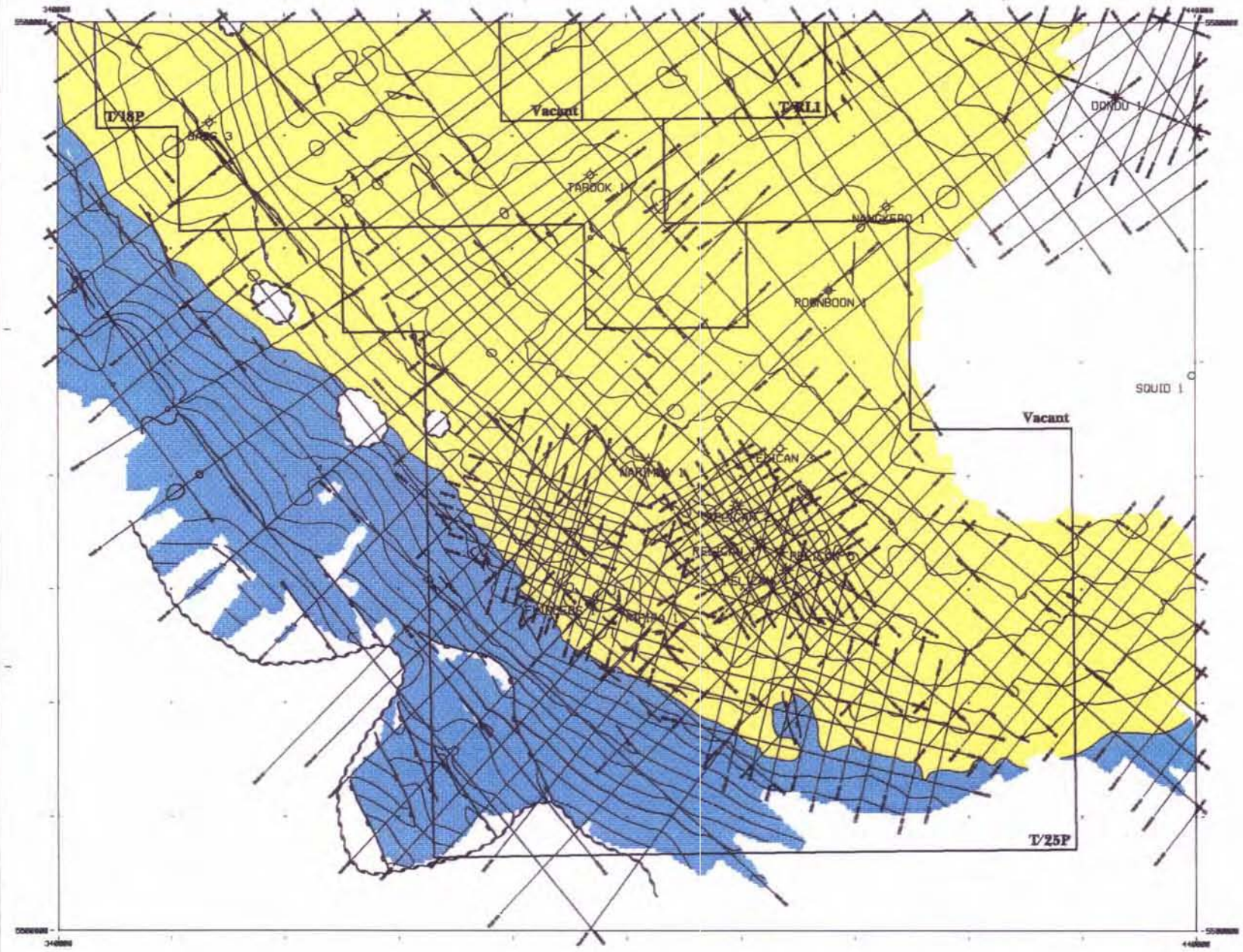
491138



AMFLIN10.PRS Fig. 10.6

491139

SAGASCO Resources Ltd.



5 cm

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	0.7 – 1.0%
	1.0 – 1.3%
	1.3 – 2.6%
	>2.6%

N

0 15km.

Scale 1:500000

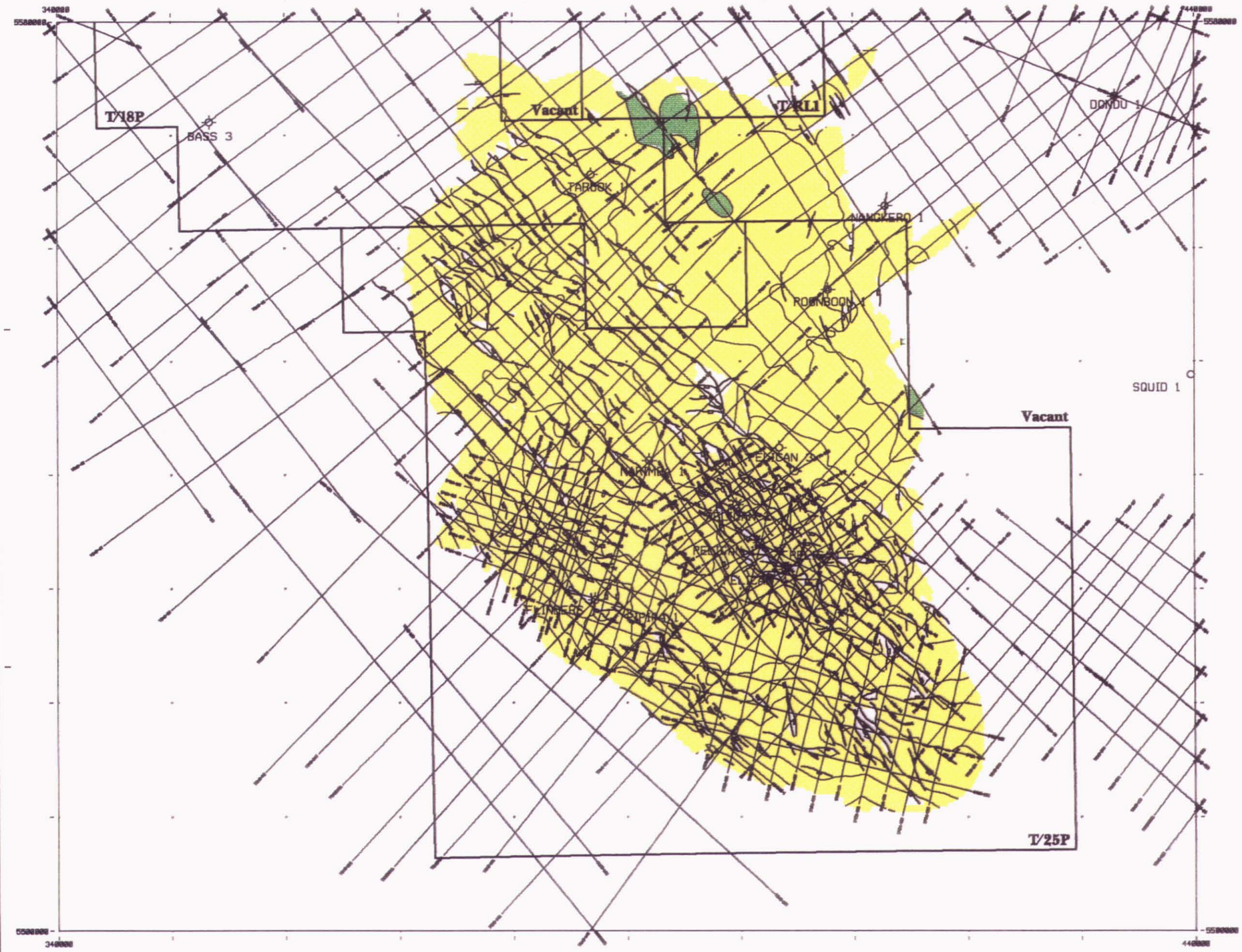
BASS BASIN T/25P

VITRINITE REFLECTANCE AT TOP EVCM

No: 10731.0794 FIG. 10.7

491140

SAGASCO Resources Ltd.



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	1.0 – 1.3%
	1.3 – 2.6%
	> 2.6%

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Scale 1: 500000

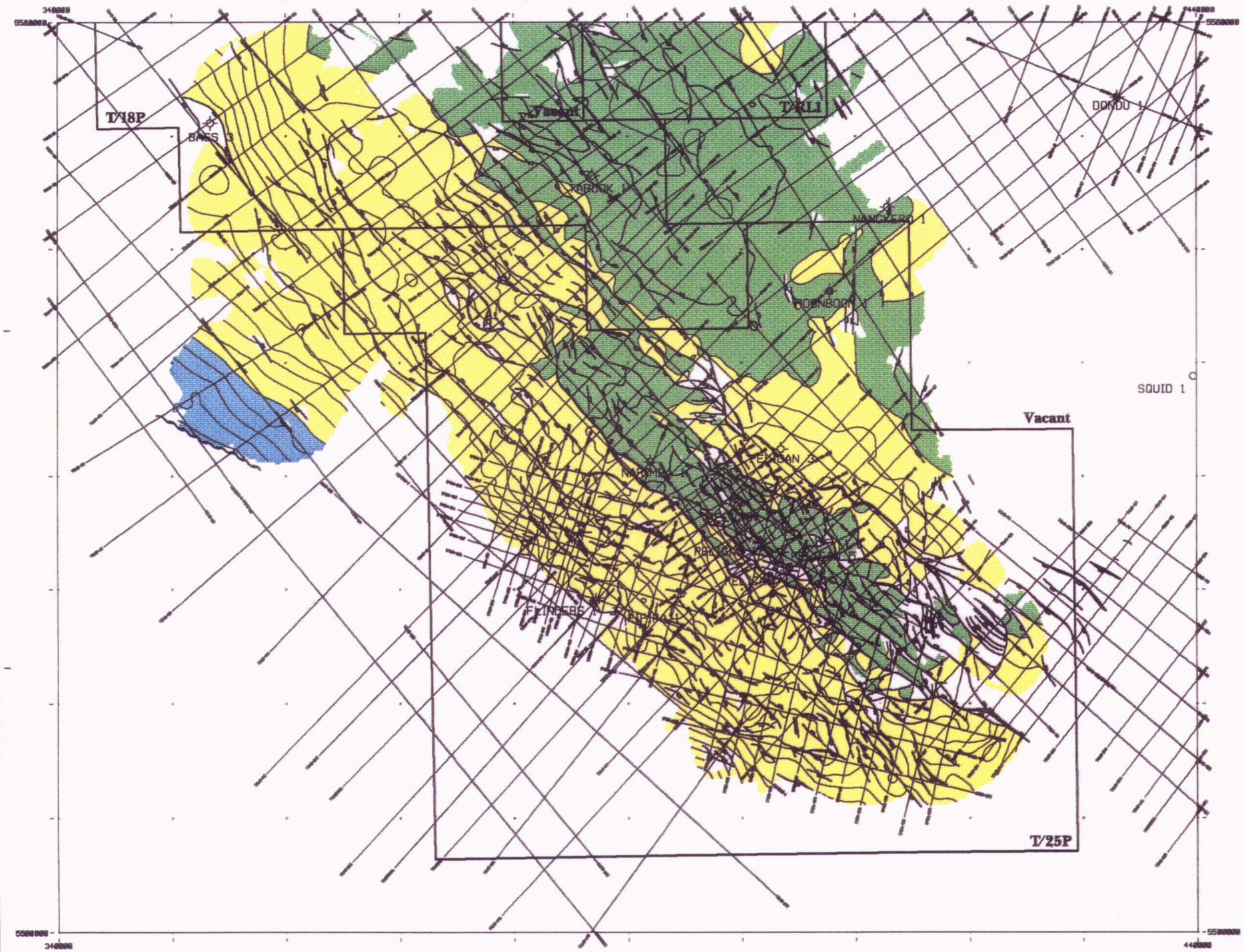
BASS BASIN T/25P

VITRINITE REFLECTANCE
TOP UPPER M.DIVERSUS

No: 10732.0794 FIG. 10.8

491141

SAGASCO Resources Ltd.



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	1.3 – 2.6%
	>2.6%

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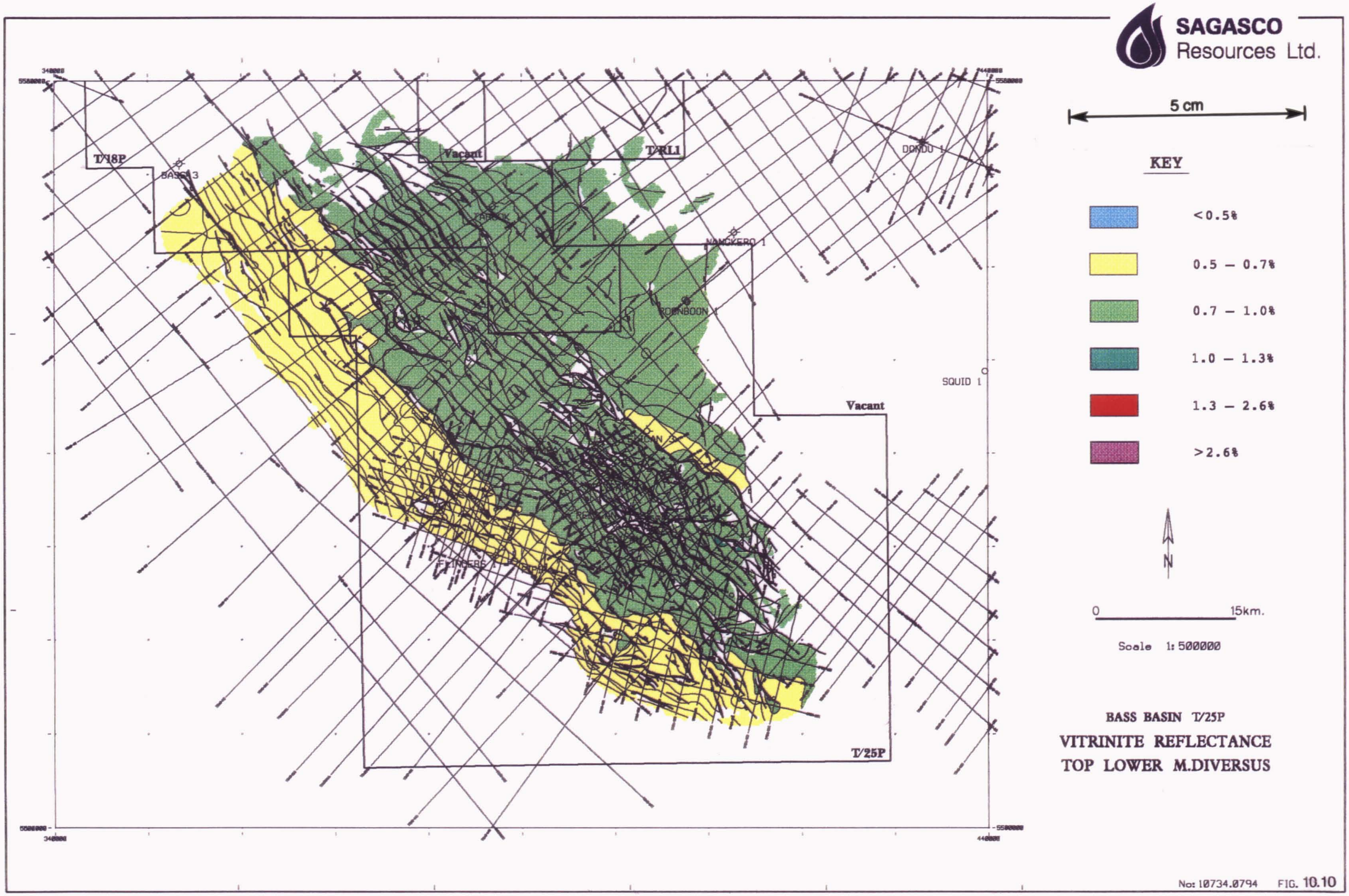
Scale 1: 500000

BASS BASIN T/25P

VITRINITE REFLECTANCE
TOP MIDDLE M.DIVERSUS

No: 10733.0794 FIG. 10.9

491142



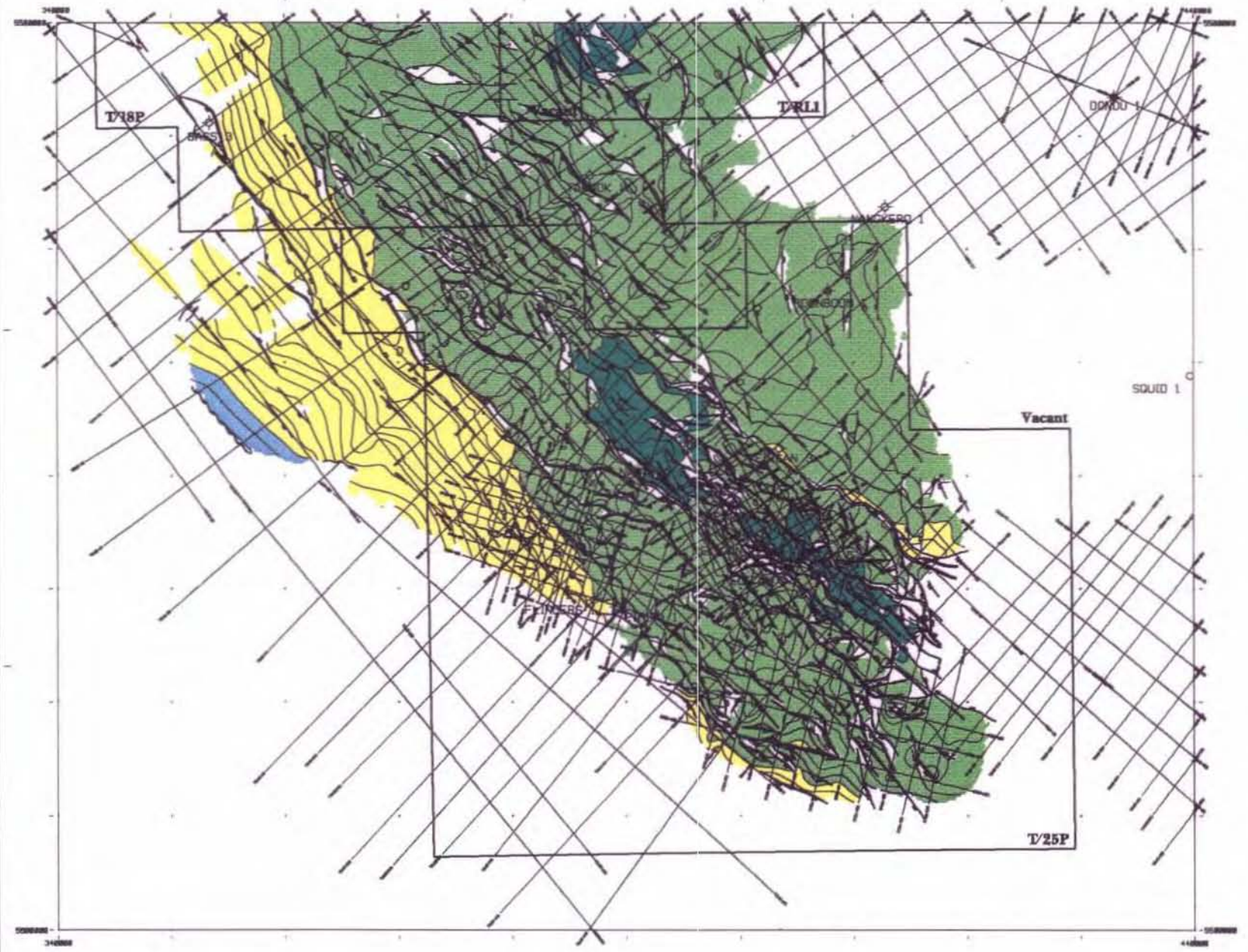
BASS BASIN T/25P

VITRINITE REFLECTANCE

TOP LOWER M.DIVERSUS

No: 10734.0794 FIG. 10.10

SAGASCO Resources Ltd.



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	1.3 – 2.6%
	>2.6%

N

0 15km.

Scale 1: 500000

BASS BASIN T/25P

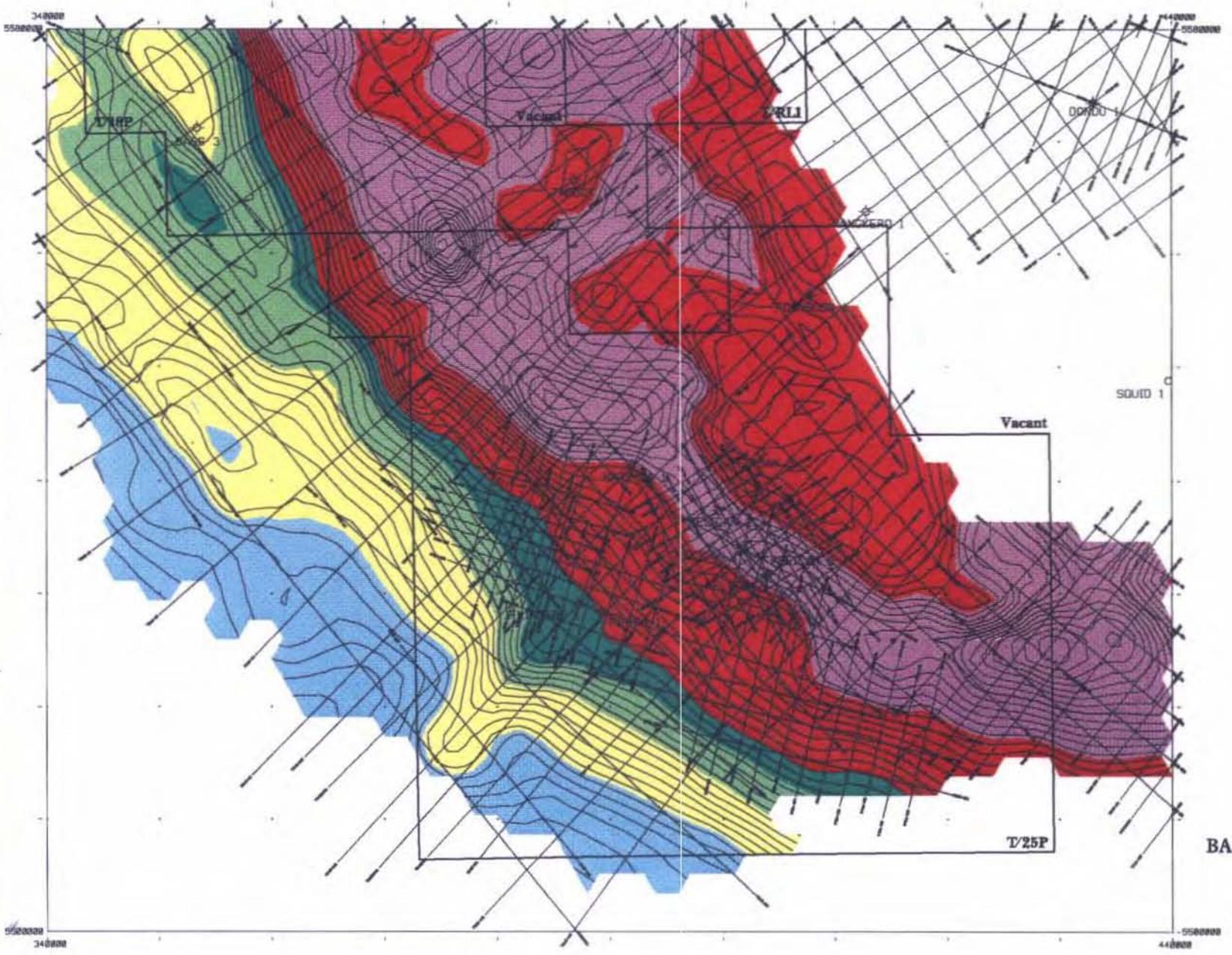
VITRINITE REFLECTANCE

TOP PALAEOCENE

No: 10735.0794 FIG. 10.11

491144

SAGASCO Resources Ltd.



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	1.3 – 2.6%
	>2.6%

N

0 15km.

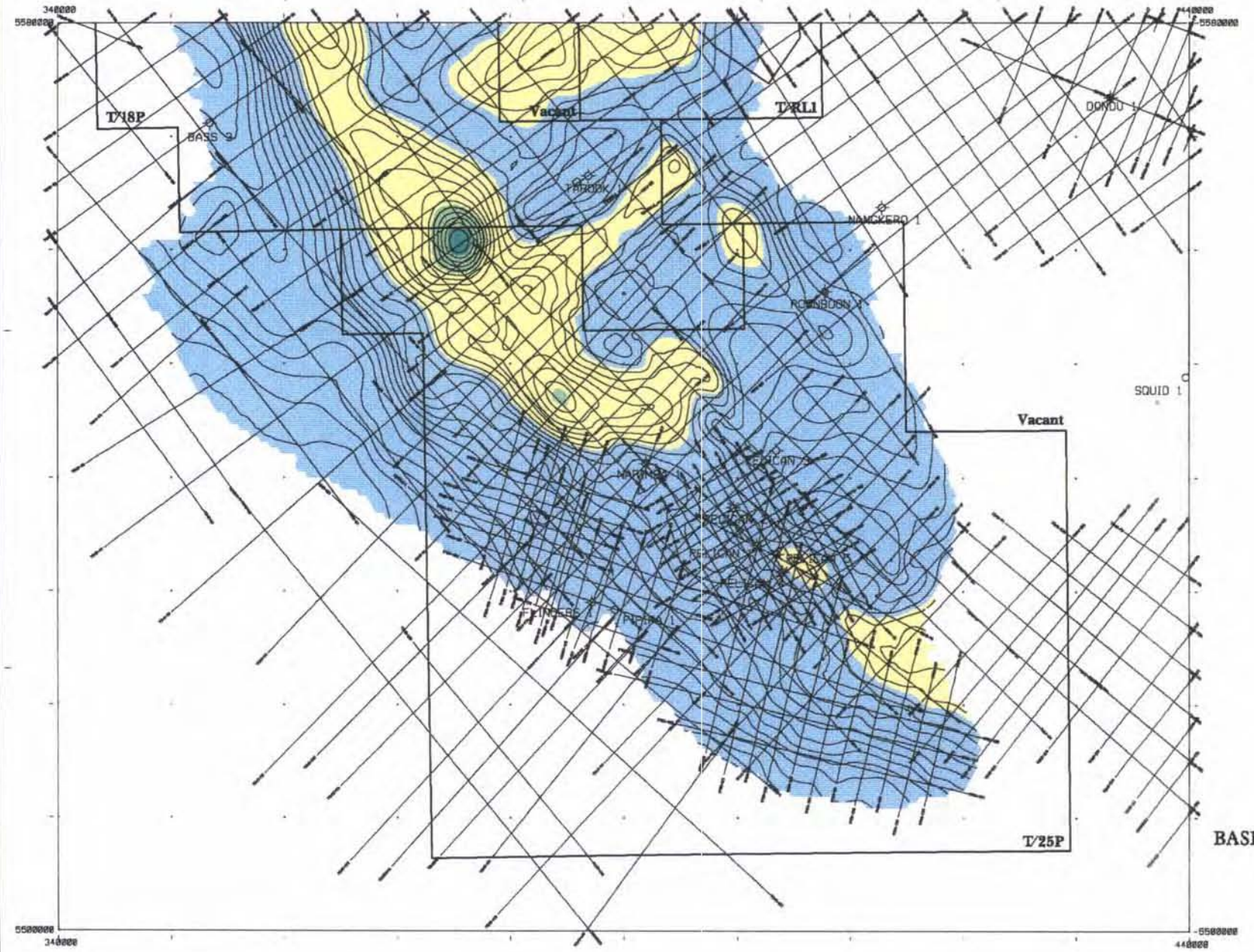
Scale 1: 500000

BASS BASIN T/25P

BASEMENT VITRINITE REFLECTANCE

No: 10649.0794 FIG. 10.12

SAGASCO Resources Ltd.



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	0.7 – 1.0%
	1.0 – 1.3%
	1.3 – 2.6%
	>2.6%

N

0 15km.

Scale 1: 500000

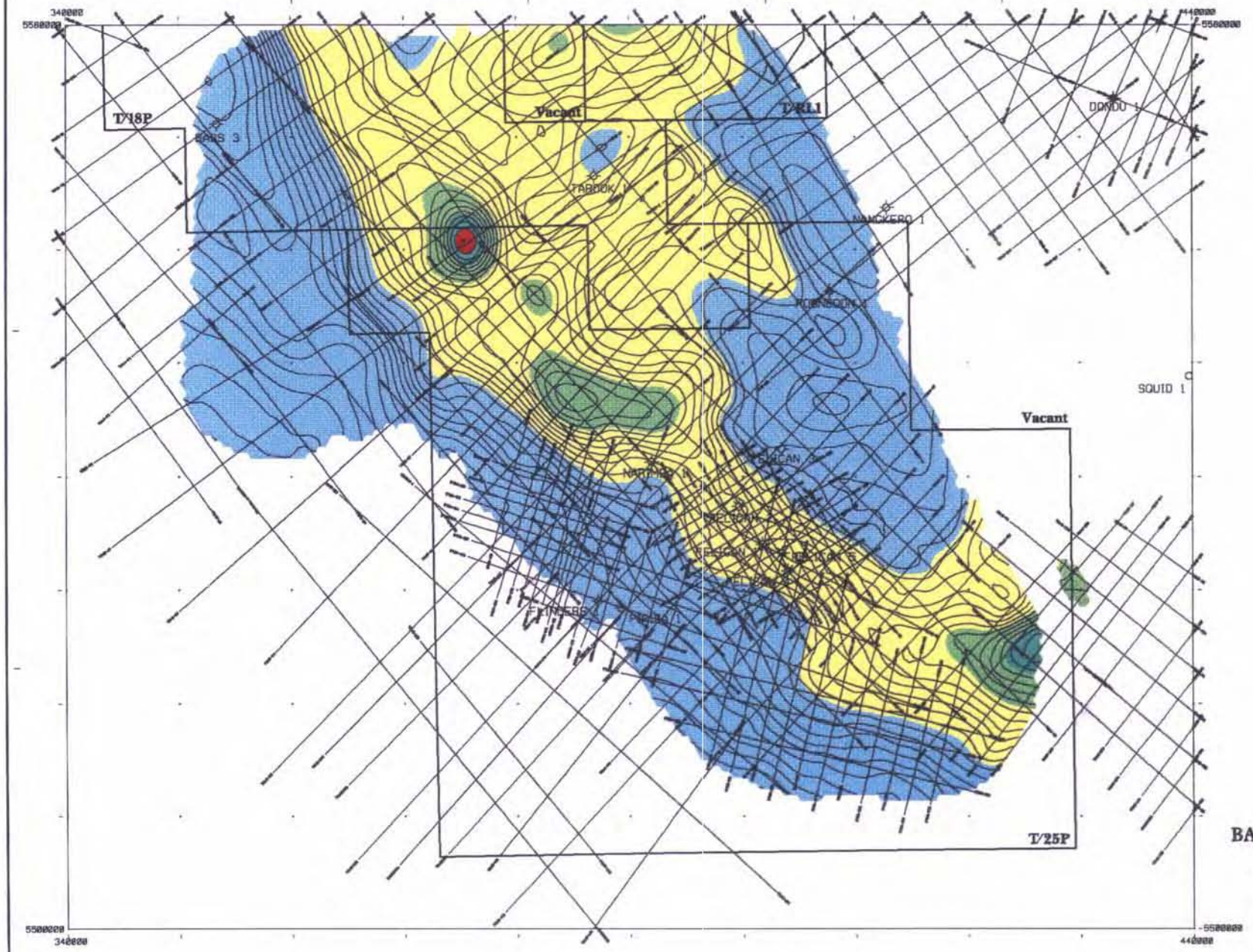
BASS BASIN T/25P

BASEMENT VITRINITE REFLECTANCE AT TOP PALAEOCENE TIME

Nat 10655.0794 FIG. 10.13

491146

SAGASCO Resources Ltd.



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	1.0 – 1.3%
	1.3 – 2.6%
	>2.6%

N

0 15km.

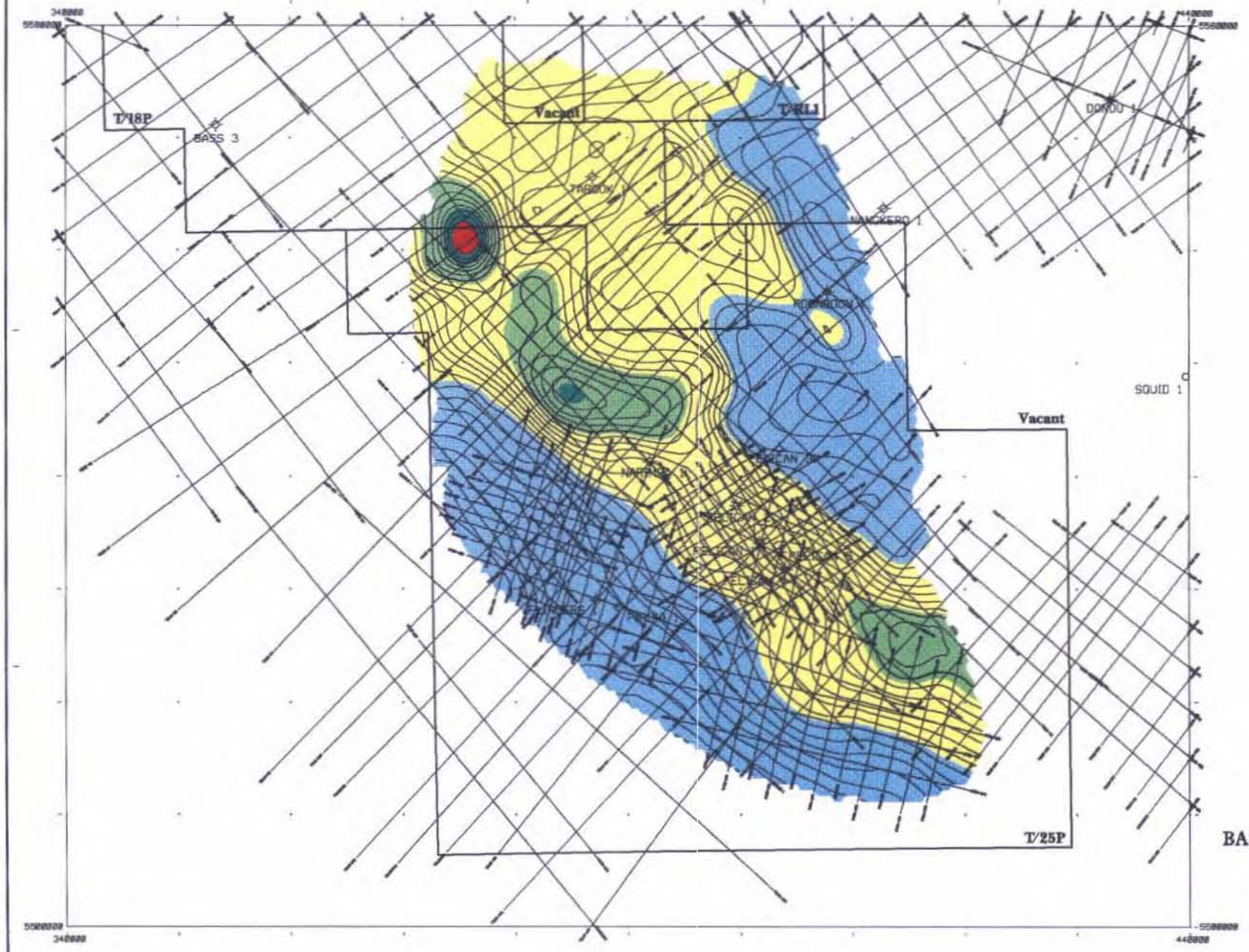
Scale 1: 500000

BASS BASIN T/25P

BASEMENT VITRINITE REFLECTANCE AT TOP MIDDLE M.DIVERSUS TIME

No: 10654.0794 FIG.10.14

SAGASCO Resources Ltd.



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	1.0 – 1.3%
	1.3 – 2.6%
	>2.6%

N

0 15km.

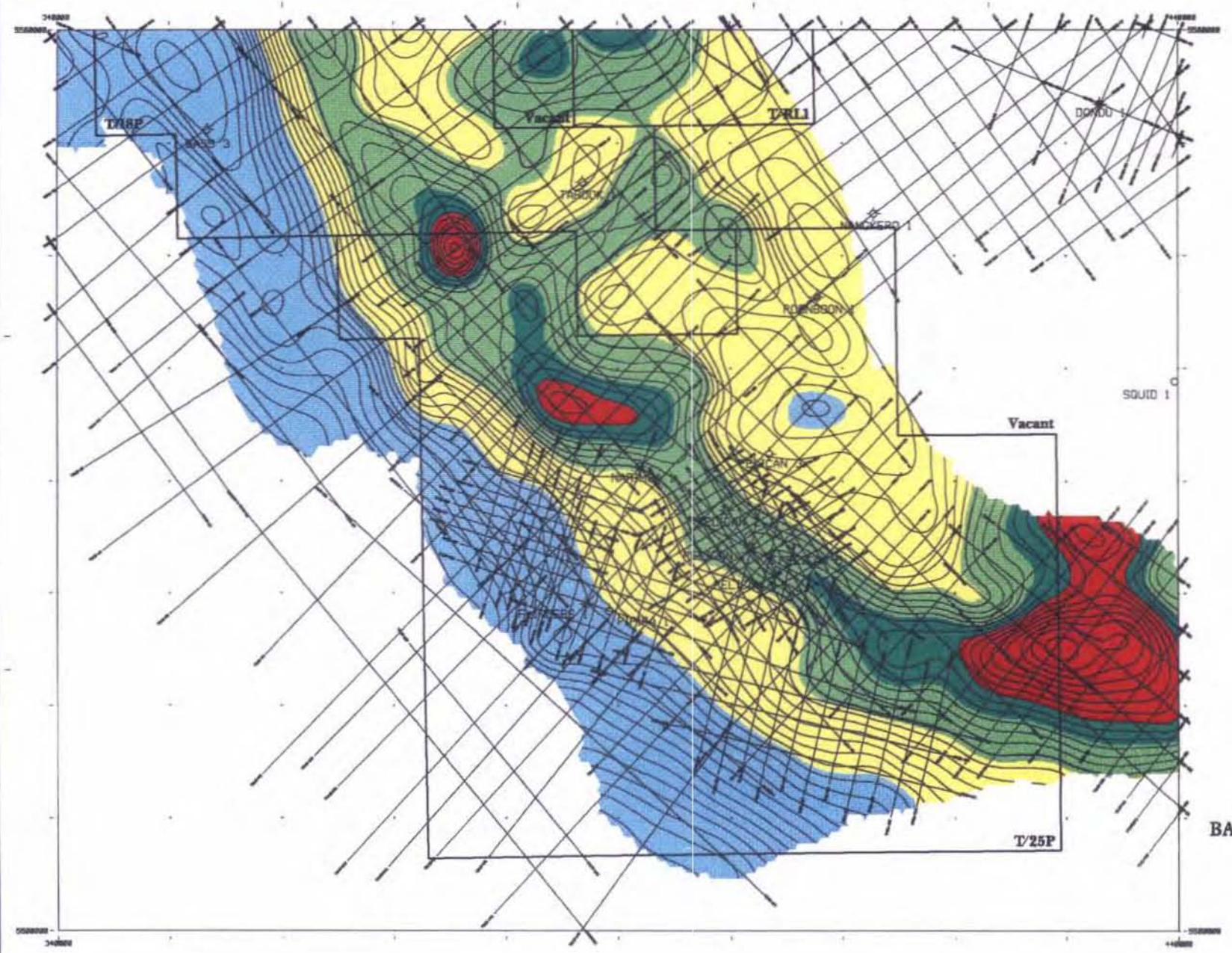
Scale 1:500000

BASS BASIN T/25P
BASEMENT VITRINITE REFLECTANCE
AT TOP UPPER M.DIVERSUS
TIME

Nos 10653.0794 FIG.10.15

491148

SAGASCO Resources Ltd.



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	0.7 – 1.0%
	1.0 – 1.3%
	1.3 – 2.6%
	>2.6%

N

0 15km.

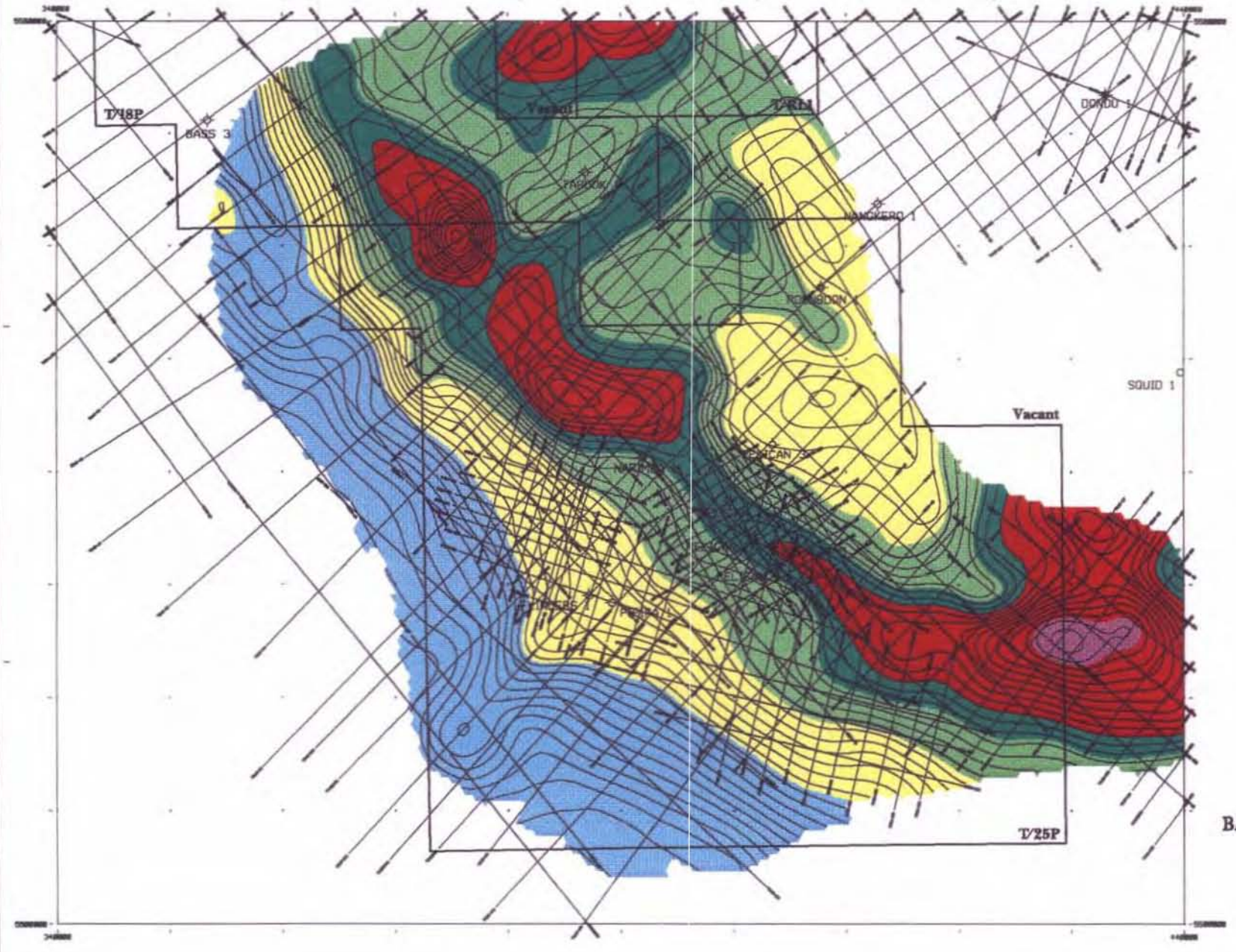
Scale 1: 500000

BASS BASIN T/25P

BASEMENT VITRINITE REFLECTANCE AT TOP DEMON'S BLUFF TIME

Nat 10652.0794 FIG. 10.16

SAGASCO Resources Ltd.



5 cm

KEY

	<0.5%
	0.5 – 0.7%
	0.7 – 1.0%
	1.0 – 1.3%
	1.3 – 2.6%
	>2.6%

N

0 15km.

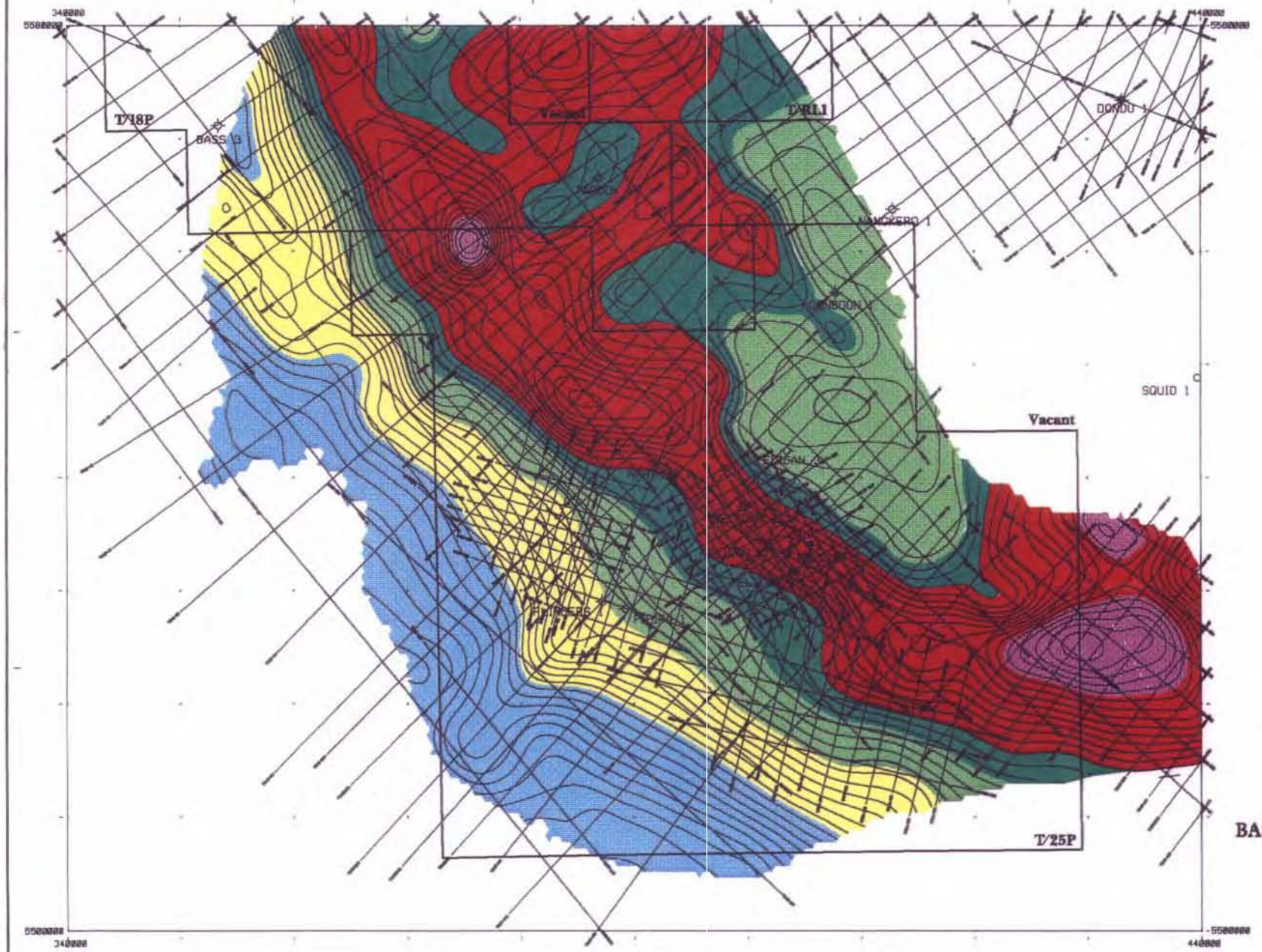
Scale 1: 500000

BASS BASIN T/25P

BASEMENT VITRINITE REFLECTANCE AT LATE OLIGOCENE TIME

Nat 10651.0794 FIG. 10.17

SAGASCO Resources Ltd.



5 cm

KEY

	<0.5%
	0.5 – 0.7%
	0.7 – 1.0%
	1.0 – 1.3%
	1.3 – 2.6%
	>2.6%

N

0 15km.

Scale 1: 500000

BASS BASIN T/25P

BASEMENT VITRINITE REFLECTANCE AT LATE MIOCENE TIME

Nat 10650.0794 FIG. 10.18

The area mapped covers most of T/25P and the southern portion of T/18P which includes the Southwest Ramp, Pelican Trough and Poonboon Platform structural provinces. The depth-maturity parameters used in constructing these maps are tabulated (Table 10.1) and were mostly derived from the Pelican Deep Maturity Model. The results from these maps are further discussed in Sections 10.11 and 10.12.

The maturity maps were generated from seismic two-way time maps using calculated maturity profiles and a simple conversion based on a time depth curve from the Pelican 5 checkshot survey. The Pelican 5 time-depth curve is considered a good representation for all the Pelican Field, and most T/25P wells. Time depth relationships on the Poonboon Platform are slightly shifted but an error less than 100m is tolerable given the regional distribution of the well data and the error bars associated with vitrinite reflectance data.

10.10 Kinetic Calculations and Modelling

The kinetic (or Tissot-Espitalié) method has been employed in this study to predict hydrocarbon evolution. This technique, unlike the traditional TTI method (Lopatin 1971, Waples 1980), calculates multiple parallel reactions that occur as organic matter undergoes degradation to hydrocarbons. Each chemical reaction has its own kinetic parameters: reaction fraction (kerogen percentage with respect to activation energy), activation energy (energy required for bond rupture) and Arrhenius's constant (frequency factor) (Platt River Inc., 1989).

Several kinetic models have been developed. Tissot and Espitalié (1975) used a model to convert kerogens directly to oil. Further development of the kinetic approach by the Institut Francais du Pétrole predicted that kerogen will be converted to oil and then to gas and residues. The kinetic basin model used in this study simultaneously converts kerogens to oil and gas, then oil is transformed into gas and residues (Transformation Ratio Plots: Section 10.12).

TABLE 10.1

T/25P MATURITY MAP PARAMETERS

PELICAN TROUGH MODEL*

Vitrinite Reflectance %	Approximate Depth (metres)	Two-way Travel Time (msecs)	Maturity Windows	Colour Code (on map)
< 0.5%	0-1600	0-1371	Immature	light blue
0.5-0.7%	1600-2500	1371-1943	Marginally Mature (onset early oil)	yellow
0.7-1.0%	2500-3250	1943-2330	Mid Mature (oil)	light green
1.0-1.3%	3250-3800	2330-2618	Late Mature (oil)	dark green
1.3-2.6%	3800-5500	2618-3450	Main Gas Generation	red
> 2.6%	> 5500	> 3450	Over-Mature	purple

Note: The main depth-maturity parameters were derived from the Pelican Trough, however maturity maps were re-checked for consistency and accuracy by Ro % data from other Bass Basin wells such as Flinders 1, Poonboon 1, Pipipa 1, Pelican 3 and 5.

Hydrocarbon generation was modelled using the kinetic parameters for standard Type II and III kerogens taken from the work done at LLNL (incorporated in the BMOD® program). Units that appear to have the potential to generate significant amounts of hydrocarbons from the shales are:

1) Upper Eocene (albeit immature)
2) Lower Eocene
3) Palaeocene
4) Cretaceous

10.11 Definition of Hydrocarbon Generation Windows and Mature Areas

Whether or not source rocks have actually generated and expelled significant quantities of hydrocarbons in the Pelican Trough is predominantly a function of their present day maturity.

Present-day maturity maps Figures 10.7 to 10.12 have been used to delineate areas of active oil and gas generation in the Pelican Trough. The hydrocarbon generation windows modelled for the study area are outlined in Table 10.1 and illustrated by the Schematic Section through the T/25P permit (Figure 10.19).

On the flanks of the Pelican Trough the Ro data (as Flinders 1, Figure 10.4) indicate that sediments are immature (< 0.5% Ro max) down to about 1750 metres (Upper *M.diversus* level). The top of the main oil generation window (~ 0.7% Ro max) is located at 2300 metres depth (Palaeocene). The section never reaches the peak to late mature oil or main gas generation phase.

Towards the centre of the trough at Pelican 5 the vitrinite reflectance curve (Figure 10.3) indicates the sediments are immature (Ro < 0.5%) down to about 1800 metres (Top EVCM). Eocene sediments within the interval 1800-2500 metres depth are marginally mature for oil. The top of the main oil window at Pelican 5 is located at 2500 metres depth in the lower Eocene. At total depth (4200 metres) the Cretaceous section has attained optimum maturity for gas generation (Ro = 1.3-1.6%).

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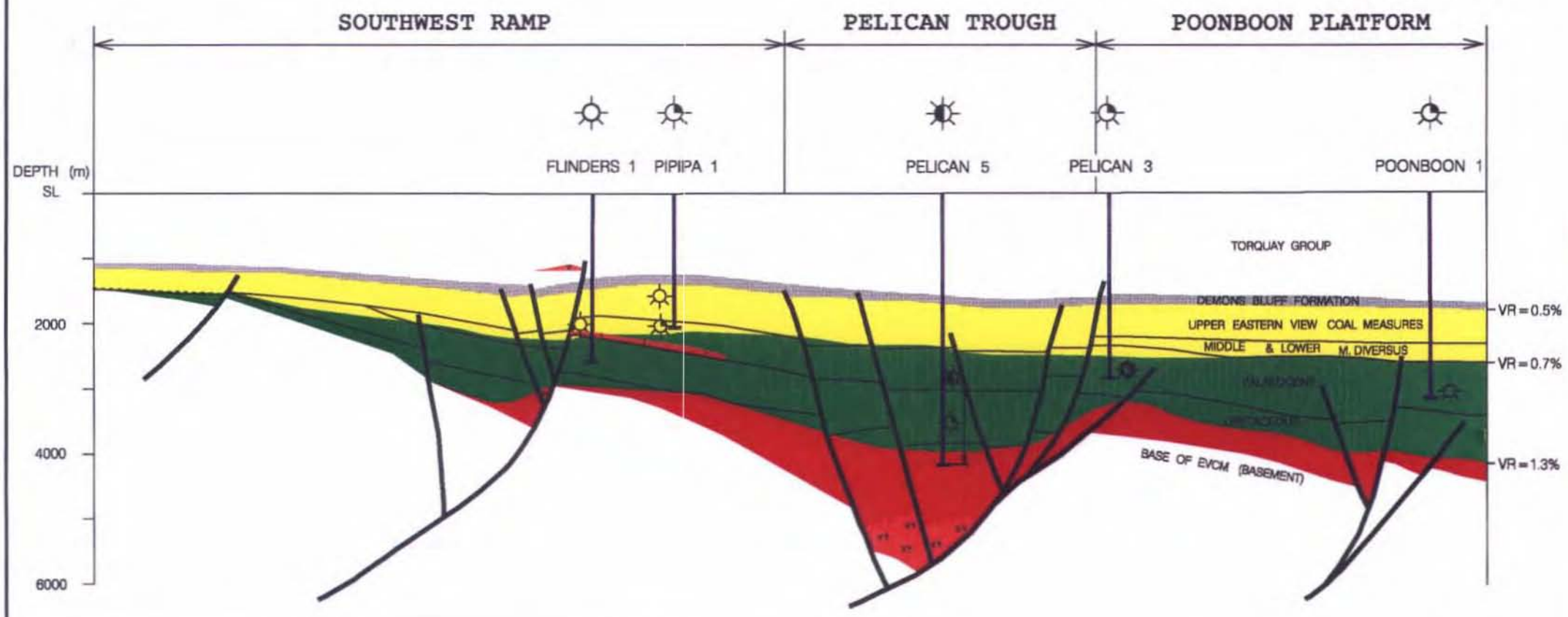

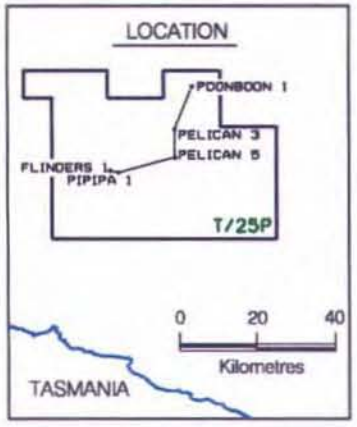

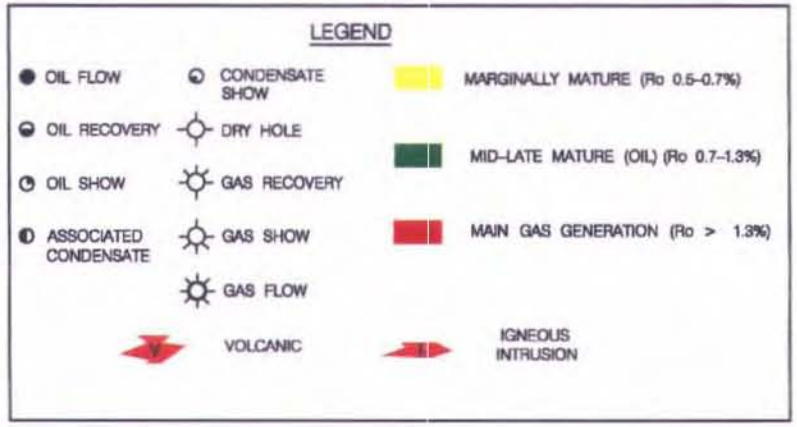

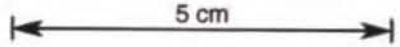

BASS BASIN – TASMANIA

T/25P

SCHEMATIC CROSS SECTION STRUCTURE AND MATURITY

No: 10854.0794 FIG. 10.19

The Pelican Deep Model (Figure 10.20) shows that with depth and increasing maturity, the sediments trend toward over-maturity. At depths greater than 5500 metres (Cretaceous), Ro (max) values exceed 2.6%, indicating overmaturity. Sediments at these depths within the centre of the trough have already passed through the oil and gas generation window.

10.12 Timing and Generation

Generation of hydrocarbons has been triggered by various events in the burial history of the sediments within the Pelican Trough (Figure 10.21 and 10.22).

On the margins (Flinders Model), hydrocarbon generation is presently immature to early mature (Figure 10.23). The onset of early generation has occurred most recently around 22 MMYBP, coinciding with a period of mid-Miocene tectonism (Figure 10.24).

Progressing down into the trough (Figure 10.25), the deepest sections are at present overmature, indicating all the hydrocarbons present have been expelled most probably after middle *M.diversus* time (~50 MMYBP).

The Top *L.balmei* is presently at a mature oil generating stage, of which only 60% of the formations total kerogen has been transformed to hydrocarbons (Figure 10.26). The Cretaceous section at the Pelican 5 location is still within the main gas generation phase.

The palaeo reconstruction of basement maturity (Figures 10.13 to 10.18) shows that by the end of Demon's Bluff deposition a significant proportion of the deepest sediments of T/25P were mature for hydrocarbon generation. In the depths of the Pelican Trough some sediments had even begun gas generation. Fortunately all structures identified as leads in this study were in place as possible traps by this time should vertical migration of hydrocarbons have commenced. Cretaceous trapping geometries, such as the pinchout plays on the Southwest Ramp, could have been receiving laterally migrated hydrocarbons during the Demon's Bluff Formation's deposition.

PELICAN DEEP MODEL

Kinetic History

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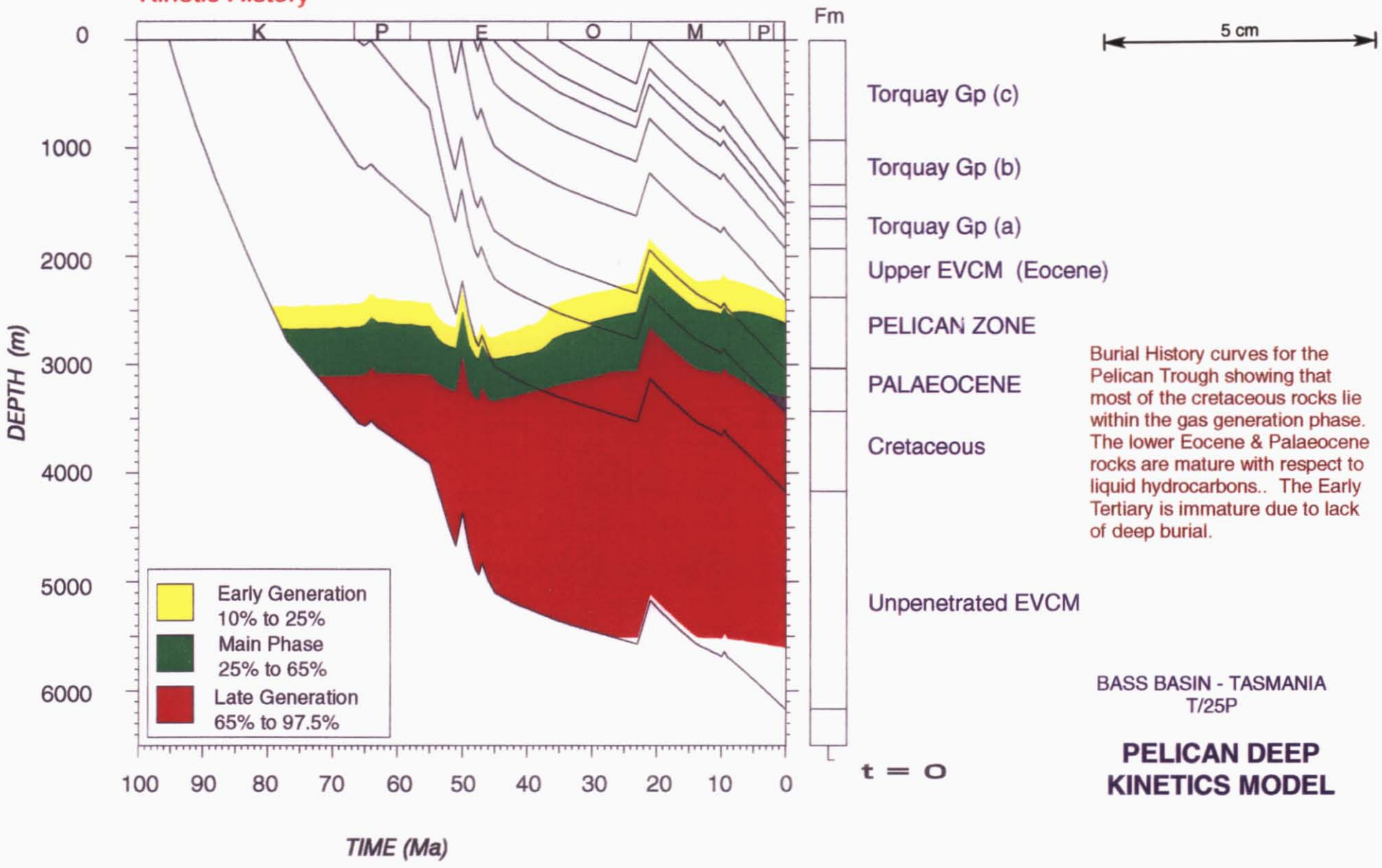

Burial History curves for the Pelican Trough showing that most of the cretaceous rocks lie within the gas generation phase. The lower Eocene & Palaeocene rocks are mature with respect to liquid hydrocarbons.. The Early Tertiary is immature due to lack of deep burial.

BASS BASIN - TASMANIA
T/25P

PELICAN DEEP KINETICS MODEL

AMTCM11.PRS Fig. 10.20

5 cm

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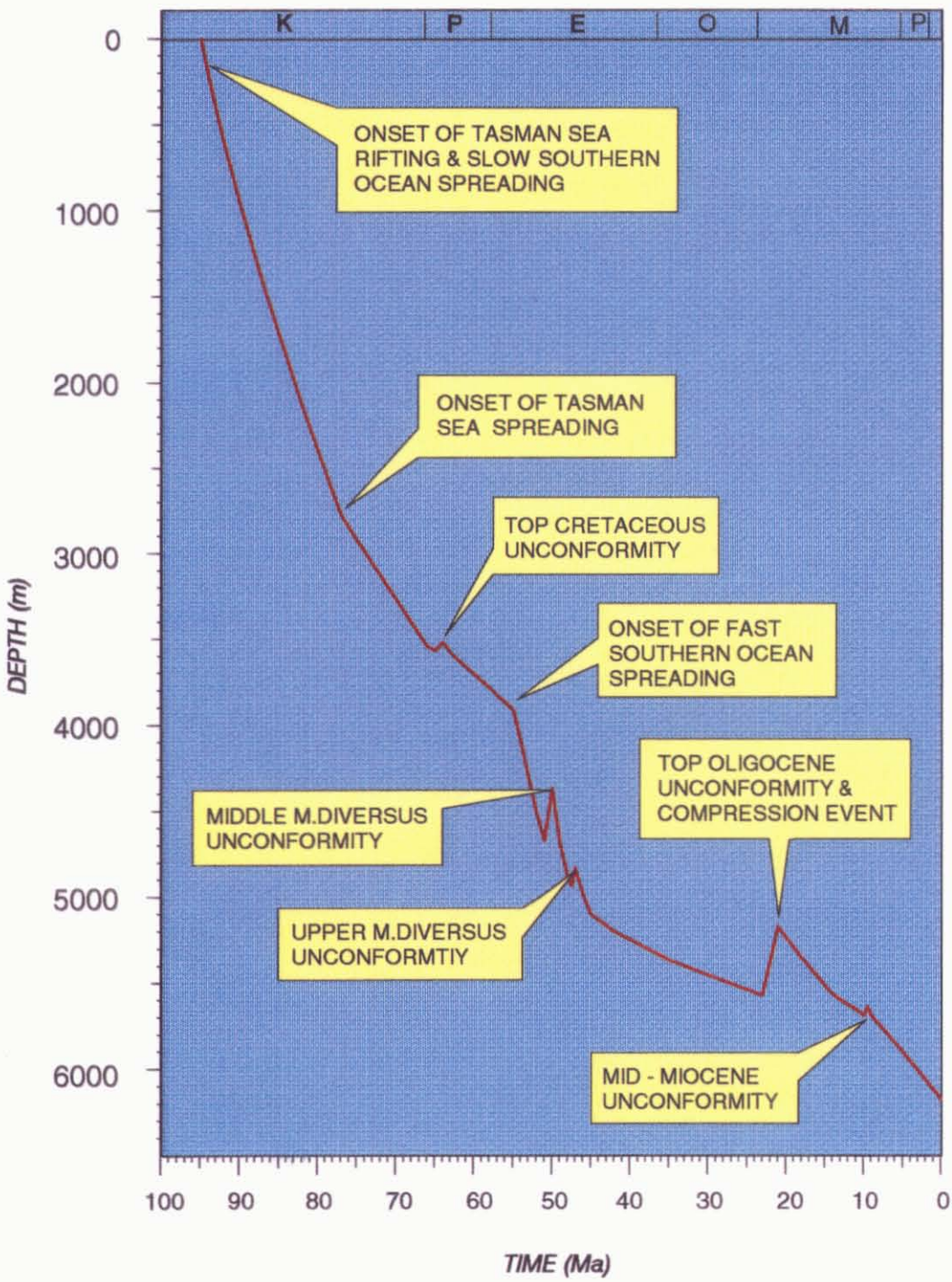
PELICAN TROUGH (BASED ON PELICAN 5)



BASS BASIN
T/25P

PELICAN TROUGH SUBSIDENCE CURVE

DKT25P.PRS Fig. 10.21

5 cm

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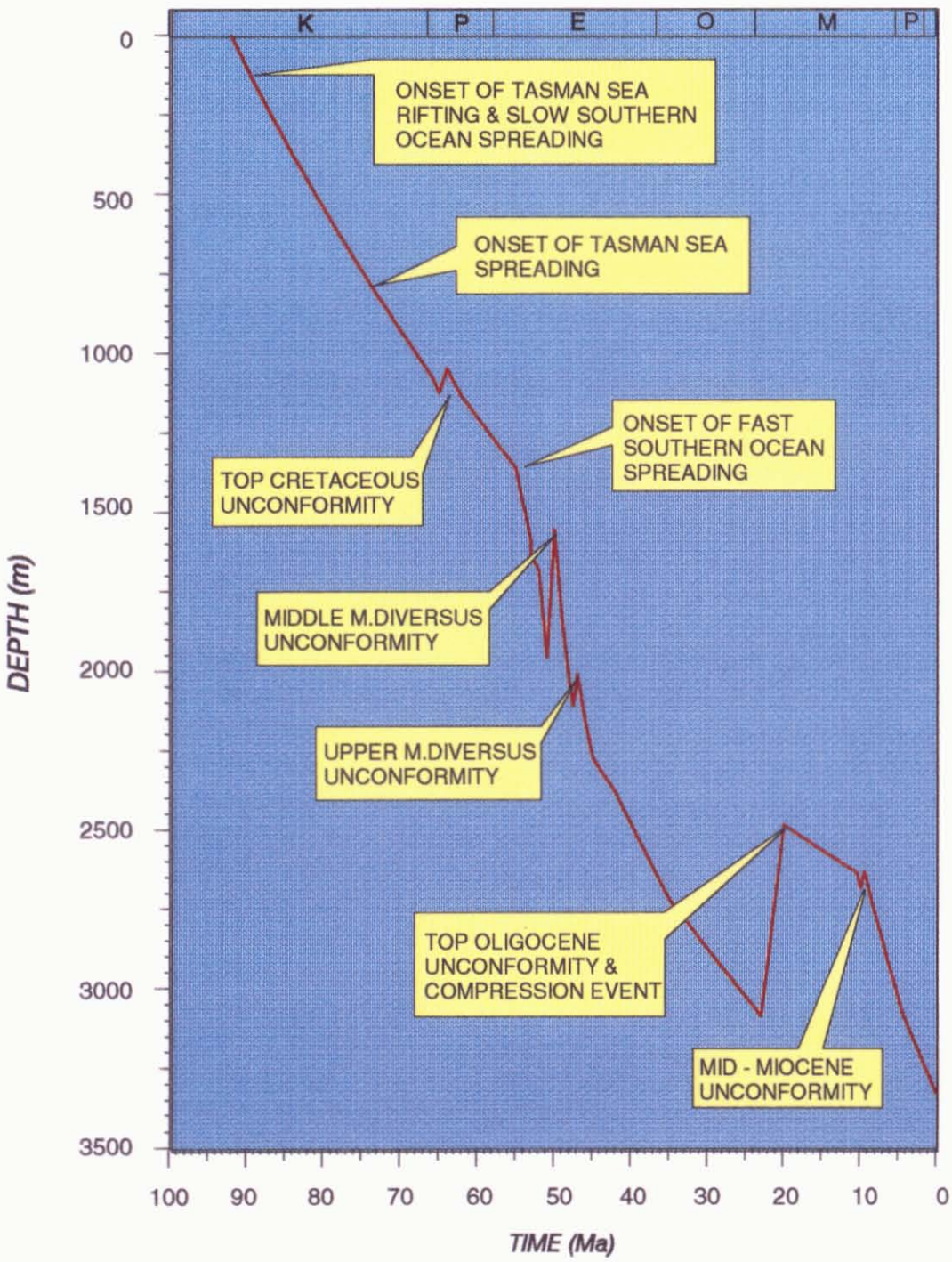
SOUTHWEST RAMP (BASED ON FLINDERS 1)



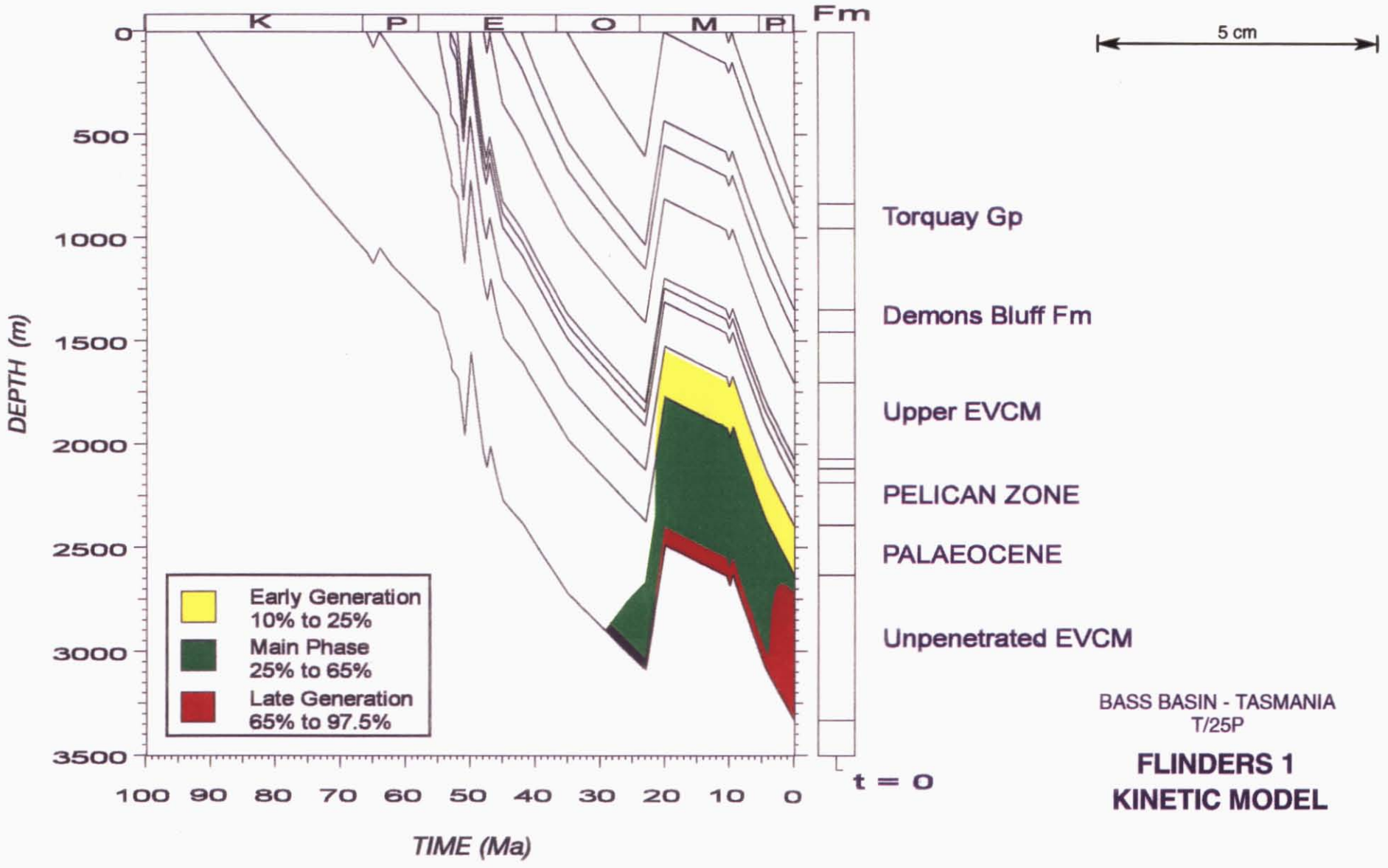
BASS BASIN
T/25P

SOUTHWEST RAMP SUBSIDENCE CURVE

DKT25P.PRS Fig. 10.22

SAGASCO Resources Ltd.

FLINDERS 1



BASS BASIN - TASMANIA
T/25P

FLINDERS 1
KINETIC MODEL

AMFLI194.PRS Fig. 10.23

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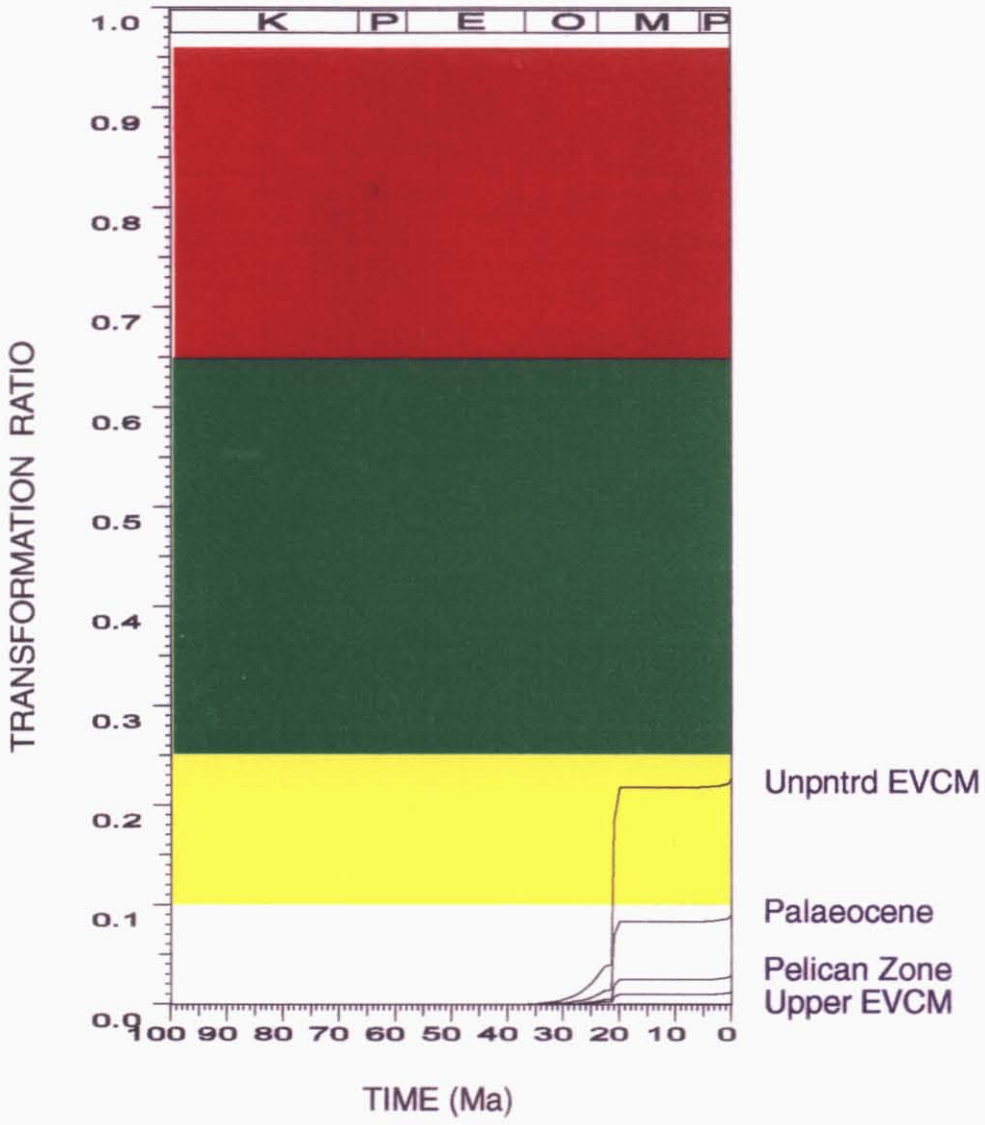
FLINDERS 1



5 cm

- Transformation ratio top
- Early Generation10% to 25%
- Main Phase 25% to 65%
- Late Generation 65% to 97.5%

BASS BASIN - TASMANIA
T/25P

FLINDERS 1
TRANSFORMATION RATIO VERSUS TIME

AMFLI194.PRS Fig.10.24

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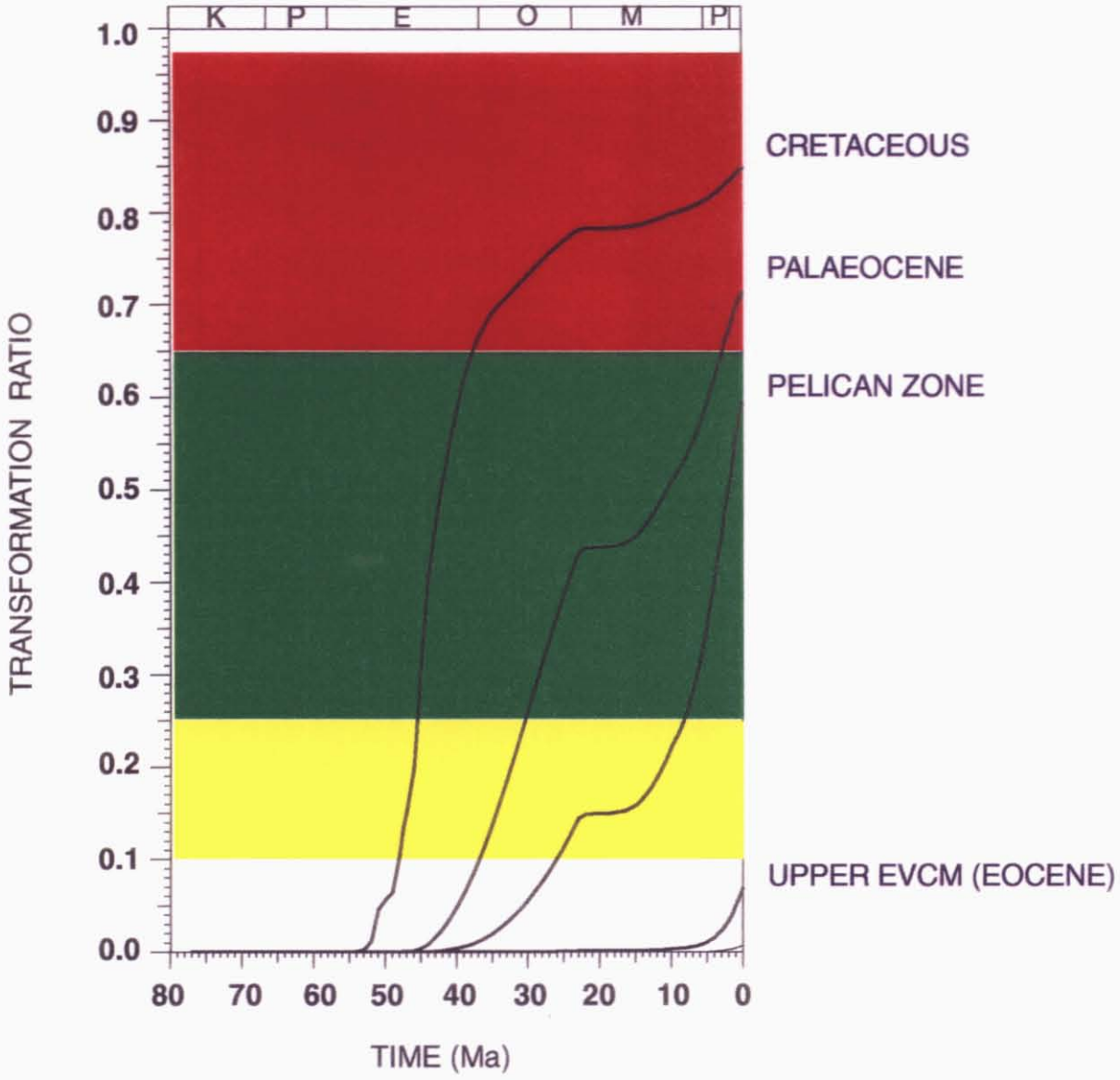
PELICAN 5

TRANSFORMATION RATIO



5 cm

- Transformation ratio bottom
- Early Generation 10% to 25%
- Main Phase 25% to 65%
- Late Generation 65% to 97.5%

BASS BASIN - TASMANIA
T/25P

PELICAN 5
TRANSFORMATION RATIO
VERSUS TIME

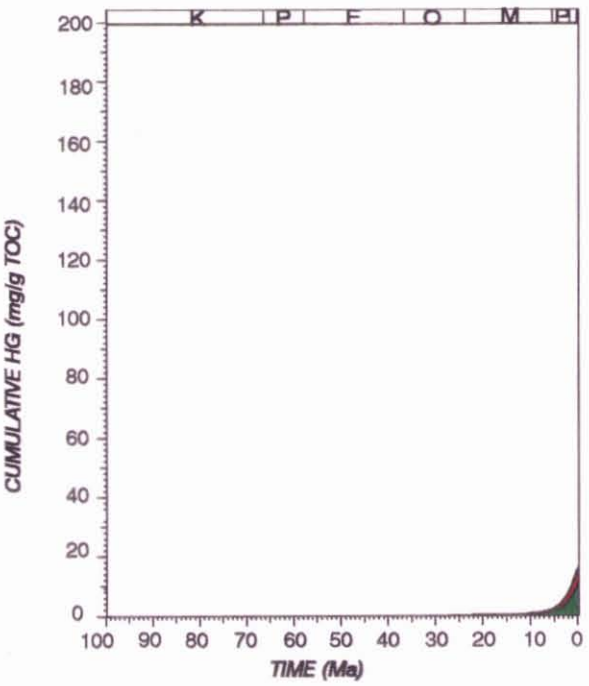
AMTCM11.PRS Fig. 10.25

5 cm

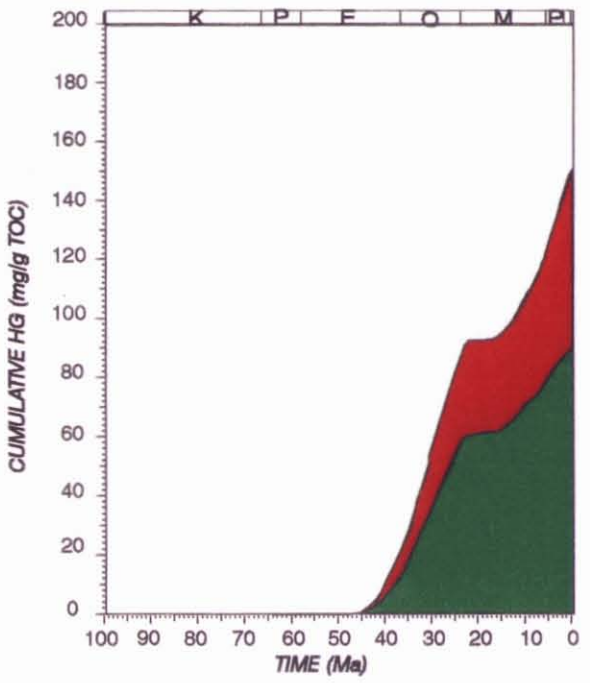
491162

SAGASCO Resources Ltd.

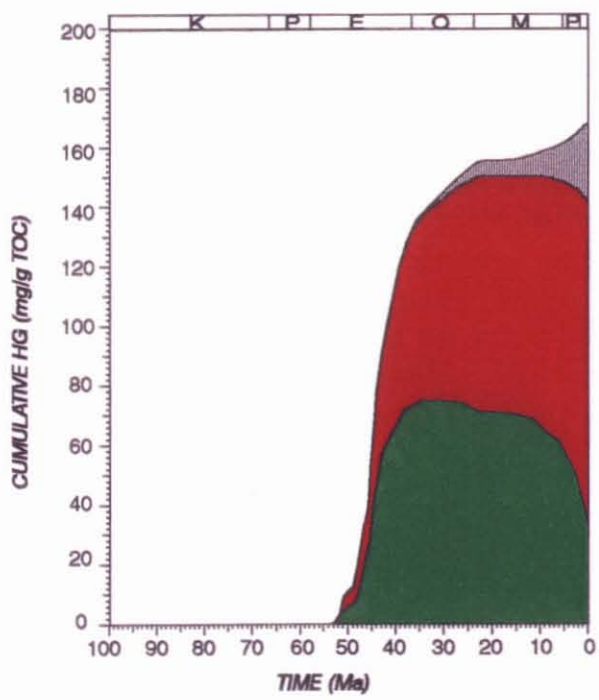
UPPER EVCM (A)



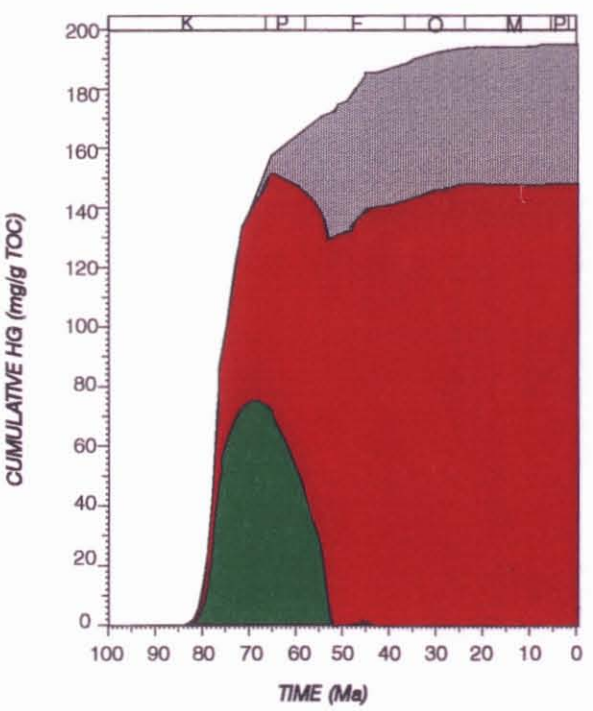
PALAEOCENE

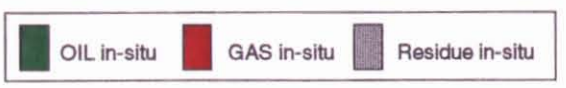


CRETACEOUS



UNPENETRATED SECTION





BASS BASIN - TASMANIA

T/25P

HYDROCARBON GENERATION - PELICAN TROUGH & TIMING

AMHYD014.PRS Fig. 10.26

By the end of the Oligocene mature deep sediments occupied nearly a third of the Permit's area representing a vast volume of generative and explusing source rock. Some rocks were overmature by this age but most were still in the oil and gas preservation window.

At Late Miocene time two thirds T/25Ps area had deep sediments mature for hydrocarbon generation split half between oil and gas maturity. An increased amount of the deepest sediments had moved into the overmature window.

At the present day the deepest sediments in T/25P are mostly gas generative or overmature. Significantly, perhaps eighty percent of the Permit has sediments in the 1900-2600m depth range which representing the oil generation/preservation window. Good source potential exists at most levels so it appears that a vast area of T/25P is very prospective provided that robust traps and good reservoir quality can be established.

10.13 Summary

The source rock and maturation study indicates high TOC values are pervasive throughout the Eastern View Coal Measures within the Pelican Trough. A summary of the results is presented in Figure 10.27. The study indicates that the upper EVCM (*N.asperus* - upper *M.diversus*) is in general not mature for hydrocarbon generation. Thus potential reservoirs are likely to have been sourced from deeper within the trough (Palaeocene-Cretaceous sediments).

Hydrocarbon generation from late Cretaceous-Palaeocene sediments is believed to have developed shortly after the end of EVCM deposition, thus making it favourable for migration into structures developed during the Cretaceous and middle *M.diversus* rifting phases. Late Cretaceous-Palaeocene source rocks are presently oil-prone and oil mature.

The advanced maturity of the Cretaceous sediments preclude an accurate estimation of their original oil-source potential. In general, Cretaceous sediments are now post-oil generation and contain only residual gas-prone Type III kerogen.

SOURCE ROCK POTENTIAL – T/25P BASS BASIN

SAGASCO Resources Ltd.

ORGANIC RICHNESS / HYDROCARBON QUALITY

TOC

TOTAL ORGANIC CARBON %

0–0.5	0.5–1.0	1.0–2.0	2.0–5.0	>5.0
POOR	FAIR	GOOD	V.GOOD	EXCELL.

S1

FREE HC RICHNESS mg/g

0–0.5	0.5–1.0	1.0–2.0	2.0–5.0	>5.0
POOR	FAIR	GOOD	V.GOOD	EXCELL.

S2

OIL & GAS GENERATING CAPACITY mg/g

<2.5	2.5–5.0	5–10	>10	>>10
POOR	FAIR	GOOD	V.GOOD	EXCELL.

S1+S2

HC Yield mg/g

0–0.5	0.5–1.0	1.0–2.0	2.0–5.0	>5.0
POOR	FAIR	GOOD	V.GOOD	EXCELL.

HYDROCARBON TYPE

S1 / S2

HC TYPE

0–3	3–5	>5
GAS	MIXED	OIL

Van Krevelen

KEROGEN TYPE

KEROGEN TYPE		
1	2	3

Hydrogen Index

GAS	MIXED	OIL
<150	150–250	>250

HYDROCARBON MATURITY *

PELICAN DEEP

FLINDERS 1 (FLANK)

IMMATURE	OIL: EARLY MATURE	OIL: MID MATURE	OIL: LATE MATURE	GAS: MATURE	OVER MATURE

PI	TMAX °C	Ro
Top Oil Window	430–445	0.6
Base Oil Window	465	1.35

Main oil generation 0.7 – 1.0 Ro%

SOURCE POTENTIAL RATING

POOR	FAIR	GOOD	V.GOOD	EXCELL.

AGE / STRATIGRAPHIC UNIT	
EOCENE	Top EVCM – base *N.asperopolus* (Units 1 & 2)
EOCENE	Upper to Lower *M.diversus* (Units 3 & 4)
PALAEOCENE	*L.balmei* (Unit 5)
CRETACEOUS	*T.longus – T.lillei* (Unit 6)

5 cm

OR-0393

No:10573.0794 Fig. 10.27

This distribution of shows around the Cormorant and Pelican Troughs suggest vertical migration is the key pathway for hydrocarbon movement. Structures close to the graben depocentres that are fault bounded (tilted fault blocks) to allow vertical migration of deeper sourced hydrocarbons would provide good prospects. However, structures toward the basin edge cannot be discounted as lateral migration may be less tortuous than the compartmentalised tilted-fault block play-types.

11 PROSPECTIVITY

11.1 Play Types

Regional seismic mapping (Chapter 5) has identified 22 leads. These leads are rated as strong leads (requiring minimal seismic data to mature them to prospect status), leads (requiring infill seismic data to confirm closure) and weak leads (which require additional regional seismic data to confirm the presence or size of the structures). No drillable prospects are identified in this study, but it is hoped that some of the leads will be promoted to prospect status following interpretation of newly reprocessed seismic data and in particular data from the Rocky Cape Seismic Survey.

The leads identified can be categorised into the following six play types:

- High side fault closures against NW-SE trending faults
- High side fault closures bounded by NW-SE trending faults and relay ramp faulting in the strike direction
- Low side fault closures against NW-SE trending faults (eg Clarke)
- Low side fault closures bounded by NW-SE trending faults and relay ramp faulting in the strike direction (eg Peron)
- Faulted anticlines
- Stratigraphic onlap/truncation/pinchout plays.

Potential reservoirs occur at all levels within the EVCM, although the most prospective targets occur in the middle *M.diversus* and Palaeocene. Other targets occur at the top of the EVCM beneath the regional sealing unit of the Demons Bluff Formation, the upper *M.diversus* which contains abundant quality reservoir but its prospectivity is low because of tortuous vertical migration routes and the integrity of its intraformational seals, and in the Cretaceous part of the basal EVCM, which is deeply buried in most of the permit except near the basin margin.

Extensive wireline testing in Pelican 1, 2 and 4, cased hole testing in Pelican 5, source rock data and maturity modelling has identified the Pelican Trough as an established source of condensate-rich gas. Therefore the prospects most favoured occur in, or are adjacent to, the Pelican Trough.

A review of the source rock data from T/25P shows that there is the possibility of early oil charge from Cretaceous source rocks as well as from more recent migration from younger EVCM sediments. Significant areas of the upper EVCM source material occurs in the oil window, and therefore whilst gas is considered to be the most likely hydrocarbon charge from Palaeocene and deeper source rocks, oil discoveries are possible, particularly in the shallower targets.

Stratigraphic plays are not included within the inventory of leads as closures have yet to be mapped. However, during interpretation of the seismic data several possible play types were recognised which may warrant further investigation. These stratigraphic plays include:

- Subcrop of *M.diversus*, Palaeocene and Cretaceous units on the southwestern margin
- Onlap of the Palaeocene and Late Cretaceous onto Early Cretaceous
- Onlap of Palaeocene and Cretaceous sediments onto basement.

11.2 Prospects and Leads

A detailed inventory of the leads identified has been compiled. Leads have been named using the names of geographical features from Tasmania. The inventory which follows this introduction consists of basic data, a discussion of risk factors, example seismic sections, maps and reserve calculations for each lead. A simple risking of the reserve calculations has also been performed in order to give a preliminary ranking. Four risk categories were used to determine the total geological risk associated with each lead, these are:

1 Source - proximity to mature source area, migration route, timing of charge in relation to structure, oil verses gas

2 Reservoir - reservoir distribution
reservoir quality and quantity

3	Seal	-	top and lateral sealing mechanisms reactivation of bounding faults
4	Structure	-	complexity of structure adequacy of seismic control possibility of alternative interpretations.

Volumetric calculations are based on closures established on the regional seismic two-way time maps generated for this study. Depth conversions were made using a time-depth relationship established from checkshot data at Pelican 5. This gradient from the deepest well in the Pelican Trough is a very good approximation of a best fit curve for all T/25P wells. A simple spreadsheet program was used to calculate the reserves, and all the spreadsheets are presented in this report.

Most sandstone targets in the EVCM are likely to be relatively thin in comparison to the areal and vertical closure. A thickness of 5-10 metres is typical for individual sandstones and therefore a simple slab volumetric model (area x net pay) was used. Area measurements are shown for all mapped closing contours so that the reader can investigate reserve estimates for closures smaller than the lowest closing contour.

All the reserve calculations use the same net pay thickness of 30 metres because of the uncertainty in predicting reservoir distribution within the sedimentologically variable and complex EVCM. Intraformational seals are likely within the EVCM and therefore it is considered that 30 metres of total net pay, in say three to six sandstones is a conservative estimate of potential pay. For example the Yolla Field contains approximately 34 metres of net pay, whilst some of the Pelican Field wells could contain considerably more. Also some of the plays are located in geological settings not previously drilled and could contain significantly more net pay than 30 metres. This would result in some of the smaller leads, documented here, being rated as more attractive exploration targets.

Porosity was determined using the regional porosity - depth data referred to in this report. Gas Formation Volume Factor (Bg) was determined for a gas fitting the composition of that produced in the flow from Pelican 5, DST 6, adjusted to the depth of the objective at each lead. Oil Formation Factor (Boi) is based on the following simple depth dependent relationship:

$$Boi = \frac{depth}{4750} + 1$$

A condensate yield of 100 BBLs/MMSCF is used for all the leads. The condensate yield from the Pelican Field wells from FIT and cased hole production test samples was approximately 135 -138 BBLs/MMSCF. At Yolla 1 the condensate yield is 68.6 BBLs/MMSCF.

Recovery factors of 85% for gas and 25% for oil are estimates.

Risked reserves were calculated using the absolute volumetric calculations described above at the lowest closing contour, multiplied by the total geological risk. This provides a rough method of ranking the prospects, and a more thorough approach using probability distributions and Monté Carlo sampling to calculate the reserves is recommended to be undertaken following mapping using the Rocky Cape Seismic Survey and reprocessed data.

The geographic distribution of the Leads is presented in Figures 11.1 to 11.4. Summary tables have been prepared (Tables 11.1 to 11.8) which show the calculated unrisked and risked sales gas and recoverable oil for all leads, included tables sorted by risked sales gas and risked recoverable oil for the middle *M.diversus* and Palaeocene closures.

Evaluation of the leads should recognise that many of the leads are located in adjacent fault compartments, so that whilst individual accumulations may not be economic there is often the possibility that smaller leads could become economic if production could be combined with an adjacent larger closure. Also some leads will probably change their status with more seismic control.

TABLE 11.1

UNRISKED SALES GAS (PJ) TO LOWEST CLOSING CONTOUR

LEAD	UPPER EVCM	UPPER *M.DIVERSUS*	MIDDLE *M.DIVERSUS*	PALAEOCENE
Actaeon	-	-	610.5	248.6
Actaeon-Tourville	-	-	-	1179.2
Adamson	-	-	122.7	193.6
Cape Barren	-	357.3	203.7	-
Clarke	-	-	4625.7	2275.5
Eddystone	-	-	475.3	464.3
Grindstone	-	-	125.8	183.6
Hilliard East	-	-	115.8	-
Hilliard West	-	-	111.7	-
Hilliard-Pelican 1, 5	-	-	545.0	-
Hilliard	-	-	-	316.6
Hunter	207.5	265.3	176.9	203.0
Lead G	-	-	87.6	70.7
Narimba West	-	163.5	93.9	-
Perkins	-	-	372.9	-
Perkins-Cape Barren	-	-	753.2	-
Peron			115.7	-
Peron East	-	-	-	27.5
Peron West	-	-	-	131.3
Poonboon North	-	-	259.3	-
Raoul East	-	-	-	79.4
Raoul West	-	-	-	96.2
Rochon	-	-	117.7	253.6
Rochon South	-	-	236.7	343.3
Surville	-	-	170.5	166.5
Tomahawk	-	-	55.2	-
Tourville	55.5	567.0	850.3	493.1
Tregaron	-	-	-	153.6
Veridian	-	-	-	634.6
Warrego	-	-	772.9	351.5

TABLE 11.2

RISKED SALES GAS (PJ) TO LOWEST CLOSING CONTOUR

LEAD	UPPER EVCM	UPPER *M.DIVERSUS*	MIDDLE *M.DIVERSUS*	PALAEOCENE
Actaeon	-	-	51.3	12.5
Actaeon-Tourville	-	-	-	26.4
Adamson	-	-	4.1	6.1
Cape Barren	-	5.0	21.4	-
Clarke	-	-	532.9	262.1
Eddystone	-	-	63.9	33.4
Grindstone	-	-	12.8	11.0
Hilliard East	-	-	15.6	-
Hilliard West	-	-	15.0	-
Hilliard-Pelican 1, 5	-	-	73.3	-
Hilliard	-	-	-	22.8
Hunter	37.2	20.4	6.8	6.1
Lead G	-	-	2.2	2.5
Narimba West	-	3.5	9.9	-
Perkins	-	-	39.2	-
Perkins-Cape Barren	-	-	63.3	-
Peron			4.9	-
Peron East	-	-	-	0.7
Peron West	-	-	-	5.0
Poonboon North	-	-	11.4	-
Raoul East	-	-	-	5.0
Raoul West	-	-	-	6.1
Rochon	-	-	6.2	9.6
Rochon South	-	-	19.9	14.4
Surville	-	-	14.9	7.0
Tomahawk	-	-	-	0.9
Tourville	5.3	16.3	89.3	31.1
Tregaron	-	-	-	4.4
Veridian	-	-	-	26.7
Warrego	-	-	33.4	21.1

TABLE 11.3

LEADS - SORTED BY RISKED SALES GAS (PJ)

MIDDLE *M.DIVERSUS*

	Risked Sales Gas (PJ)
Clarke	532.9
Tourville	89.3
Hilliard-Pelican 1, 5	73.3
EddyStone	63.9
Perkins-Cape Barren	63.3
Actaeon	51.3
Perkins	39.2
Warrego	33.4
Cape Barren	21.4
Rochon South	19.9
Hilliard East	15.6
Hilliard West	15.0
Surville	14.9
Grindstone	12.8
Poonboon North	11.4
Narimba West	9.9
Hunter	6.8
Rochon	6.2
Peron	4.9
Adamson	4.1
Lead G	2.2

TABLE 11.4

LEADS - SORTED BY RISKED SALES GAS (PJ)

PALAEOCENE

	Risked Sales Gas (PJ)
Clarke	262.1
Eddystone	33.4
Tourville	31.1
Veridian	26.7
Actaeon-Tourville	26.4
Hilliard	22.8
Warrego	21.1
Rochon South	14.4
Actaeon	12.5
Grindstone	11.0
Rochon	9.6
Surville	7.0
Adamson	6.1
Hunter	6.1
Raoul West	6.1
Peron West	5.0
Raoul East	5.0
Tregaron	4.4
Lead G	2.5
Tomahawk	0.9
Peron East	0.7

TABLE 11.5

UNRISKED RECOVERABLE OIL (MMSTB) TO LOWEST CLOSING CONTOUR

LEAD	UPPER EVCM	UPPER *M.DIVERSUS*	MIDDLE *M.DIVERSUS*	PALAEOCENE
Actaeon	-	-	177.3	68.0
Actaeon-Tourville	-	-	-	327.7
Adamson	-	-	27.9	33.9
Cape Barren	-	76.0	42.0	-
Clarke	-	-	973.6	468.1
Eddystone	-	-	100.7	127.1
Grindstone	-	-	26.8	35.2
Hilliard East	-	-	23.9	-
Hilliard West	-	-	22.3	-
Hilliard-Pelican 1, 5	-	-	112.7	-
Hilliard	-	-	-	56.2
Hunter	63.0	67.0	41.2	40.9
Lead G	-	-	19.7	15.0
Narimba West	-	36.8	19.9	-
Perkins	-	-	78.2	-
Perkins-Cape Barren	-	-	158.0	-
Peron	-	-	23.4	-
Peron East	-	-	-	4.8
Peron West	-	-	-	23.5
Poonboon North	-	-	53.4	-
Raoul East	-	-	-	15.1
Raoul West	-	-	-	18.8
Rochon	-	-	24.9	45.1
Rochon South	-	-	51.2	65.8
Surville	-	-	34.8	29.4
Tomahawk	-	-	-	9.3
Tourville	14.0	127.4	181.4	94.1
Tregaron	-	-	-	30.9
Veridian	-	-	-	124.7
Warrego	-	-	173.7	74.6

TABLE 11.6

RISKED RECOVERABLE OIL (MMSTB) TO LOWEST CLOSING CONTOUR

LEAD	UPPER EVCM	UPPER *M.DIVERSUS*	MIDDLE *M.DIVERSUS*	PALAEOCENE
Actaeon	-	-	10.6	2.5
Actaeon-Tourville	-	-	-	5.2
Adamson	-	-	0.7	0.8
Cape Barren	-	0.6	3.2	-
Clarke	-	-	84.1	234.0
Eddystone	-	-	6.8	3.4
Grindstone	-	-	1.5	0.8
Hilliard East	-	-	0.8	-
Hilliard West	-	-	0.8	-
Hilliard-Pelican 1, 5	-	-	3.8	-
Hilliard	-	-	-	1.0
Hunter	14.1	6.4	1.6	0.7
Lead G	-	-	0.5	0.3
Narimba West	-	1.1	1.5	-
Perkins	-	-	5.9	-
Perkins-Cape Barren	-	-	-	9.5
Peron	-	-	0.7	-
Peron East	-	-	-	0.1
Peron West	-	-	-	0.6
Poonboon North	-	-	3.9	-
Raoul East	-	-	-	0.7
Raoul West	-	-	-	0.9
Rochon	-	-	0.9	1.2
Rochon South	-	-	3.1	2.0
Surville	-	-	2.2	0.9
Tomahawk	-	-	-	0.1
Tourville	1.4	3.7	13.6	4.2
Tregaron	-	-	-	0.7
Veridian	-	-	-	5.2
Warrego	-	-	6.3	3.7

TABLE 11.7

LEADS - SORTED BY RISKED RECOVERABLE OIL (MMSTB)

PALAEOCENE

	Risked Recoverable Oil (MMSTB)
Clarke	234.0
Perkins-Cape Barren	9.5
Actaeon-Tourville	5.2
Veridian	5.2
Tourville	4.2
Warrego	3.7
Eddystone	3.4
Actaeon	2.5
Rochon South	2.0
Rochon	1.2
Hilliard	1.0
Raoul	0.9
Surville	0.9
Adamson	0.8
Grindstone	0.8
Hunter	0.7
Raoul East	0.7
Tregaron	0.7
Peron West	0.6
Lead G	0.3
Peron East	0.1
Tomahawk	0.1

TABLE 11.8

LEADS - SORTED BY RISKED RECOVERABLE OIL (MMSTB)

MIDDLE *M.DIVERSUS*

	Risked Recoverable Oil (MMSTB)
Clarke	84.1
Tourville	13.6
Actaeon	10.6
Eddystone	6.8
Warrego	6.3
Perkins	5.9
Poonboon North	3.9
Hilliard-Perkins 1, 5	3.8
Cape Barren	3.2
Rochon South	3.1
Surville	2.2
Hunter	1.6
Narimba West	1.5
Grindstone	1.5
Rochon	0.9
Hilliard East	0.8
Hilliard West	0.8
Adamson	0.7
Peron	0.7

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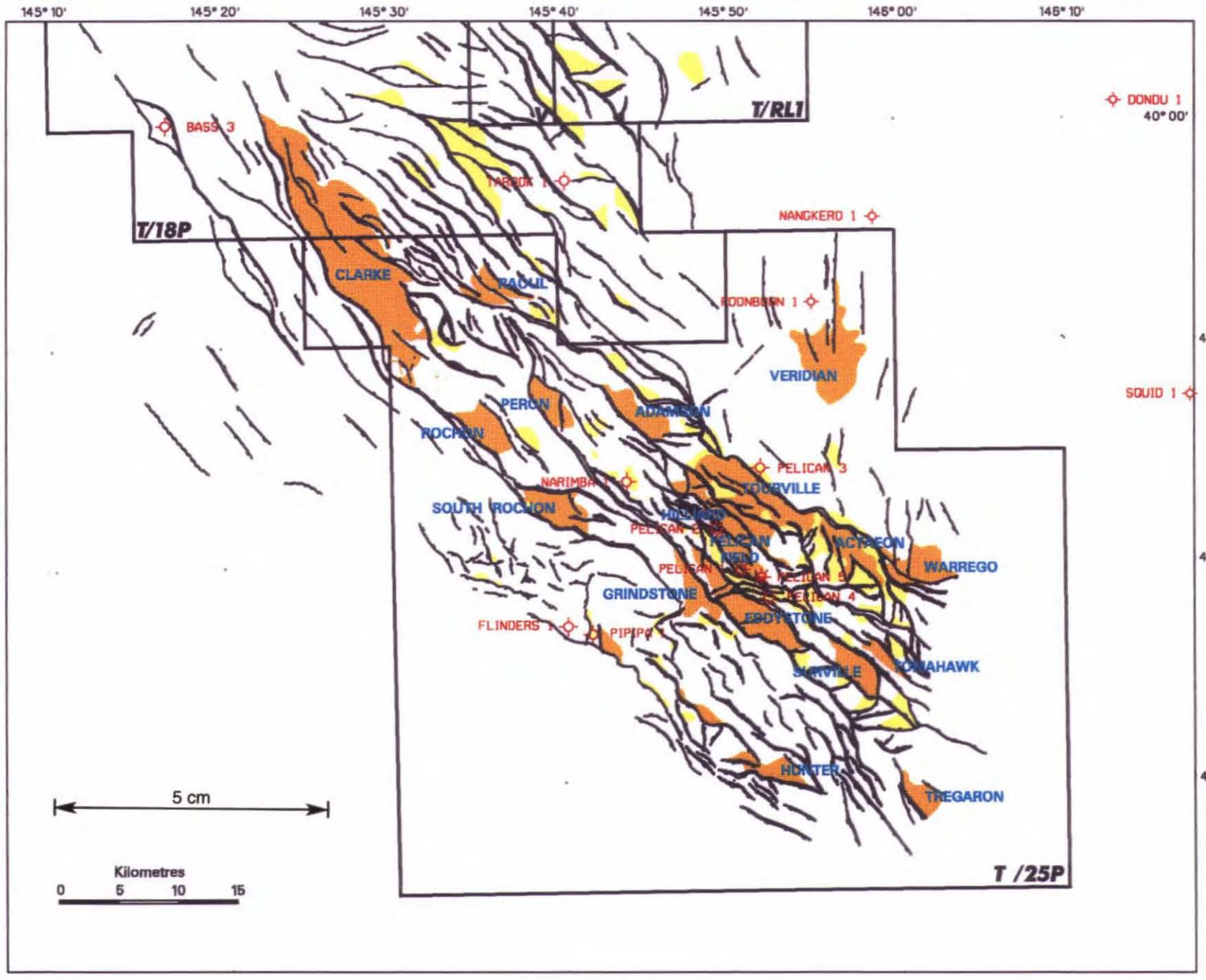

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T /25P
TOP PALAEOCENE
LEADS AND PROSPECTS

No: 10811.0794 FIG. 11.1

491179

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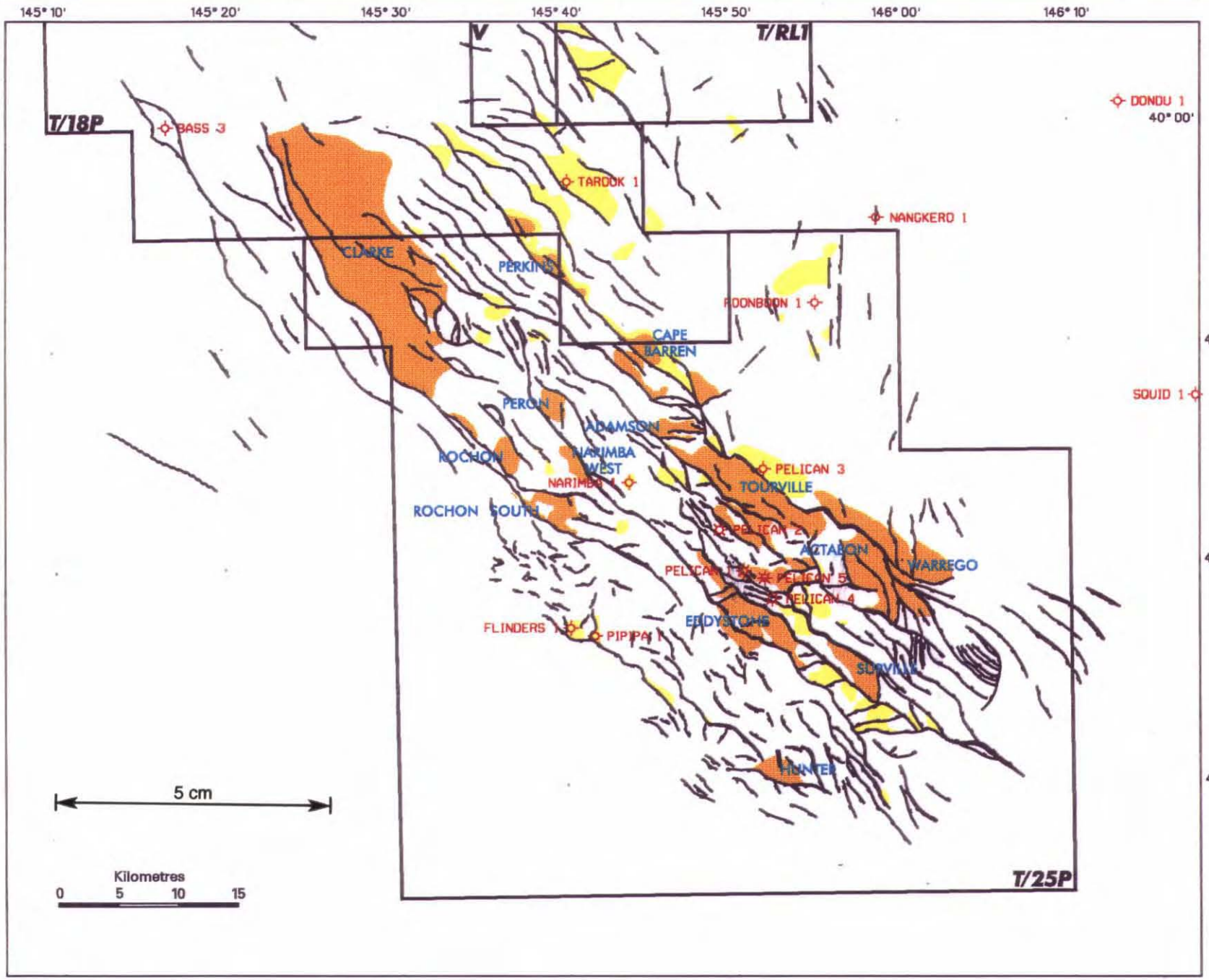
T /25P
TOP MID *M.DIVERSUS*
LEADS AND PROSPECTS



No: 10812.0794 FIG. 11.2

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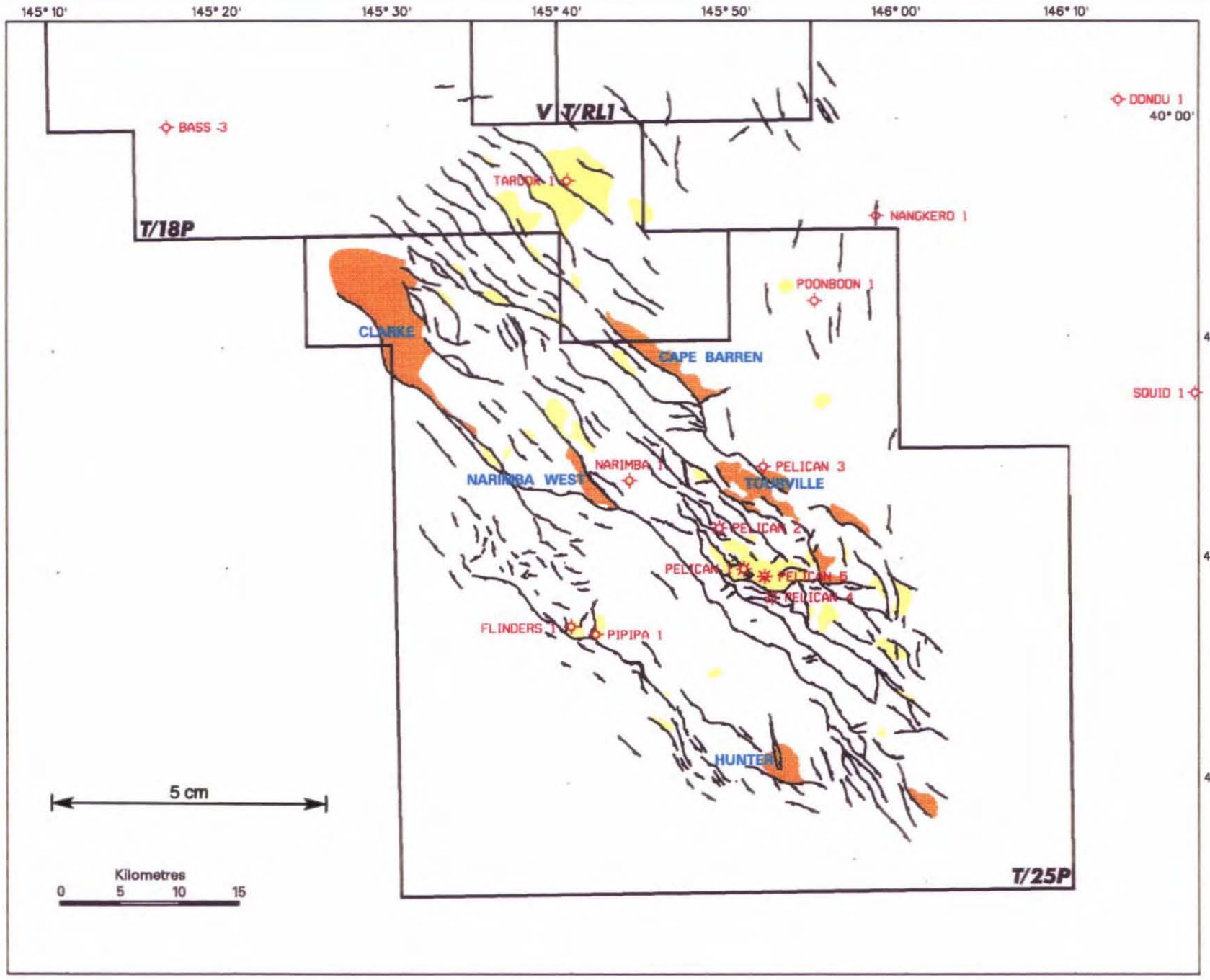
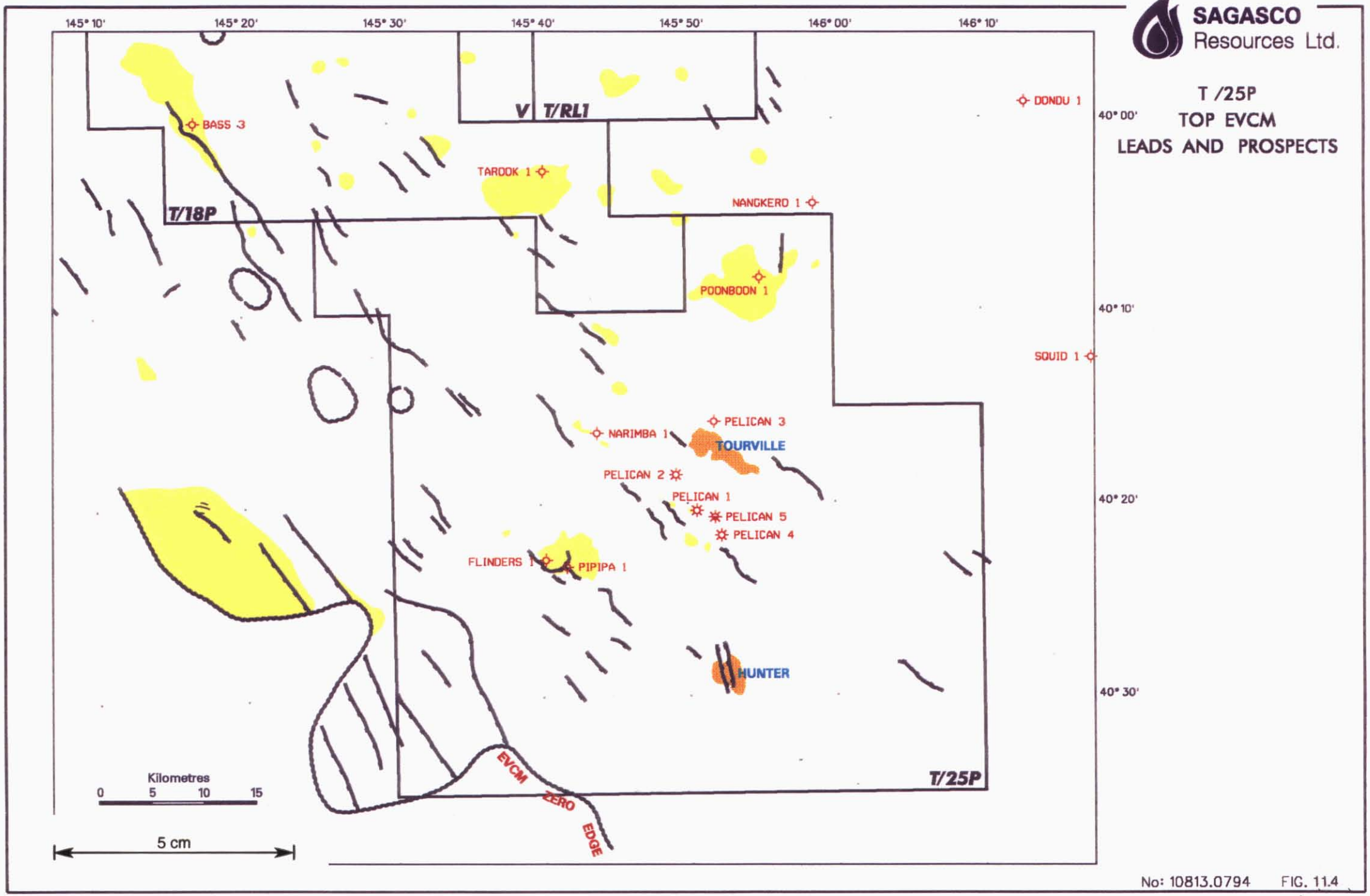
SAGASCO Resources Ltd.

T /25P
TOP UPPER *M.DIVERSUS*
LEADS AND PROSPECTS



No: 10810.0794 FIG. 11.3

491181



No: 10813.0794 FIG. 11.4

Only two leads have targets at the upper EVCM. The largest of these is Hunter which is a high risk oil play due largely to its late structural development.

Four leads are identified with upper *M.diversus* closures, but all have high risk due to the low chance of forming intraformational top seals within this unit. Either oil or gas accumulations would be possible at this level.

The most prospective targets occur in the middle *M.diversus* and Palaeocene levels where 22 and 20 closures respectively are identified. At the middle *M.diversus* level the Clarke lead has by far the largest potential on both an unrisked and risked basis. Other important individual leads at this level are Tourville, Eddystone, Actaeon, Perkins and Warrego. Combined closures around the Hilliard - Pelican 1 and 5 closures and the combined Perkins - Cape Barren feature also are ranked highly. A more detailed study of the implications of the current mapping for the Pelican Field is beyond the scope of this study but is recommended for future work. Condensate rich-gas is the most likely trapped hydrocarbon in these plays, although the majority are shallow enough to preserve oil if it has not been displaced by later gas charge.

At the Palaeocene level Clarke also has the largest potential on both an unrisked and risked basis. Other important Palaeocene leads are Eddystone, Tourville, Veridian, Hilliard and Warrego. A combined Actaeon-Tourville lead also rates highly. The most likely trapped hydrocarbon in most of these leads is condensate rich-gas. Some of the shallower leads could preserve an early oil charge if it has not been subsequently displaced by gas.

PROSPECT DATA SHEET

ACTAEON

CATEGORY	Lead		
LOCATION	Seismic line TNK4-97 Sp 320 (middle *M.diversus*) Seismic line TNK4-89 Sp 260 (Palaeocene)		
DESCRIPTION OF TRAP	Tilted fault block against complex northwesterly and easterly trending fault system.		
PRIMARY OBJECTIVES	EVCM - Middle *M.diversus* - Palaeocene		
MAXIMUM CLOSURE	EVCM - Middle *M.diversus* - Palaeocene	24.0 square kilometres 11.8 square kilometres (55.8 square kilometres with Tourville)	
SECONDARY OBJECTIVES	None		
DEPTH TO TOP RESERVOIR	EVCM - Middle *M.diversus* 2430 mSS - Palaeocene 2886 mSS		

DESCRIPTION OF RISK ELEMENTS

SOURCE

Actaeon overlies the proven gas-condensate source kitchen of the Pelican Trough. At the location the middle *M.diversus* is predicted to be early mature to mid mature for oil generation, whilst the Palaeocene is mid mature for oil generation through to late mature for gas at basement.

Migration of hydrocarbons into Actaeon is most likely from vertical migration from mature source rocks up fault conduits or from short distance migration from mature source material downdip, particularly from areas along strike to the northwest and southeast of the prospect. Actaeon also provides an opportunity to test the possibility of face loading by Early to Late Cretaceous source rocks underlying the extension of the Pelican 3 high directly into reservoir units of the Palaeocene and middle *M.diversus*. The source risk at Actaeon for gas is considered to be low and for oil moderate.

RESERVOIR

Porosity verses depth profiles predict that the average porosity at Actaeon will be 23% in the middle *M.diversus* and 18% in the Palaeocene. Actaeon is approximately 100 metres up dip of Pelican Field and therefore on this basis a slight improvement in permeability might be expected. However as Actaeon is located adjacent to the Pelican 3 basement high it is possible that reservoirs representing so far untested sequences such as alluvial fans shedding from the basement high or a localisation of fluvial channel facies may be present. The reservoir risk for Actaeon is considered to be very low for the middle *M.diversus*, and moderate to high for the Palaeocene.

SEAL

Closure at Actaeon relies on intraformational seals in the EVCM which have low risk and lateral fault seals which have moderate risk in the middle *M.diversus* and low to moderate risk in the Palaeocene. Reactivation of the basement involved Warrego Fault may have caused leakage although this is not considered a major risk as significant generation post dates fault movement. Juxtaposition of potential reservoir units with a probably predominantly shaly Late Cretaceous sequence is likely to be the main lateral sealing mechanism.

STRUCTURE

Faulting in the Actaeon area is fairly complex and therefore as closure is fault dependent, there is high structural risk. The trapping geometry at Actaeon was established at the end of the middle *M.diversus*. A possible greater closure incorporating Actaeon and Tourville is observed at the Palaeocene level which is ranked as very high risk.

ADDITIONAL WORK REQUIRED

New seismic data was acquired as part of the Rocky Cape Seismic Survey during 1994. Remapping incorporating the new data will be performed when processing is completed.

ACTAEON.XLS

ACTAEON - T/25P

EVCM Middle M diversus zone

RESERVES CALCULATION (Simple Slab Model)

	Depth (m)	Vertical Closure (m)	Area (sq km)	Bulk Rock Volume (cubic m)	Cum. OGIP (BCF)	Cum. Raw Gas (BCF)	Cum. Sales Gas (BCF)	Cum. Sales Gas (PJ)	Cum. Condensate (MMSTB)	Cum. OOIP (MMSTB)	Cum. REC. OIL (MMSTB)
1890	2430	10	1.27	3.81E+07	49.20	41.82	29.28	32.34	4.18	37.58	9.39
1900	2447	27	6.23	1.87E+08	241.17	205.00	143.50	158.54	20.50	184.19	46.05
1910	2464	44	10.44	3.13E+08	404.59	343.90	240.73	265.96	34.39	308.99	77.25
1920	2484.9	64.9	14.31	4.29E+08	554.29	471.14	329.80	364.37	47.11	423.32	105.83
1930	2505.8	85.8	18.63	5.59E+08	721.81	613.54	429.48	474.49	61.35	551.26	137.81
1940	2524.5	104.5	23.97	7.19E+08	928.77	789.45	552.62	610.54	78.95	709.32	177.33

RISKED SALES GAS (PJ)	51.29
RISKED REC OIL (MMSTB)	10.64

Input Parameters	
Net Pay (m)	30
Porosity	0.23
Sh	0.75
Bg	212
Boi	1.10
Condensate (BBL's/MMSCF)	100
Recovery factor (gas)	0.85
Recovery factor (oil)	0.25
Sales factor (gas)	0.7

RISK	%
SOURCE GAS	70%
SOURCE OIL	50%
SEAL	50%
RESERVOIR	80%
STRUCTURE	30%
CHANCE OF SUCCESS GAS	8.40%
CHANCE OF SUCCESS OIL	6.00%

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ACTAEON.XLS

ACTAEON - T/25P

EVCM Palaeocene

RESERVES CALCULATION (Simple Slab Model)

	Depth (m)	Vertical Closure (m)	Area (sq km)	Bulk Rock Volume (cubic m)	Cum. OGIP (BCF)	Cum. Raw Gas (BCF)	Cum. Sales Gas (BCF)	Cum. Sales Gas (PJ)	Cum. Condensate (MMSTB)	Cum. OOIP (MMSTB)	Cum. REC. OIL (MMSTB)
2130	2885.6	10	0.17	4.98E+06	5.34	4.54	3.18	3.51	0.45	3.84	0.96
2140	2902.3	26.7	0.82	2.46E+07	26.39	22.43	15.70	17.35	2.24	18.99	4.75
2150	2917.7	42.1	1.73	5.18E+07	55.61	47.27	33.09	36.55	4.73	40.01	10.00
2160	2933.8	58.2	3.14	9.43E+07	101.17	86.00	60.20	66.51	8.60	72.80	18.20
2170	2952.5	76.9	5.21	1.56E+08	167.59	142.45	99.72	110.17	14.25	120.60	30.15
2180	2971.3	95.7	8.42	2.53E+08	271.08	230.42	161.29	178.20	23.04	195.07	48.77
2190	2990	114.4	11.75	3.53E+08	378.20	321.47	225.03	248.62	32.15	272.15	68.04

RISKED SALES GAS (PJ)	12.53
RISKED REC OIL (MMSTB)	2.45

Input Parameters	
Net Pay (m)	30
Porosity	0.18
Sh	0.75
Bg	225
Boi	1.10
Condensate (BBL's/MMSCF)	100
Recovery factor (gas)	0.85
Recovery factor (oil)	0.25
Sales factor (gas)	0.7

RISK	%
SOURCE GAS	70%
SOURCE OIL	50%
SEAL	60%
RESERVOIR	40%
STRUCTURE	30%
CHANCE OF SUCCESS GAS	5.04%
CHANCE OF SUCCESS OIL	3.60%

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ACTAEON.XLS

GREATER ACTAEON - TOURVILLE - T/25P

EVCM Palaeocene

RESERVES CALCULATION (Simple Slab Model)

	Depth (m)	Vertical Closure (m)	Area (sq km)	Bulk Rock Volume (cubic m)	Cum. OGIP (BCF)	Cum. Raw Gas (BCF)	Cum. Sales Gas (BCF)	Cum. Sales Gas (PJ)	Cum. Condensate (MMSTB)	Cum. OOIP (MMSTB)	Cum. REC. OIL (MMSTB)
2130	2885.6	10	0.17	4.98E+06	5.34	4.54	3.18	3.51	0.45	3.84	0.96
2140	2902.3	26.7	0.82	2.46E+07	26.39	22.43	15.70	17.35	2.24	18.99	4.75
2150	2917.7	42.1	1.73	5.18E+07	55.61	47.27	33.09	36.55	4.73	40.01	10.00
2160	2933.8	58.2	3.14	9.43E+07	101.17	86.00	60.20	66.51	8.60	72.80	18.20
2170	2952.5	76.9	5.21	1.56E+08	167.59	142.45	99.72	110.17	14.25	120.60	30.15
2180	2971.3	95.7	8.42	2.53E+08	271.08	230.42	161.29	178.20	23.04	195.07	48.77
2190	2990	114.4	11.75	3.53E+08	378.20	321.47	225.03	248.62	32.15	272.15	68.04
2200	3010	134.4	43.23	1.30E+09	1391.15	1182.47	827.73	914.49	118.25	1001.06	250.26
2210	3030	154.4	47.80	1.43E+09	1538.01	1307.31	915.12	1011.04	130.73	1106.74	276.69
2220	3048.2	172.6	51.37	1.54E+09	1652.99	1405.04	983.53	1086.62	140.50	1189.48	297.37
2230	3066.3	190.7	52.64	1.58E+09	1694.05	1439.94	1007.96	1113.61	143.99	1219.03	304.76
2240	3086.1	210.5	55.74	1.67E+09	1793.77	1524.71	1067.30	1179.16	152.47	1290.79	322.70

RISKED SALES GAS (PJ)	26.41
RISKED REC OIL (MMSTB)	5.16

Input Parameters	
Net Pay (m)	30
Porosity	0.18
Sh	0.75
Bg	225
Boi	1.10
Condensate (BBL's/MMSCF)	100
Recovery factor (gas)	0.85
Recovery factor (oil)	0.25
Sales factor (gas)	0.7

RISK	%
SOURCE GAS	70%
SOURCE OIL	50%
SEAL	40%
RESERVOIR	40%
STRUCTURE	20%
CHANCE OF SUCCESS GAS	2.24%
CHANCE OF SUCCESS OIL	1.60%

24/05/94

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T/25P – ACTAEON LEAD TOP PALAEOCENE

145° 55'

146° 00'

40° 15'

40° 20'

40° 25'

PELICAN 3

TOURVILLE

ACTAEON

WARREGO

PELICAN 5

PELICAN 4

EDDYSTONE

SURVILLE

TOMAHAWK

0 Km 6

5 cm

No: 10673.0794 FIG. 11.5

491189

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T /25P – ACTAEON LEAD TOP MID *M.DIVERSUS*

140° 55'

146° 00'

40° 15'

40° 20'

40° 25'

VACANT

T /25P

TOURVILLE

ACTAEON

WARREGO

EDDYSTONE

SURVILLE

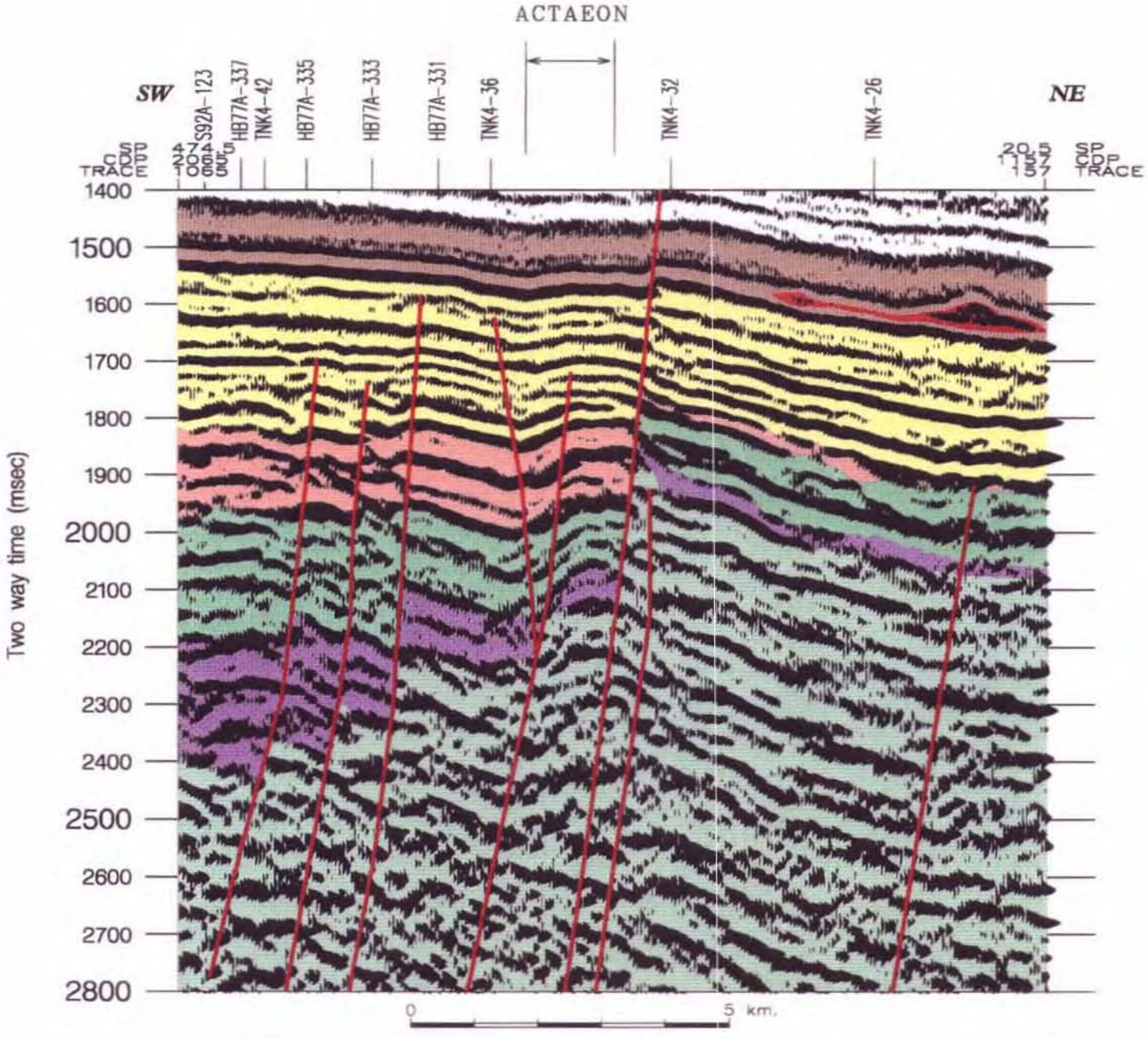
0 Km 6

5 cm

No: 10656.0794 FIG. 11.6

491190

SAGASCO Resources Ltd.



5 cm

— LEGEND —

- DEMON'S BLUFF FM
- UPPER EVCM
- UPPER M.DIVERSUS
- MIDDLE M.DIVERSUS
- LOWER M.DIVERSUS
- PALAEOCENE & CRETACEOUS
- BASEMENT
- VOLCANICS & INTRUSIVES

BASS BASIN - T/25P
ACTAEON

DIP LINE TNK4-89

No: 10778.0794 FIG. 11.7

PROSPECT DATA SHEET

ADAMSON

CATEGORY	Lead		
LOCATION	Seismic line TQH5-147 Sp 690 (middle *M.diversus*) Seismic line TQH5-147 Sp 690 (Palaeocene)		
DESCRIPTION OF TRAP	Tilted fault block controlled by northwest trending fault		
PRIMARY OBJECTIVES	EVCM -	Middle *M.diversus* Palaeocene	
MAXIMUM CLOSURE	EVCM -	Middle *M.diversus* Palaeocene	5.5 square kilometres 10.7 square kilometres
SECONDARY OBJECTIVES	None		
DEPTH TO TOP RESERVOIR	EVCM -	Middle *M.diversus* Palaeocene	2525 mSS 3212 mSS

DESCRIPTION OF RISK ELEMENTS

SOURCE

Adamson is adjacent to the proven gas-condensate charge of the Pelican Trough. At the location the middle *M.diversus* is mid-mature for oil generation passing through to middle to late mature for oil generation at the top Palaeocene and overmature for all hydrocarbon generation at basement.

Adamson relies for hydrocarbon migration on either vertical migration up fault conduits or face loading from mature Late Cretaceous source material. Source risk for gas is low and moderate for oil.

RESERVOIR

Porosity verses depth profiles predict that the average porosity in the middle *M.diversus* will be 22% declining to 15% in the Palaeocene. Adamson is at approximately the same elevation as Pelican Field and therefore there is high risk of encountering low permeability reservoirs in the Palaeocene and a moderate to high risk in the middle *M.diversus*.

SEAL

All closure at Adamson is fault dependent and relies on the development of fault plane seals. Fault movement was active between the middle *M.diversus* and *P.asperopolus* times. Sealing risk is considered to be moderate to high in the middle *M.diversus* and because of increased shale in the Palaeocene the risk of seal failure there is rated as moderate.

491192

STRUCTURE

Adamson is poorly controlled by seismic with no strike control at the middle *M.diversus* and Palaeocene levels, and further data is required to mature the lead. Trapping geometry at Adamson was established by the end of middle *M.diversus* time. Structural risk is rated as high.

ADDITIONAL WORK REQUIRED

Adamson requires additional seismic data to detail the lead in the dip direction and to provide control in the strike orientation. No additional data was recorded at Adamson during the Rocky Cape Seismic Survey.

491193

ADAMSON.XLS

ADAMSON - T/25P

EVCM Middle M diversus zone

RESERVES CALCULATION (Simple Slab Model)

Contour (twt)	Depth (m)	Vertical Closure (m)	Area (sq km)	Bulk Rock Volume (cubic m)	Cum. OGIP (BCF)	Cum. Raw Gas (BCF)	Cum. Sales Gas (BCF)	Cum. Sales Gas (PJ)	Cum. Condensate (MMSTB)	Cum. OOIP (MMSTB)	Cum. REC. OIL (MMSTB)
1940	2524.5	10	0.86	2.59E+07	32.40	27.54	19.28	21.30	2.75	17.52	4.38
1950	2542.7	28.2	5.49	1.65E+08	206.21	175.28	122.70	135.56	17.53	111.54	27.89

RISKED SALES GAS (PJ)	4.12
RISKED REC OIL (MMSTB)	0.67

Input Parameters	
Net Pay (m)	30
Porosity	0.22
Sh	0.75
Bg	215
Boi	1.53
Condensate (BBL's/MMSCF)	100
Recovery factor (gas)	0.85
Recovery factor (oil)	0.25
Sales factor (gas)	0.7

RISK	%
SOURCE GAS	70%
SOURCE OIL	50%
SEAL	40%
RESERVOIR	40%
STRUCTURE	30%
CHANCE OF SUCCESS GAS	3.36%
CHANCE OF SUCCESS OIL	2.40%

24/05/94

491194

ADAMSON.XLS

ADAMSON - T/25P

EVCM Palaeocene

RESERVES CALCULATION (Simple Slab Model)

Contour (twt)	Depth (m)	Vertical Closure (m)	Area (sq km)	Bulk Rock Volume (cubic m)	Cum. OGIP (BCF)	Cum. Raw Gas (BCF)	Cum. Sales Gas (BCF)	Cum. Sales Gas (PJ)	Cum. Condensate (MMSTB)	Cum. OOIP (MMSTB)	Cum. REC. OIL (MMSTB)
2310	3212.5	10	0.69	2.06E+07	18.89	16.05	11.24	12.42	1.61	8.69	2.17
2320	3231.3	28.8	2.41	7.23E+07	66.35	56.40	39.48	43.62	5.64	30.52	7.63
2330	3250	47.5	4.77	1.43E+08	131.21	111.53	78.07	86.26	11.15	60.35	15.09
2340	3268.2	65.7	7.50	2.25E+08	206.51	175.53	122.87	135.75	17.55	94.98	23.75
2350	3286.3	83.8	10.70	3.21E+08	294.50	250.33	175.23	193.60	25.03	135.45	33.86

RISKED SALES GAS (PJ)	6.10
RISKED REC OIL (MMSTB)	0.76

Input Parameters	
Net Pay (m)	30
Porosity	0.15
Sh	0.75
Bg	231
Boi	1.68
Condensate (BBL's/MMSCF)	100
Recovery factor (gas)	0.85
Recovery factor (oil)	0.25
Sales factor (gas)	0.7

RISK	%
SOURCE GAS	70%
SOURCE OIL	50%
SEAL	50%
RESERVOIR	30%
STRUCTURE	30%
CHANCE OF SUCCESS GAS	3.15%
CHANCE OF SUCCESS OIL	2.25%

24/05/94

491195

SAGASCO Resources Ltd.

T/25P – ADAMSON LEAD TOP PALAEOCENE

145° 40'

145° 45'

40° 10'

40° 15'

ADAMSON

TOURVILLE

HILLIARD

PELICAN FIELD

5 cm

0 Km 6

No: 10674.0794 FIG. 11.8

491196

SAGASCO Resources Ltd.

T /25P – ADAMSON LEAD TOP MID *M.DIVERSUS*

PERKINS

CAPE BARREN

T /18P

T /25P

ADAMSON

NARIMBA WEST

NARIMBA 1

ROCHON SOUTH

TOURVILLE

PELICAN 3

PELICAN 2

PELICAN 1

PELICAN 5

EDDYSTONE

145° 45'

40° 10'

40° 15'

40° 20'

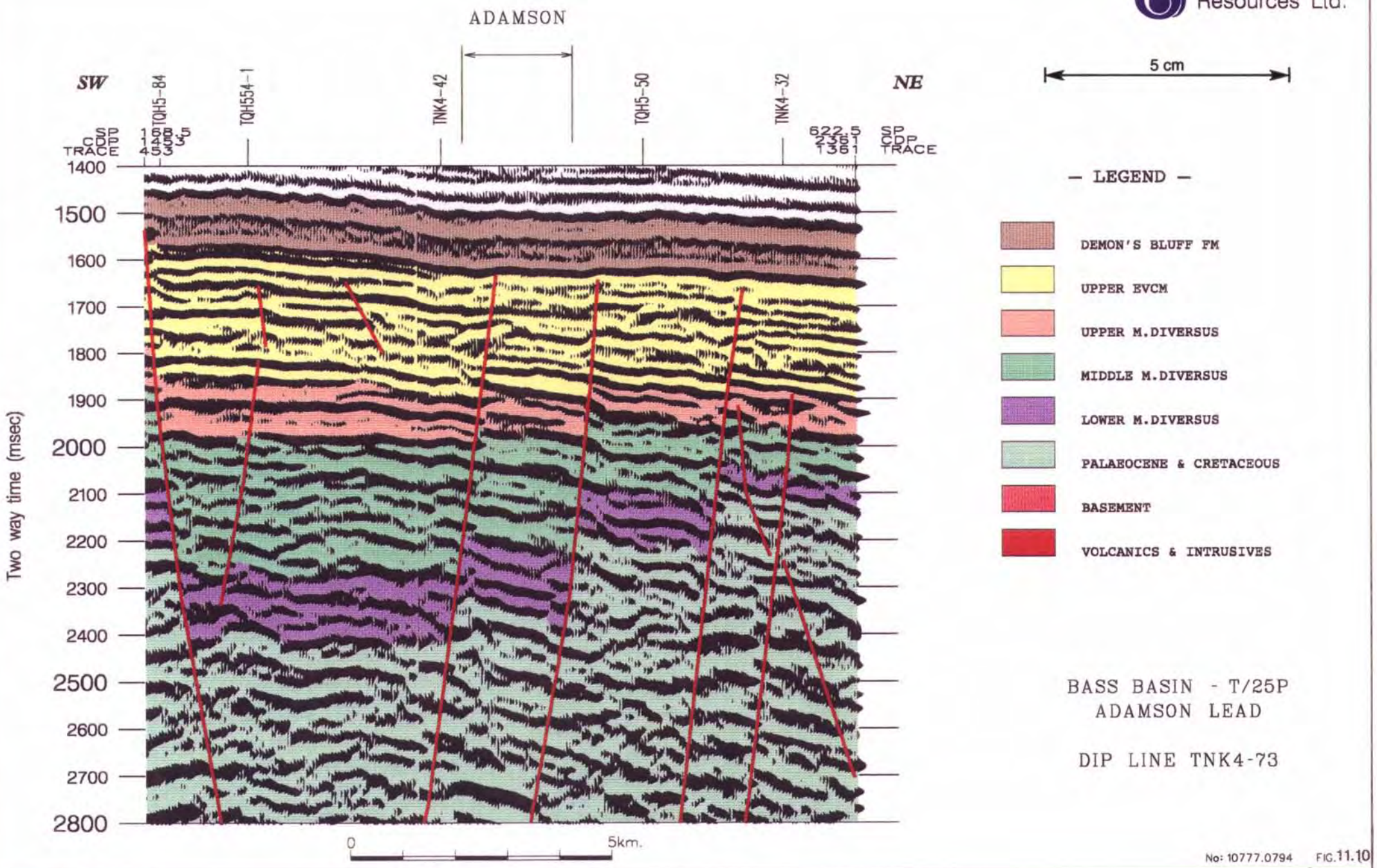
5 cm

0 Km 6

No: 10657.0794 FIG. 11.9

491197

SAGASCO Resources Ltd.



BASS BASIN - T/25P
ADAMSON LEAD

DIP LINE TNK4-73

No: 10777.0794 FIG. 11.10

PROSPECT DATA SHEET

CAPE BARREN

CATEGORY	Weak Lead		
LOCATION	Seismic line TNK4-71 Sp 550 (middle *M.diversus*) Lead extends approximately one quarter into T/18P		
DESCRIPTION OF TRAP	Low relief tilted fault block on upthrown side of northwest trending fault		
PRIMARY OBJECTIVES	EVCM - Middle *M.diversus*		
MAXIMUM CLOSURE	EVCM - Middle *M.diversus* Upper *M.diversus*		28.7 square kilometres 13.4 square kilometres
SECONDARY OBJECTIVES	EVCM - Upper *M.diversus*		
DEPTH TO TOP RESERVOIR	EVCM - Middle *M.diversus*		2505 mSS

DESCRIPTION OF RISK ELEMENTS

SOURCE

Cape Barren is located on the western edge of the Poonboon Platform near the north eastern margin of the Pelican Trough a proven gas and condensate source kitchen. At the location the middle *M.diversus* is early to mid-mature for oil generation passing through to middle mature for oil generation at the top Palaeocene and is nearly overmature for all hydrocarbon generation at basement. Source risk is for gas is considered low to moderate, whilst oil risk is considered moderate to high.

Migration is possible from either vertical migration from mature Palaeocene and Late Cretaceous source material or from cross fault face loading by Late Cretaceous source beds with Palaeocene reservoirs and Palaeocene source beds with middle *M.diversus* reservoirs.

RESERVOIR

Regional porosity verses depth profiles predict that in the middle *M.diversus* the average porosity will be 22% and in the secondary objective upper *M.diversus* it will be 24%. However improved reservoir development in Poonboon 1 and Nangkero 1 suggest the Poonboon Platform reservoirs, including those at Adamson, may have better porosity and permeability development than exist in the adjacent Pelican Trough. Reservoir risk at Cape Barren is considered to be low for the upper *M.diversus* and low to moderate for the middle *M.diversus*.

SEAL

All closure at Cape Barren is fault dependent and relies on the development of fault plane seals. Sealing risk is therefore rated as high. Sealing risk is very high for the upper *M.diversus* and moderate for the middle *M.diversus*.

STRUCTURE

Structural closure at the upper *M.diversus* level is high risk due to dependence on a poorly controlled northeast trending anti-regional fault. Fault movement on the faults bounding Cape Barren occurred until the top of the EVCM, with minor flexural movement into the Demons Bluff Formation. The trapping configuration at Cape Barren was established in the middle *M.diversus*. Structural risk is very high for the upper *M.diversus* and moderate for the middle *M.diversus*.

ADDITIONAL WORK REQUIRED

Closure in the strike orientation over Cape Barren is poor and additional data is required to confirm closure. Infill dip lines are also required to detail the lead. Cape Barren was not addressed in the recent Rocky Cape Seismic Survey.

491200

CAPEBARR.XLS

CAPE BARREN - T/25P

EVCM Upper M diversus zone

RESERVES CALCULATION (Simple Slab Model)

Contour (twt)	Depth (m)	Vertical Closure (m)	Area (sq km)	Bulk Rock Volume (cubic m)	Cum. OGIP (BCF)	Cum. Raw Gas (BCF)	Cum. Sales Gas (BCF)	Cum. Sales Gas (PJ)	Cum. Condensate (MMSTB)	Cum. OOIP (MMSTB)	Cum. REC. OIL (MMSTB)
1860	2380	10	1.41	4.22E+07	56.88	48.35	33.84	37.39	4.83	31.83	7.96
1870	2396.7	26.7	13.44	4.03E+08	543.50	461.97	323.38	357.28	46.20	304.18	76.04

RISKED SALES GAS (PJ)	5.00
RISKED REC OIL (MMSTB)	0.64

Input Parameters	
Net Pay (m)	30
Porosity	0.24
Sh	0.75
Bg	212
Boi	1.50
Condensate (BBL's/MMSCF)	100
Recovery factor (gas)	0.85
Recovery factor (oil)	0.25
Sales factor (gas)	0.7

RISK	%
SOURCE GAS	50%
SOURCE OIL	30%
SEAL	20%
RESERVOIR	70%
STRUCTURE	20%
CHANCE OF SUCCESS GAS	1.40%
CHANCE OF SUCCESS OIL	0.84%

24/05/94

491201

CAPEBARR.XLS

CAPE BARREN - T/25P

EVCM Middle M diversus zone

RESERVES CALCULATION (Simple Slab Model)

Contour (twt)	Depth (m)	Vertical Closure (m)	Area (sq km)	Bulk Rock Volume (cubic m)	Cum. OGIP (BCF)	Cum. Raw Gas (BCF)	Cum. Sales Gas (BCF)	Cum. Sales Gas (PJ)	Cum. Condensate (MMSTB)	Cum. OOIP (MMSTB)	Cum. REC. OIL (MMSTB)
1930	2505.8	10	2.35	7.05E+07	88.32	75.07	52.55	58.06	7.51	47.89	11.97
1940	2524.5	28.71	8.24	2.47E+08	309.83	263.35	184.35	203.67	26.34	168.02	42.00

RISKED SALES GAS (PJ)	21.39
RISKED REC OIL (MMSTB)	3.15

Input Parameters	
Net Pay (m)	30
Porosity	0.22
Sh	0.75
Bg	215
Boi	1.53
Condensate (BBL's/MMSCF)	100
Recovery factor (gas)	0.85
Recovery factor (oil)	0.25
Sales factor (gas)	0.7

RISK	%
SOURCE GAS	70%
SOURCE OIL	50%
SEAL	50%
RESERVOIR	60%
STRUCTURE	50%
CHANCE OF SUCCESS GAS	10.50%
CHANCE OF SUCCESS OIL	7.50%

24/05/94

491202

SAGASCO Resources Ltd.

T /25P – CAPE BARREN WEAK LEAD TOP MID *M.DIVERSUS*

145° 40'
145° 45'
40° 05'
40° 10'
40° 15'

PERKINS
CAPE BARREN
T/18P
T/25P
PERON
ADAMSON
NARIMBA WEST
NARIMBA 1
TOURVILLE
ROCHON SOUTH

5 cm

0 Km 6

No: 10658.0794 FIG. 11.11

491203

SAGASCO Resources Ltd.

T /25P – CAPE BARREN WEAK LEAD TOP UPPER *M.DIVERSUS*

145° 45'

T /18P
T /25P

40° 10'

40° 15'

CAPE BARREN

NARIMBA WEST

NARIMBA 1

TOURVILLE

PELICAN 3

PELICAN 2

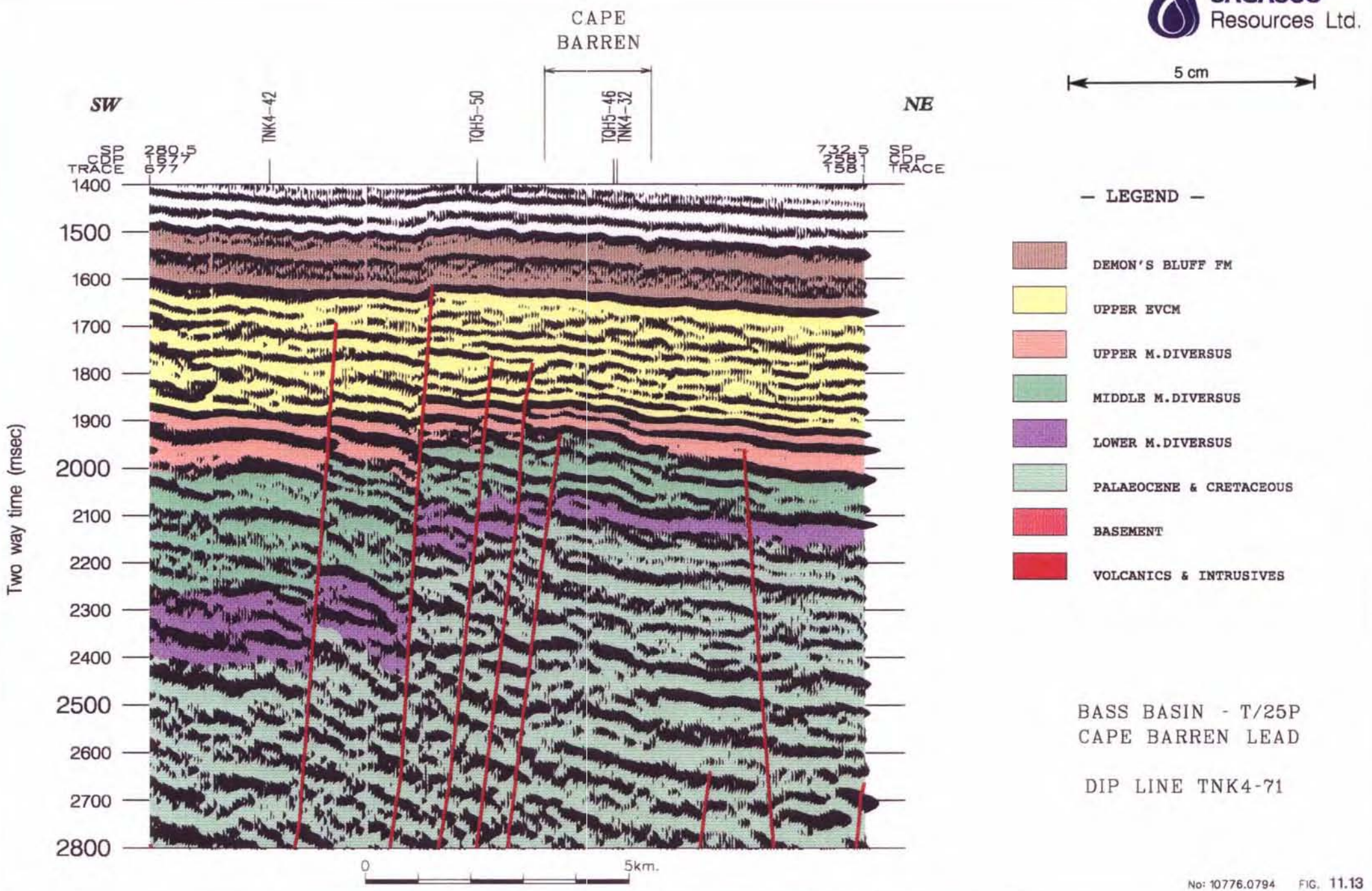
5 cm

0 Km 6

No: 10666.0794 FIG. 11.12

491204

SAGASCO Resources Ltd.



BASS BASIN - T/25P
CAPE BARREN LEAD

DIP LINE TNK4-71

No: 10776.0794 FIG. 11.13

PROSPECT DATA SHEET

CLARKE

CATEGORY	Strong Lead		
LOCATION	Seismic line TQH5-45-1 Sp 210 (middle *M.diversus*) Seismic line TQH5-43 Sp 330 (Palaeocene) Approximately half the mapped closure extends into T/18P		
DESCRIPTION OF TRAP	Very large tilted fault block on the downthrown side of a major northwest trending fault on the flanks of the Bass 3 high.		
PRIMARY OBJECTIVES	EVCM -	Middle *M.diversus* Palaeocene	
MAXIMUM CLOSURE	EVCM -	Middle *M.diversus*	181.6 square kilometres
		Palaeocene	92.1 square kilometres
SECONDARY OBJECTIVES	EVCM -	Upper *M.diversus*	
DEPTH TO TOP RESERVOIR	EVCM -	Middle *M.diversus*	2460 mSS
		Palaeocene	2525 mSS

DESCRIPTION OF RISK ELEMENTS

SOURCE

Structural closure is mapped extending into the mature source kitchen of the northwestern Pelican Trough. At Clarke the middle *M.diversus* is early mature grading to mid mature at the Palaeocene and gas mature to overmature at basement. Reservoir sequences developed at Clarke below the middle *M.diversus* will therefore have direct access to mature source for both oil and gas.

Clarke relies on simple short distance migration routes from very large drainage areas and both source and migration are considered to be low risk for gas and moderate to, moderate to low for oil.

RESERVOIR

Regional porosity verses depth profiles predict that the middle *M.diversus* will have an average porosity of 23% and the Palaeocene will have an average porosity of 22%. The high preserved porosities in the Palaeocene are due to its shallow depth of burial. Absence of the upper *M.diversus* at this location indicates that this are has been uplifted either in middle *M.diversus* time to prevent deposition of this unit or after upper *M.diversus* time to provide subcrop. In any case this enhances its likelihood of being also located on a migration pathway. There is no nearby well control in a similar structural setting to Clarke, therefore the predictions about reservoir quality could be inaccurate. The nearest well Bass 3 is located on a large basement high and only a thin Palaeocene section was intersected but with well developed sandstone units as seen in core 10. Thickening of these sandstones towards Clarke could provide excellent reservoir development at this lead. Reservoir risk is low to moderate.

SEAL

Vertical sealing is considered low risk and is dependent on intraformational seals. Lateral fault sealing of Palaeocene reservoirs is required by cross fault juxtaposition with Cretaceous rocks. Thinning of the middle *M.diversus* over Clarke could provide the development of a condensed shaly top seal to reservoir development in the Palaeocene. Sealing risk is rated as low to moderate.

STRUCTURE

The main structural risk is the continuity of the major bounding fault. Any fragmentation of this fault would lead to potential for updip leakage along fault relay zones. Additional seismic data recorded as part of the Rocky Cape Seismic Survey is designed to address the continuity of the bounding fault.

The trapping geometry at Clarke was established at the top of the middle *M.diversus* and therefore the lead has a long period in which to receive hydrocarbon charge from source areas.

Structural risk is rated as moderate to high.

ADDITIONAL WORK REQUIRED

Additional seismic data was acquired as part of the 1994 Rocky Cape Seismic Survey. Clarke will be remapped with the new data when processing is completed.

491207

CLARKE.XLS

CLARKE - T/25P

EVCM Middle M diversus zone

RESERVES CALCULATION (Simple Slab Model)

	Depth (m)	Vertical Closure (m)	Area (sq km)	Bulk Rock Volume (cubic m)	Cum. OGIP (BCF)	Cum. Raw Gas (BCF)	Cum. Sales Gas (BCF)	Cum. Sales Gas (PJ)	Cum. Condensate (MMSTB)	Cum. OOIP (MMSTB)	Cum. REC. OIL (MMSTB)
1790	2460	10	3.46	1.04E+08	134.01	113.91	79.74	88.09	11.39	74.17	18.54
1800	2480	30	14.82	4.45E+08	574.28	488.14	341.70	377.51	48.81	317.84	79.46
1810	2500	50	32.31	9.69E+08	1251.92	1064.13	744.89	822.97	106.41	692.88	173.22
1820	2520	70	53.79	1.61E+09	2083.95	1771.36	1239.95	1369.92	177.14	1153.38	288.34
1830	2540	90	69.54	2.09E+09	2694.22	2290.09	1603.06	1771.09	229.01	1491.14	372.78
1840	2560	110	92.25	2.77E+09	3573.83	3037.75	2126.43	2349.31	303.78	1977.96	494.49
1850	2580	130	110.76	3.32E+09	4291.26	3647.57	2553.30	2820.92	364.76	2375.03	593.76
1860	2600	150	136.06	4.08E+09	5271.40	4480.69	3136.48	3465.24	448.07	2917.50	729.37
1870	2620	170	154.50	4.63E+09	5985.58	5087.74	3561.42	3934.71	508.77	3312.76	828.19
1880	2640	190	181.63	5.45E+09	7036.73	5981.22	4186.86	4625.71	598.12	3894.53	973.63

RISKED SALES GAS (PJ)	532.88
RISKED REC OIL (MMSTB)	84.12

Input Parameters	
Net Pay (m)	30
Porosity	0.23
Sh	0.75
Bg	212
Boi	1.52
Condensate (BBL's/MMSCF)	100
Recovery factor (gas)	0.85
Recovery factor (oil)	0.25
Sales factor (gas)	0.7

RISK	%
SOURCE GAS	80%
SOURCE OIL	60%
SEAL	60%
RESERVOIR	60%
STRUCTURE	40%
CHANCE OF SUCCESS GAS	11.52%
CHANCE OF SUCCESS OIL	8.64%

491208

CLARKE.XLS

CLARKE - T/25P

EVCM Palaeocene

RESERVES CALCULATION (Simple Slab Model)

	Depth (m)	Vertical Closure (m)	Area (sq km)	Bulk Rock Volume (cubic m)	Cum. OGIP (BCF)	Cum. Raw Gas (BCF)	Cum. Sales Gas (BCF)	Cum. Sales Gas (PJ)	Cum. Condensate (MMSTB)	Cum. OOIP (MMSTB)	Cum. REC. OIL (MMSTB)
1940	2524.5	10	0.26	7.83E+06	9.81	8.34	5.84	6.45	0.83	5.31	1.33
1950	2542.7	28.2	7.74	2.32E+08	291.00	247.35	173.14	191.29	24.73	157.40	39.35
1960	2560	45.5	13.99	4.20E+08	525.66	446.81	312.77	345.55	44.68	284.33	71.08
1970	2576.6	62.1	22.71	6.81E+08	853.61	725.57	507.90	561.13	72.56	461.71	115.43
1980	2594	79.5	35.44	1.06E+09	1332.07	1132.26	792.58	875.65	113.23	720.51	180.13
1990	2614	99.5	46.16	1.38E+09	1734.80	1474.58	1032.21	1140.40	147.46	938.35	234.59
2000	2634	119.5	69.71	2.09E+09	2619.97	2226.98	1558.89	1722.28	222.70	1417.13	354.28
2010	2654	139.5	92.10	2.76E+09	3461.48	2942.26	2059.58	2275.46	294.23	1872.30	468.08

RISKED SALES GAS (PJ)	262.13
RISKED REC OIL (MMSTB)	234.04

Input Parameters	
Net Pay (m)	30
Porosity	0.22
Sh	0.75
Bg	215
Boi	1.53
Condensate (BBL's/MMSCF)	100
Recovery factor (gas)	0.85
Recovery factor (oil)	0.25
Sales factor (gas)	0.7

RISK	%
SOURCE GAS	80%
SOURCE OIL	50%
SEAL	60%
RESERVOIR	60%
STRUCTURE	40%
CHANCE OF SUCESS GAS	11.52%
CHANCE OF SUCESS OIL	7.20%

491209

SAGASCO Resources Ltd.

T/25P – CLARKE STRONG LEAD TOP PALAEOCENE

145° 25'

145° 30'

40° 00'

40° 05'

40° 10'

T/18P

CLARKE

T/25P

0 Km 6

5 cm

No: 10675.0794 FIG. 11.14

491210

SAGASCO Resources Ltd.

T /25P – CLARKE STRONG LEAD TOP MID *M.DIVERSUS*

145° 25'

145° 30'

40° 00'

T /18P 40° 05'

T /25P

CLARKE

40° 10'

5 cm

0 Km 6

No: 10659.0794 FIG. 11.15

491211

SAGASCO Resources Ltd.

T /25P – CLARKE STRONG LEAD TOP UPPER *M.DIVERSUS*

145° 30'

40° 05'

40° 10'

40° 15'

UPPER M. DIVERSUS

PROBABLE SUBCROP EDGE OF

CLARKE

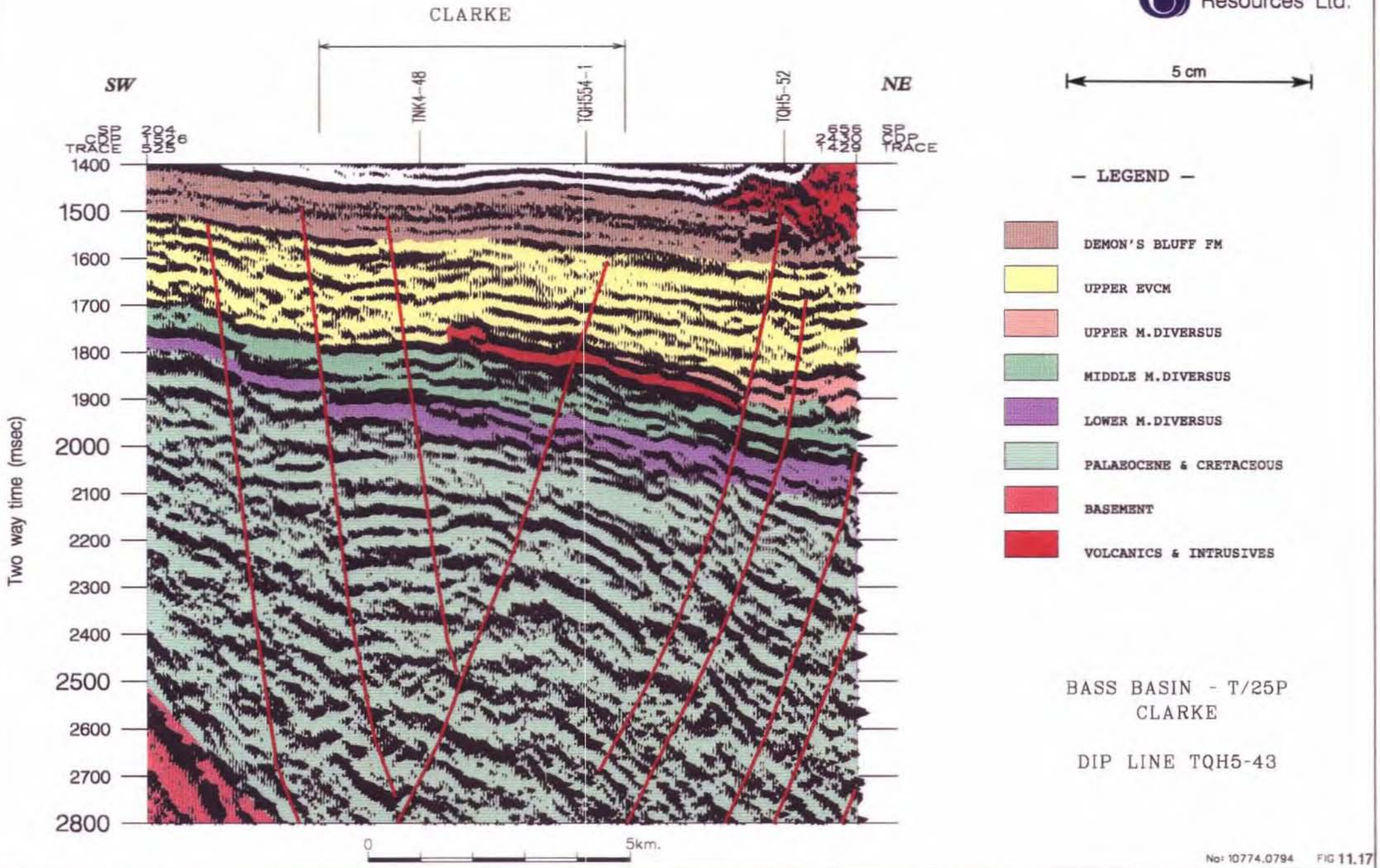
5 cm

0 Km 6

No: 10667.0794 FIG. 11.16

491212

SAGASCO Resources Ltd.



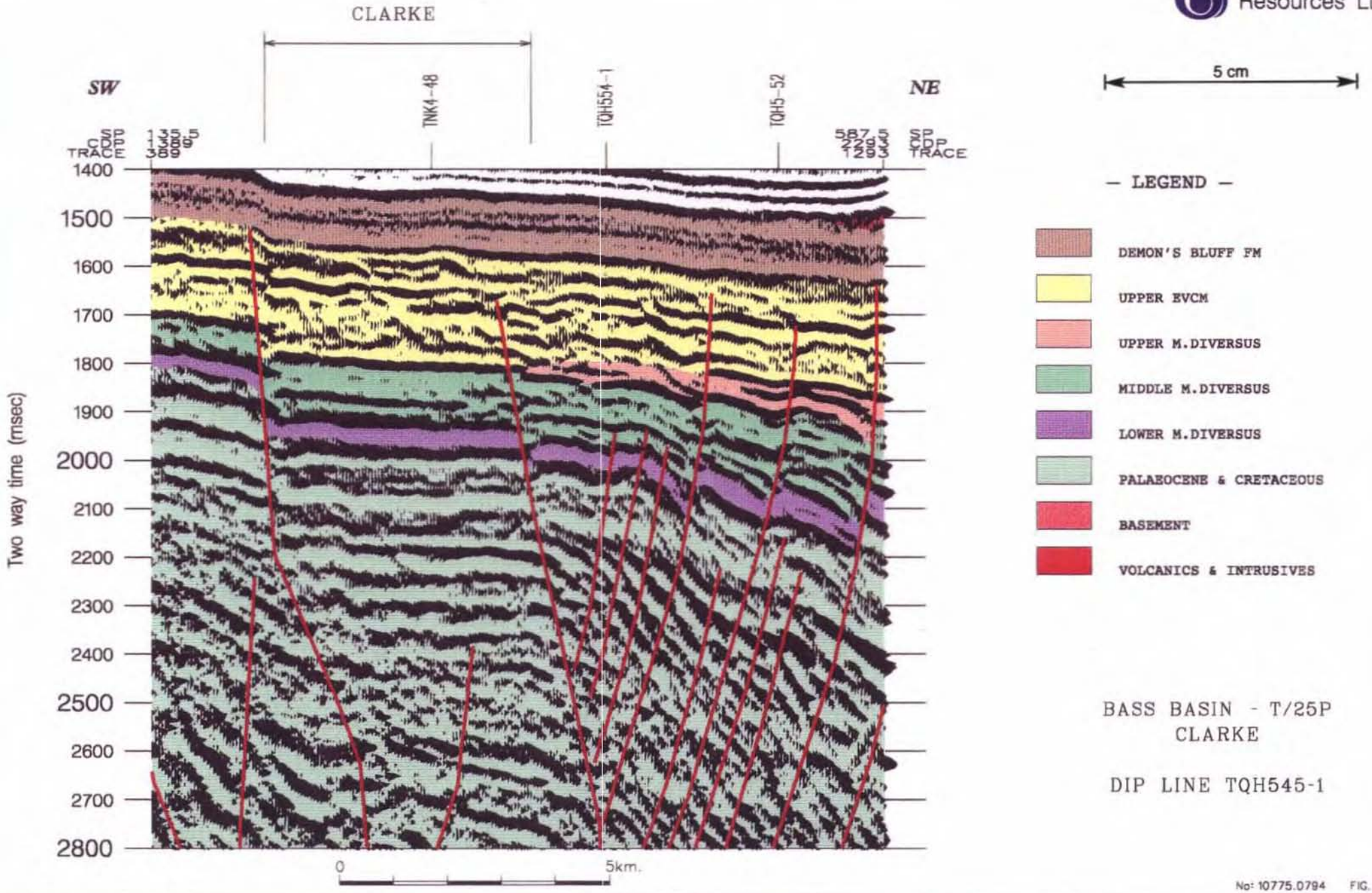
BASS BASIN - T/25P
CLARKE

DIP LINE TQH5-43

No: 10774.0794 FIG 11.17

491213

SAGASCO Resources Ltd.



BASS BASIN - T/25P
CLARKE

DIP LINE TQH545-1

No: 10775.0794 FIG. 11.18

491214

PROSPECT DATA SHEET

EDDYSTONE

(formerly LEAD Q)

CATEGORY	Strong Lead			
LOCATION	Seismic line S92A-119 Sp 720 (middle *M.diversus*) Seismic line S92A-119 Sp 740 (Palaeocene)			
DESCRIPTION OF TRAP	Large tilted fault block on the upthrown side of a northwest trending fault southwest of Pelican Field.			
PRIMARY OBJECTIVES	EVCM	-	Middle *M.diversus* Palaeocene	
MAXIMUM CLOSURE	EVCM	-	Middle *M.diversus* Palaeocene	18.7 square kilometres 22.0 square kilometres
SECONDARY OBJECTIVES	None			
DEPTH TO TOP RESERVOIR	EVCM	-	Middle *M.diversus* Palaeocene	2413 mSS 2886 mSS

DESCRIPTION OF RISK ELEMENTS

SOURCE

Eddystone is located directly above the mature source kitchen for the Pelican Field gas and condensate accumulation and therefore is ideally located to receive hydrocarbon charge. At Eddystone the middle *M.diversus* is early to mid mature for oil generation increasing to mid mature at the top Palaeocene and late gas generation at basement.

Cross relay ramp faulting may pose a barrier to migration into the prospect from the north and south. Vertical migration is therefore considered the most likely charge model for Eddystone although there is potential for sourcing the lead from source rocks in the middle *M.diversus* and Palaeocene to reservoir sequences in the lower and middle *M.diversus* by face loading. Similarly source sequences in the Cretaceous and deeper Palaeocene could face load into Palaeocene reservoirs.

The simpler structural form of Eddystone, compared with the fault compartmentalised Pelican Field may also assist in providing simpler migration routes. Source risk is rated as low for gas charge, moderate to high for oil at the middle *M.diversus* and high for oil at the Palaeocene.

RESERVOIR

Regional porosity verses depth profiles predict an average porosity for the middle *M.diversus* of 23% and 18% for the Palaeocene. The lead is approximately 100 metres up dip of Pelican Field at the top of the middle *M.diversus* which provides the possibility of improved permeability preservation, compared to that which occurs in Pelican 5. Reservoir risk is therefore considered to be low at the middle *M.diversus* and high in the Palaeocene.

SEAL

Vertical sealing is considered low risk and is dependent on intraformational seals. All mapped closure is also dependent on fault plane sealing. Sealing risk is therefore considered to be moderate at the Palaeocene and moderate to high at the middle *M.diversus*.

STRUCTURE

The current seismic grid provides a high level of confidence in the structural interpretation. Structural growth occurred along the bounding fault at Eddystone through to the near top of the EVCM. Trap development occurred at the top of the upper *M.diversus*. Eddystone provides a larger, slightly shallower and more simple fault dependent closure than those tested in the nearby Pelican Field. Structural risk is rated as low.

ADDITIONAL WORK REQUIRED

Seismic control is good and the lead is likely to mature to prospect status following remapping incorporating reprocessed seismic data.

EDDYSTONE - T/25P

EVCM Middle M diversus zone

RESERVES CALCULATION (Simple Slab Model)

	Depth (m)	Vertical Closure (m)	Area (sq km)	Bulk Rock Volume (cubic m)	Cum. OGIP (BCF)	Cum. Raw Gas (BCF)	Cum. Sales Gas (BCF)	Cum. Sales Gas (PJ)	Cum. Condensate (MMSTB)	Cum. OOIP (MMSTB)	Cum. REC. OIL (MMSTB)
1880	2413.3	10	0.76	2.28E+07	29.49	25.07	17.55	19.39	2.51	16.43	4.11
1890	2430.1	26.8	1.65	4.94E+07	63.85	54.27	37.99	41.97	5.43	35.57	8.89
1900	2447	43.7	3.17	9.52E+07	122.93	104.49	73.14	80.81	10.45	68.48	17.12
1910	2464	60.7	5.15	1.55E+08	199.60	169.66	118.76	131.21	16.97	111.19	27.80
1920	2484.9	81.6	11.69	3.51E+08	452.90	384.96	269.47	297.72	38.50	252.29	63.07
1930	2505.8	102.5	18.66	5.60E+08	723.01	614.56	430.19	475.28	61.46	402.76	100.69

RISKED SALES GAS (PJ)	63.88
RISKED REC OIL (MMSTB)	6.77

Input Parameters	
Net Pay (m)	30
Porosity	0.23
Sh	0.75
Bg	212
Boi	1.51
Condensate (BBL's/MMSCF)	100
Recovery factor (gas)	0.85
Recovery factor (oil)	0.25
Sales factor (gas)	0.7

RISK	%
SOURCE GAS	80%
SOURCE OIL	40%
SEAL	40%
RESERVOIR	70%
STRUCTURE	60%
CHANCE OF SUCCESS GAS	13.44%
CHANCE OF SUCCESS OIL	6.72%

24/05/94

491216

491217

EDDYSTON.XLS

EDDYSTONE - T/25P

EVCM Palaeocene

RESERVES CALCULATION (Simple Slab Model)

	Depth (m)	Vertical Closure (m)	Area (sq km)	Bulk Rock Volume (cubic m)	Cum. OGIP (BCF)	Cum. Raw Gas (BCF)	Cum. Sales Gas (BCF)	Cum. Sales Gas (PJ)	Cum. Condensate (MMSTB)	Cum. OOIP (MMSTB)	Cum. REC. OIL (MMSTB)
2130	2885.6	10	0.50	1.51E+07	16.22	13.79	9.65	10.66	1.38	11.67	2.92
2140	2902.3	26.7	1.78	5.34E+07	57.31	48.71	34.10	37.67	4.87	41.24	10.31
2150	2917.7	42.1	3.44	1.03E+08	110.63	94.04	65.83	72.73	9.40	79.61	19.90
2160	2933.8	58.2	5.61	1.68E+08	180.46	153.39	107.37	118.63	15.34	129.86	32.46
2170	2952.5	76.9	7.56	2.27E+08	243.34	206.84	144.79	159.96	20.68	175.11	43.78
2180	2971.3	95.7	9.64	2.89E+08	310.05	263.54	184.48	203.81	26.35	223.11	55.78
2190	2990	114.4	12.54	3.76E+08	403.66	343.11	240.18	265.35	34.31	290.47	72.62
2200	3010	134.4	14.96	4.49E+08	481.44	409.22	286.45	316.48	40.92	346.44	86.61
2210	3030	154.4	17.35	5.20E+08	558.18	474.46	332.12	366.93	47.45	401.66	100.42
2220	3048.2	172.6	19.49	5.85E+08	627.30	533.21	373.25	412.37	53.32	451.40	112.85
2230	3066.3	190.7	20.91	6.27E+08	672.90	571.97	400.38	442.34	57.20	484.22	121.05
2240	3086.1	210.5	21.95	6.59E+08	706.37	600.41	420.29	464.34	60.04	508.30	127.07

RISKED SALES GAS (PJ)	33.43
RISKED REC OIL (MMSTB)	3.43

Input Parameters	
Net Pay (m)	30
Porosity	0.18
Sh	0.75
Bg	225
Boi	1.10
Condensate (BBL's/MMSCF)	100
Recovery factor (gas)	0.85
Recovery factor (oil)	0.25
Sales factor (gas)	0.7

RISK	%
SOURCE GAS	80%
SOURCE OIL	30%
SEAL	50%
RESERVOIR	30%
STRUCTURE	60%
CHANCE OF SUCCESS GAS	7.20%
CHANCE OF SUCCESS OIL	2.70%

24/05/94

491218

SAGASCO Resources Ltd.

T/25 P – EDDYSTONE STRONG LEAD TOP PALAEOCENE

145° 45'

145° 50'

40° 20'

40° 25'

40° 30'

PELICAN 3

TOURVILLE

HILLIARD

PELICAN 2

ACTAEON

PELICAN FIELD

PELICAN 1

PELICAN 5

GRINDSTONE

PELICAN 4

EDDYSTONE

5 cm

0 Km 6

No: 10676.0794 FIG. 11.19

491219

SAGASCO Resources Ltd.

T /25P – EDDYSTONE STRONG LEAD TOP MID *M.DIVERSUS*

145° 50'

40° 20'

40° 25'

PELICAN 3

PELICAN 2

PELICAN 1

PELICAN 5

PELICAN 4

TOURVILLE

WARREGO

ACTAEON

EDDYSTONE

GRINDSTONE

SURVILLE

HUNTER

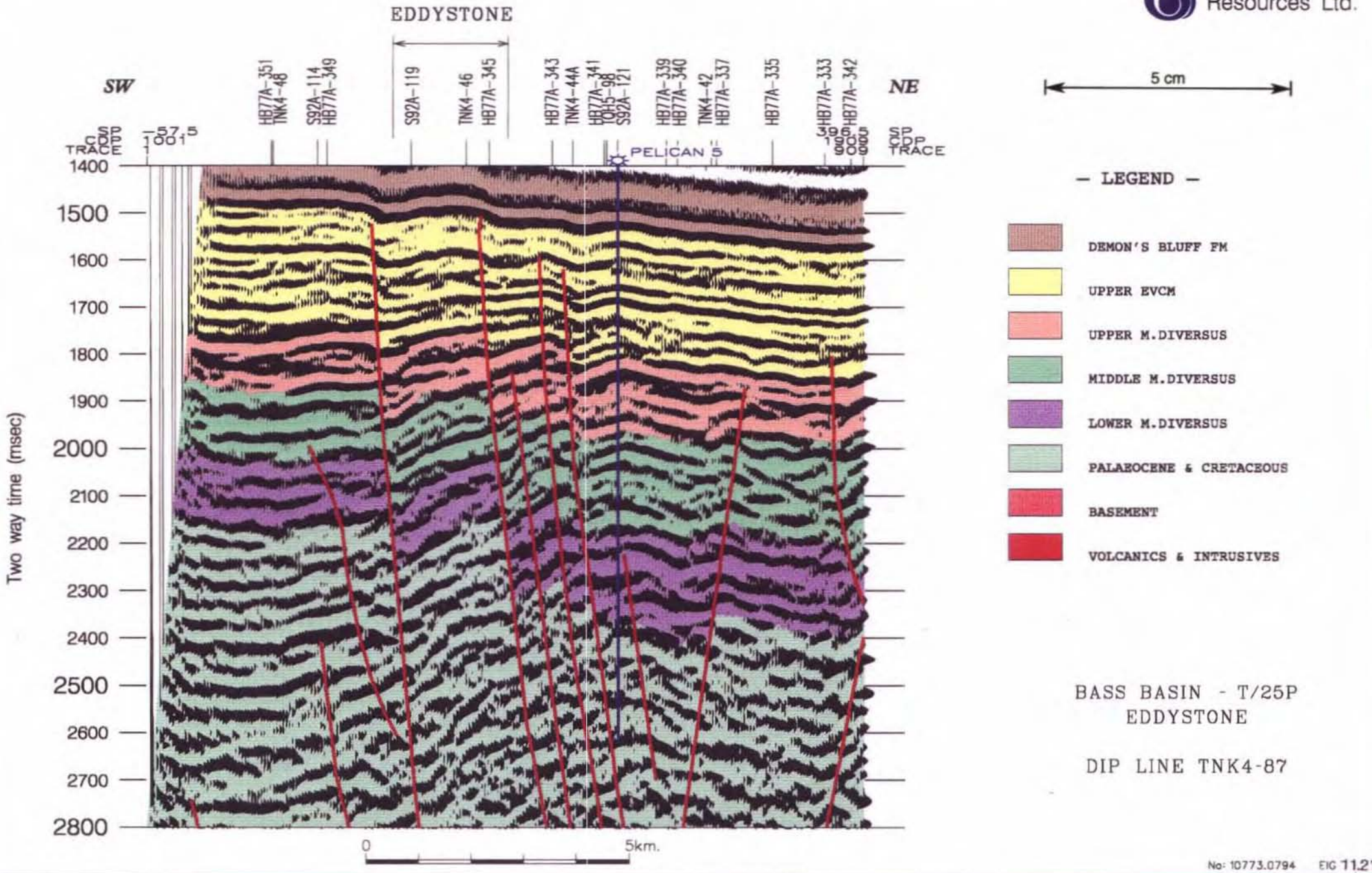
5 cm

0 Km 6

No: 10660.0794 FIG. 11.20

491220

SAGASCO Resources Ltd.



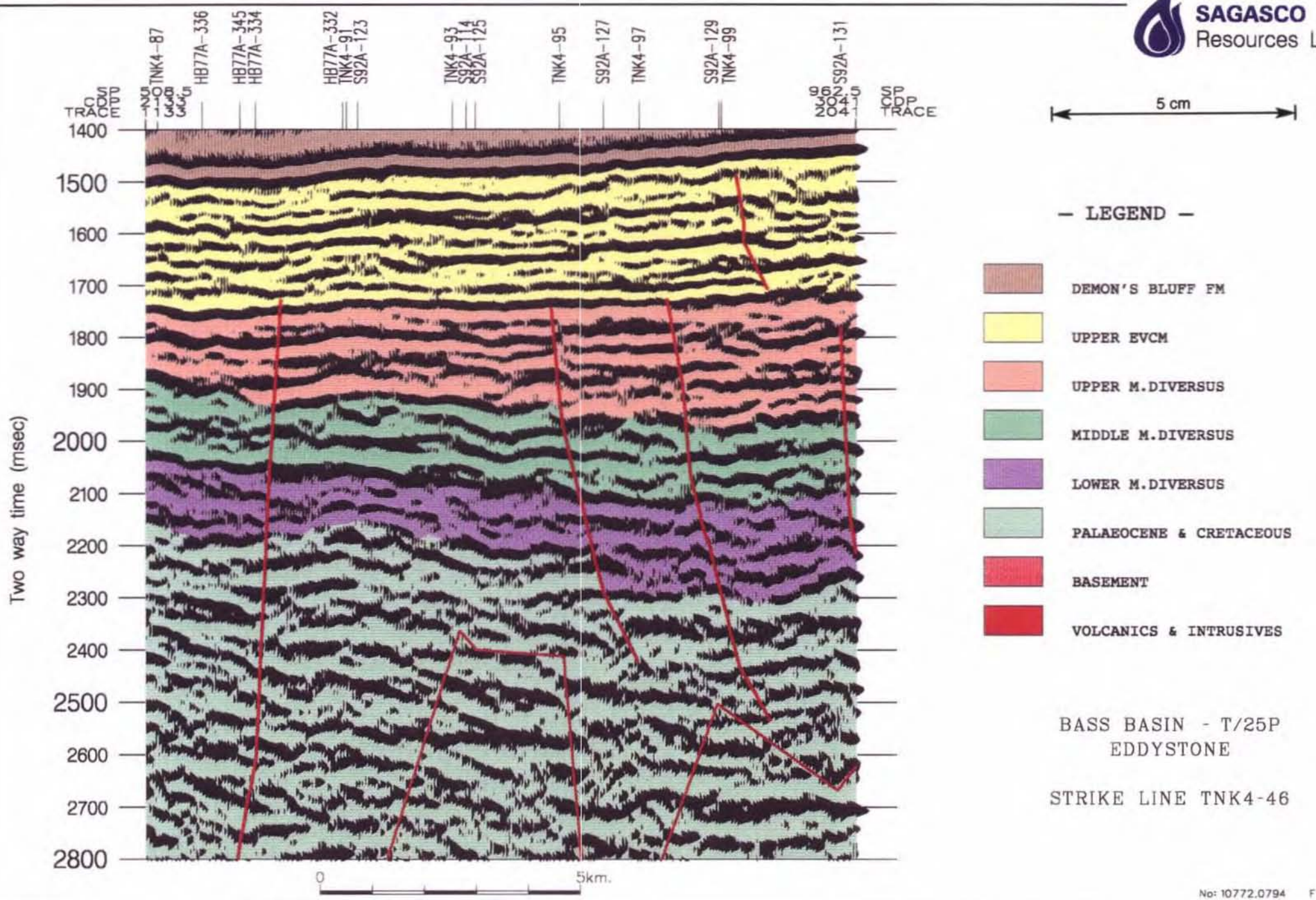
BASS BASIN - T/25P
EDDYSTONE

DIP LINE TNK4-87

No: 10773.0794 EIG 11.21

491221

SAGASCO Resources Ltd.



BASS BASIN - T/25P
EDDYSTONE

STRIKE LINE TNK4-46

No: 10772.0794 FIG 11.22

PROSPECT DATA SHEET

GRINDSTONE

CATEGORY	Strong Lead			
LOCATION	Seismic line S92A-119 Sp 620 (middle *M.diversus*) Seismic line HB77A-342 at intersection with HB77A-349 (Palaeocene)			
DESCRIPTION OF TRAP	Tilted fault block on the upthrown side of a northwest trending fault southwest of Pelican Field.			
PRIMARY OBJECTIVES	EVCM	-	Middle *M.diversus* Palaeocene	
MAXIMUM CLOSURE	EVCM	-	Middle *M.diversus* Palaeocene	4.7 square kilometres 8.3 square kilometres
SECONDARY OBJECTIVES	None			
DEPTH TO TOP RESERVOIR	EVCM	-	Middle *M.diversus* Palaeocene	2378 mSS 2775 mSS

DESCRIPTION OF RISK ELEMENTS

SOURCE

Grindstone is located directly above the mature source kitchen for the Pelican Field gas and condensate accumulation and therefore is ideally located to receive vertical hydrocarbon charge. At Grindstone the middle *M.diversus* is early mature for oil generation increasing to mid mature at the top Palaeocene and late gas generation at basement.

Migration to Grindstone is also possible from proximal mature source rocks downdip and along strike from the structure. Source risk is evaluated to be low for gas, high for oil at the Palaeocene and moderate to high for oil at the middle *M.diversus*.

RESERVOIR

Regional porosity verses depth profiles predict that the middle *M.diversus* will have an average porosity of 24% declining to 19% at the top of the Palaeocene. The porosity predictions reflect the fact that Grindstone is updip of Eddystone and in turn Pelican Field. This improvement in porosity is also likely to be reflected in better permeability preservation.

Reservoir risk is evaluated to be high for the Palaeocene and low for the middle *M.diversus*.

SEAL

Vertical sealing is considered low risk and is dependent on intraformational seals. All mapped closure is dependent on fault plane sealing. Seal risk is moderate to high for the middle *M.diversus* and moderate for the Palaeocene.

STRUCTURE

The current seismic grid provides a high level of confidence in the structural interpretation. Grindstone is possibly not large enough for a stand alone project but could form a useful addition to any development should Eddystone be successful. The igneous intrusive sill associated with the Flinders structure terminates before reaching Grindstone and does not affect prospectivity.

The trapping geometry at Grindstone developed at the lower *M.diversus*, with fault movement occurring until the top of the EVCM. Structural risk is evaluated to be moderate.

ADDITIONAL WORK REQUIREMENTS

No additional work is planned for Grindstone.

491224

GRINDST.XLS

GRINDSTONE - T/25P

EVCM Middle M diversus zone

RESERVES CALCULATION (Simple Slab Model)

	Depth (m)	Vertical Closure (m)	Area (sq km)	Bulk Rock Volume (cubic m)	Cum. OGIP (BCF)	Cum. Raw Gas (BCF)	Cum. Sales Gas (BCF)	Cum. Sales Gas (PJ)	Cum. Condensate (MMSTB)	Cum. OOIP (MMSTB)	Cum. REC. OIL (MMSTB)
1860	2378	10	0.85	2.56E+07	34.48	29.31	20.52	22.67	2.93	19.31	4.83
1870	2396.7	28.7	4.73	1.42E+08	191.38	162.67	113.87	125.81	16.27	107.14	26.78

RISKED SALES GAS (PJ)	12.75
RISKED REC OIL (MMSTB)	1.50

Input Parameters	
Net Pay (m)	30
Porosity	0.24
Sh	0.75
Bg	212
Boi	1.50
Condensate (BBL's/MMSCF)	100
Recovery factor (gas)	0.85
Recovery factor (oil)	0.25
Sales factor (gas)	0.7

RISK	%
SOURCE GAS	80%
SOURCE OIL	40%
SEAL	40%
RESERVOIR	70%
STRUCTURE	50%
CHANCE OF SUCCESS GAS	11.20%
CHANCE OF SUCCESS OIL	5.60%

24/05/94

491225

GRINDST.XLS

GRINDSTONE - T/25P

EVCM Palaeocene

RESERVES CALCULATION (Simple Slab Model)

	Depth (m)	Vertical Closure (m)	Area (sq km)	Bulk Rock Volume (cubic m)	Cum. OGIP (BCF)	Cum. Raw Gas (BCF)	Cum. Sales Gas (BCF)	Cum. Sales Gas (PJ)	Cum. Condensate (MMSTB)	Cum. OOIP (MMSTB)	Cum. REC. OIL (MMSTB)
2080	2775.3	10	0.19	5.79E+06	6.50	5.52	3.87	4.27	0.55	3.28	0.82
2090	2791.1	25.8	1.84	5.51E+07	61.88	52.60	36.82	40.68	5.26	31.19	7.80
2100	2806.9	41.6	3.65	1.10E+08	122.98	104.53	73.17	80.84	10.45	62.00	15.50
2110	2836.6	71.3	5.41	1.62E+08	182.20	154.87	108.41	119.77	15.49	91.85	22.96
2120	2863.3	98	8.30	2.49E+08	279.32	237.42	166.20	183.62	23.74	140.81	35.20

RISKED SALES GAS (PJ)	11.02
RISKED REC OIL (MMSTB)	0.79

Input Parameters	
Net Pay (m)	30
Porosity	0.19
Sh	0.75
Bg	223
Boi	1.58
Condensate (BBL's/MMSCF)	100
Recovery factor (gas)	0.85
Recovery factor (oil)	0.25
Sales factor (gas)	0.7

RISK	%
SOURCE GAS	80%
SOURCE GAS	30%
SEAL	50%
RESERVOIR	30%
STRUCTURE	50%
TOTAL	6.00%
TOTAL	2.25%

24/05/94

491226

SAGASCO Resources Ltd.

T/25P –GRINDSTONE STRONG LEAD TOP PALAEOCENE

145° 50'

145° 55'

40° 20'

40° 25'

NARIMBA 1

TOURVILLE

PELICAN 3

HILLIARD

PELICAN 2

PELICAN FIELD

PELICAN 1

PELICAN 5

PELICAN 4

GRINDSTONE

EDDYSTONE

0 Km 6

5 cm

No: 10677.0794 FIG. 11.23

491227

SAGASCO Resources Ltd.

T /25P – GRINDSTONE STRONG LEAD TOP MID *M.DIVERSUS*

145° 50'

40° 20'

40° 25'

TOURVILLE

WARREGO

ACTAEON

EDDYSTONE

GRINDSTONE

SURVILLE

HUNTER

PELICAN 1

PELICAN 2

PELICAN 3

PELICAN 4

PELICAN 5

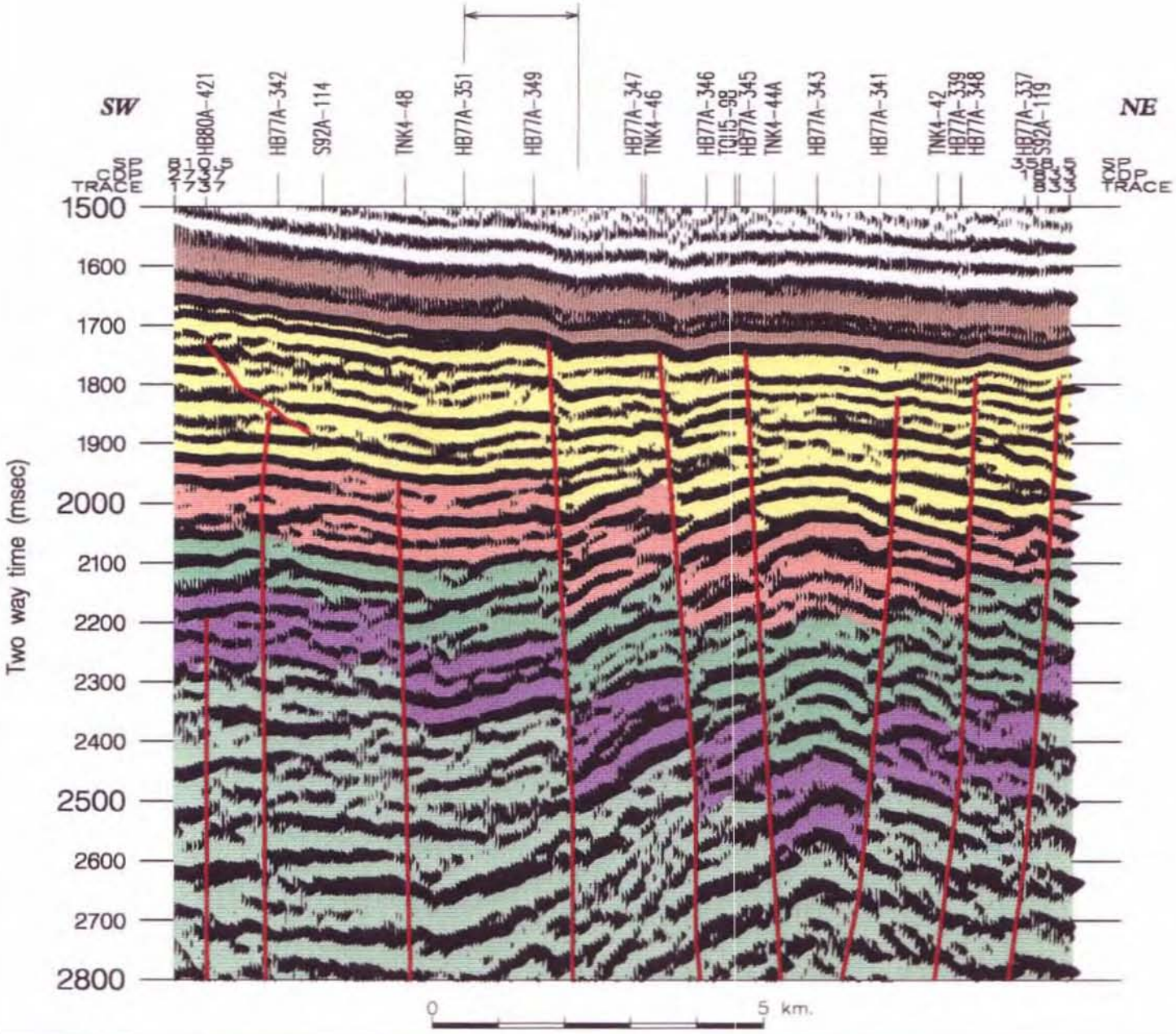
5 cm

0 Km 6

No: 10857.0894 FIG. 11.24

SAGASCO Resources Ltd.

GRINDSTONE



5 cm

— LEGEND —

- DEMON'S BLUFF FM
- UPPER EVCM
- UPPER M.DIVERSUS
- MIDDLE M.DIVERSUS
- LOWER M.DIVERSUS
- PALAEOCENE & CRETACEOUS
- BASEMENT
- VOLCANICS & INTRUSIVES

BASS BASIN - T/25P
GRINDSTONE

DIP LINE TNK4-83

No: 10779.0794 FIG. 11.25

491228

PROSPECT DATA SHEET

HILLIARD

CATEGORY	Strong Lead		
LOCATION	Seismic line TNK4-83 Sp 405 (middle *M.diversus*) Seismic line HB77A-339 between HB77A-350 and HB77A-352 (Palaeocene)		
DESCRIPTION OF TRAP	Tilted fault block on the upthrown side of a northwest trending fault.		
PRIMARY OBJECTIVES	EVCM -	Middle *M.diversus* Palaeocene	
MAXIMUM CLOSURE	EVCM -	Middle *M.diversus*	4.5 and 4.5 square kilometres
		Palaeocene	17.6 square kilometres
SECONDARY OBJECTIVES	None		
DEPTH TO TOP RESERVOIR	EVCM -	Middle *M.diversus*	2485 and 2577 mSS
		Palaeocene	3125 mSS

DESCRIPTION OF RISK ELEMENTS

SOURCE

Hilliard is located adjacent to the mature source kitchen for the Pelican Field gas and condensate accumulation and therefore is ideally located to receive hydrocarbon charge. At Hilliard the middle *M.diversus* is early mature for oil generation increasing to mid-late mature at the top Palaeocene and to the main-late gas generation phase at basement.

Migration to Hilliard is possible by vertical migration or from face loading configurations of, Early Cretaceous source to Palaeocene reservoirs, Palaeocene source to lower *M.diversus* reservoirs and lower *M.diversus* source to middle *M.diversus* reservoirs. Overall source risk is considered to be low particularly for Hilliard East because of known gas at Pelican 1 and 5.

RESERVOIR

Regional porosity verses depth profiles predict that middle *M.diversus* reservoirs will have average porosities of 23% declining to 15% at the top of the Palaeocene. Therefore the middle *M.diversus* is considered low risk for reservoir development (similar to Pelican Field), whilst the Palaeocene is considered high risk.

SEAL

Vertical sealing is considered low risk and is dependent on intraformational seals. All mapped closure is dependent on fault plane sealing. Overall seal risk is ranked as moderate to high for the middle *M.diversus* and moderate for the Palaeocene.

STRUCTURE

The current seismic grid provides a moderate level of confidence in the structural interpretation. Two areas of closure exist, Hilliard West and Hilliard East, separated by northwest trending faulting. In addition there is a possibility that the Hilliard East closure extends to include the Pelican 1 and 5 wells. Trap development commenced at Hilliard in the lower *M.diversus* with fault movement persisting until the near top of the EVCM.

At the middle *M.diversus* structural closure is cut by a fault trending northwest - southeast, the two closures being referred to as Hilliard East and West. The closure at Hilliard East may be extended downdip to include a closure around the gas and condensate accumulation at Pelican 1 and Pelican 5. At the Palaeocene level only one closure is present. Structural risk at Hilliard is rated as low to moderate at all levels.

ADDITIONAL WORK REQUIREMENTS

Additional seismic data was recorded over Hilliard during the Rocky Cape Seismic Survey which may elevate the structure to prospect status after remapping. The remapping should address a possible link to the Pelican 1 and 5 gas condensate accumulation.

491231

HILLE.XLS

HILLIARD EAST - T/25P

EVCM Middle M diversus zone

RESERVES CALCULATION (Simple Slab Model)

	Depth (m)	Vertical Closure (m)	Area (sq km)	Bulk Rock Volume (cubic m)	Cum. OGIP (BCF)	Cum. Raw Gas (BCF)	Cum. Sales Gas (BCF)	Cum. Sales Gas (PJ)	Cum. Condensate (MMSTB)	Cum. OOIP (MMSTB)	Cum. REC. OIL (MMSTB)
1920	2484.9	10	0.13	3.81E+06	4.99	4.24	2.97	3.28	0.42	2.71	0.68
1930	2505.8	30.9	0.38	1.13E+07	14.77	12.56	8.79	9.71	1.26	8.03	2.01
1940	2524.5	49.6	0.93	2.78E+07	36.42	30.96	21.67	23.94	3.10	19.81	4.95
1950	2542.6	67.7	1.83	5.48E+07	71.71	60.95	42.66	47.14	6.09	39.00	9.75
1960	2559.9	85	2.80	8.39E+07	109.94	93.44	65.41	72.27	9.34	59.79	14.95
1970	2576.6	101.7	4.48	1.34E+08	176.10	149.69	104.78	115.76	14.97	95.77	23.94

RISKED SALES GAS (PJ)	15.56
RISKED REC OIL (MMSTB)	0.80

Input Parameters	
Net Pay (m)	30
Porosity	0.23
Sh	0.75
Bg	215
Boi	1.52
Condensate (BBL's/MMSCF)	100
Recovery factor (gas)	0.85
Recovery factor (oil)	0.25
Sales factor (gas)	0.7

RISK	%
SOURCE GAS	80%
SOURCE OIL	20%
SEAL	40%
RESERVOIR	70%
STRUCTURE	60%
CHANCE OF SUCCESS GAS	13.44%
CHANCE OF SUCCESS OIL	3.36%

24/05/94

HILLW.XLS

HILLIARD WEST - T/25P

EVCM Middle M diversus zone

RESERVES CALCULATION (Simple Slab Model)

	Depth (m)	Vertical Closure (m)	Area (sq km)	Bulk Rock Volume (cubic m)	Cum. OGIP (BCF)	Cum. Raw Gas (BCF)	Cum. Sales Gas (BCF)	Cum. Sales Gas (PJ)	Cum. Condensate (MMSTB)	Cum. OOIP (MMSTB)	Cum. REC. OIL (MMSTB)
1970	2576.6	10	0.42	1.25E+07	15.85	13.47	9.43	10.42	1.35	8.33	2.08
1980	2593.9	27.3	2.24	6.71E+07	85.21	72.43	50.70	56.01	7.24	44.79	11.20
1990	2617	50.4	4.46	1.34E+08	169.84	144.37	101.06	111.65	14.44	89.28	22.32

RISKED SALES GAS (PJ)	15.01
RISKED REC OIL (MMSTB)	0.75

Input Parameters	
Net Pay (m)	30
Porosity	0.22
Sh	0.75
Bg	218
Boi	1.55
Condensate (BBL's/MMSCF)	100
Recovery factor (gas)	0.85
Recovery factor (oil)	0.25
Sales factor (gas)	0.7

RISK	%
SOURCE GAS	80%
SOURCE OIL	20%
SEAL	40%
RESERVOIR	70%
STRUCTURE	60%
CHANCE OF SUCCESS GAS	13.44%
CHANCE OF SUCCESS OIL	3.36%

24/05/94

491233

HILLPEL.XLS

HILLIARD EAST to PELICAN (1,5) - T/25P

EVCM Middle M diversus zone

RESERVES CALCULATION (Simple Slab Model)

	Depth (m)	Vertical Closure (m)	Area (sq km)	Bulk Rock Volume (cubic m)	Cum. OGIP (BCF)	Cum. Raw Gas (BCF)	Cum. Sales Gas (BCF)	Cum. Sales Gas (PJ)	Cum. Condensate (MMSTB)	Cum. OOIP (MMSTB)	Cum. REC. OIL (MMSTB)
1920	2484.9	10	0.13	3.81E+06	4.99	4.24	2.97	3.28	0.42	2.71	0.68
1930	2505.8	30.9	0.38	1.13E+07	14.77	12.56	8.79	9.71	1.26	8.03	2.01
1940	2524.5	49.6	0.93	2.78E+07	36.42	30.96	21.67	23.94	3.10	19.81	4.95
1950	2542.6	67.7	2.47	7.40E+07	96.89	82.36	57.65	63.69	8.24	52.69	13.17
1960	2559.9	85	5.89	1.77E+08	231.50	196.78	137.74	152.18	19.68	125.90	31.48
1970	2576.6	101.7	13.33	4.00E+08	523.66	445.12	311.58	344.24	44.51	284.80	71.20
1980	2593.9	119	21.10	6.33E+08	829.07	704.71	493.30	545.00	70.47	450.90	112.72

RISKED SALES GAS (PJ)	73.25
RISKED REC OIL (MMSTB)	3.79

Input Parameters	
Net Pay (m)	30
Porosity	0.23
Sh	0.75
Bg	215
Boi	1.52
Condensate (BBL's/MMSCF)	100
Recovery factor (gas)	0.85
Recovery factor (oil)	0.25
Sales factor (gas)	0.7

RISK	%
SOURCE GAS	80%
SOURCE OIL	20%
SEAL	40%
RESERVOIR	70%
STRUCTURE	60%
CHANCE OF SUCCESS GAS	13.44%
CHANCE OF SUCCESS OIL	3.36%

24/05/94

HILLE.XLS

HILLIARD - T/25P

EVCM Palaeocene

RESERVES CALCULATION (Simple Slab Model)

	Depth (m)	Vertical Closure (m)	Area (sq km)	Bulk Rock Volume (cubic m)	Cum. OGIP (BCF)	Cum. Raw Gas (BCF)	Cum. Sales Gas (BCF)	Cum. Sales Gas (PJ)	Cum. Condensate (MMSTB)	Cum. OOIP (MMSTB)	Cum. REC. OIL (MMSTB)
2260	3124.6	10	0.52	1.57E+07	14.34	12.19	8.53	9.42	1.22	6.70	1.67
2270	3142.7	28.1	2.06	6.19E+07	56.55	48.07	33.65	37.17	4.81	26.41	6.60
2280	3160	45.4	4.44	1.33E+08	121.63	103.38	72.37	79.95	10.34	56.81	14.20
2290	3176.7	62.1	6.69	2.01E+08	183.25	155.76	109.03	120.46	15.58	85.59	21.40
2300	3193.8	79.2	8.72	2.62E+08	239.14	203.27	142.29	157.20	20.33	111.70	27.93
2310	3212.5	97.9	10.33	3.10E+08	283.22	240.74	168.52	186.18	24.07	132.29	33.07
2320	3231.3	116.7	11.79	3.54E+08	323.16	274.69	192.28	212.43	27.47	150.94	37.74
2330	3250	135.4	13.70	4.11E+08	375.57	319.24	223.47	246.89	31.92	175.43	43.86
2340	3268.2	153.6	15.63	4.69E+08	428.40	364.14	254.90	281.61	36.41	200.10	50.02
2350	3286.3	171.7	17.57	5.27E+08	481.55	409.32	286.52	316.55	40.93	224.93	56.23

RISKED SALES GAS (PJ)	22.79
RISKED REC OIL (MMSTB)	1.01

Input Parameters	
Net Pay (m)	30
Porosity	0.15
Sh	0.75
Bg	230
Boi	1.66
Condensate (BBL's/MMSCF)	100
Recovery factor (gas)	0.85
Recovery factor (oil)	0.25
Sales factor (gas)	0.7

RISK	%
SOURCE GAS	80%
SOURCE OIL	20%
SEAL	50%
RESERVOIR	30%
STRUCTURE	60%
CHANCE OF SUCCESS GAS	7.20%
CHANCE OF SUCCESS OIL	1.80%

24/05/94

491235

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T/25P – HILLIARD STRONG LEAD TOP PALAEOCENE

145° 45'

145° 50'

40° 15'

40° 20'

ADAMSON

NARIMBA 1

PELICAN 3

PELICAN 2

TOURVILLE

HILLIARD

PELICAN FIELD

PELICAN 1

PELICAN 5

PELICAN 4

GRINDSTONE

EDDYSTONE

5 cm

0 Km 6

No: 10678.0794 FIG.11.26

491236

SAGASCO Resources Ltd.

T /25P – HILLIARD STRONG LEAD
TOP MID *M.DIVERSUS*

145° 50'

40° 15'

40° 20'

CAPE BARREN

ADAMSON

TOURVILLE

WARREGO

ACTAEON

EDDYSTONE

SURVILLE

PELICAN 1

PELICAN 2

PELICAN 3

PELICAN 4

PELICAN 5

HILLIARD

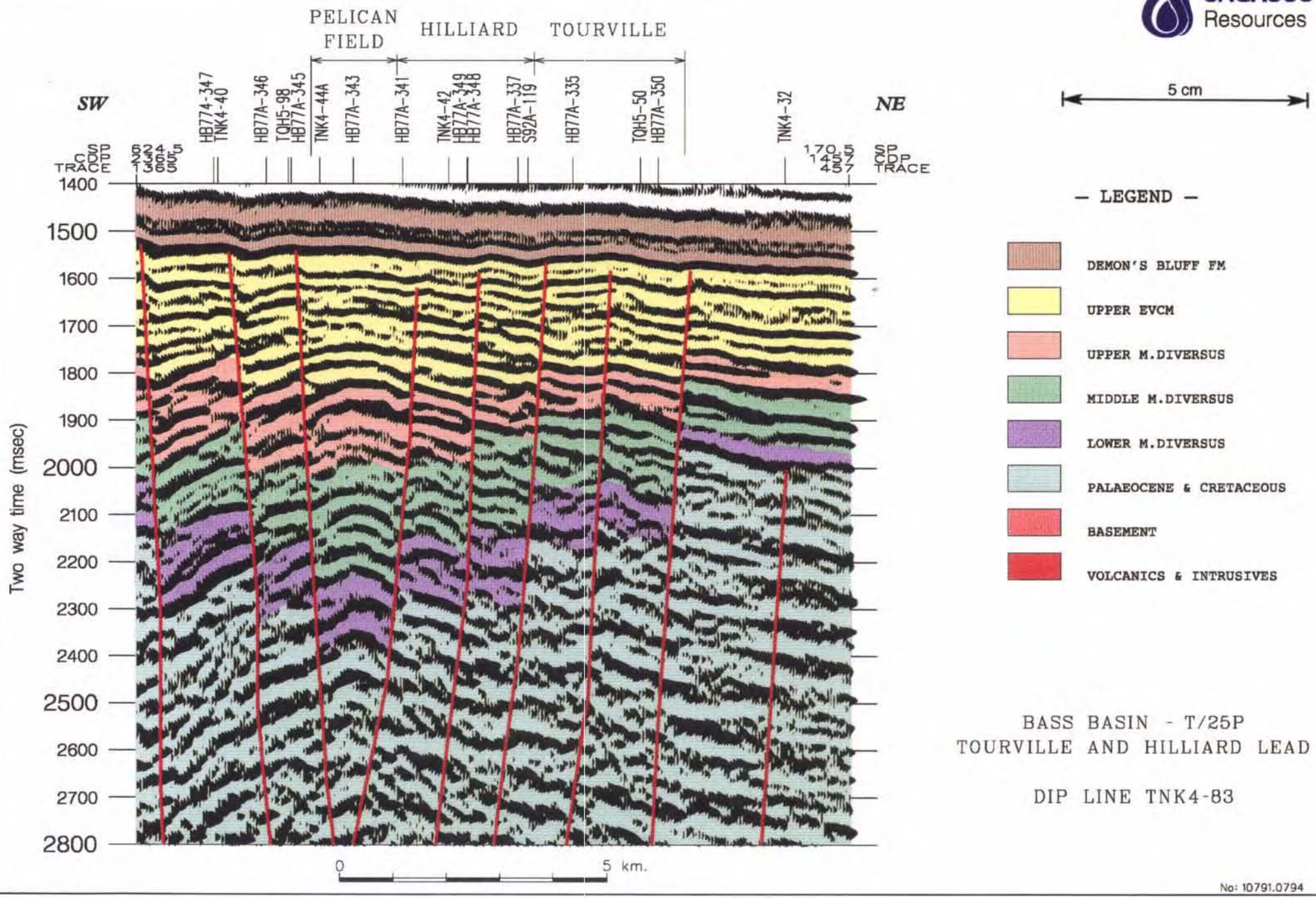
5 cm

0 Km 6

No: 10858.0894 FIG.11.27

491237

SAGASCO Resources Ltd.



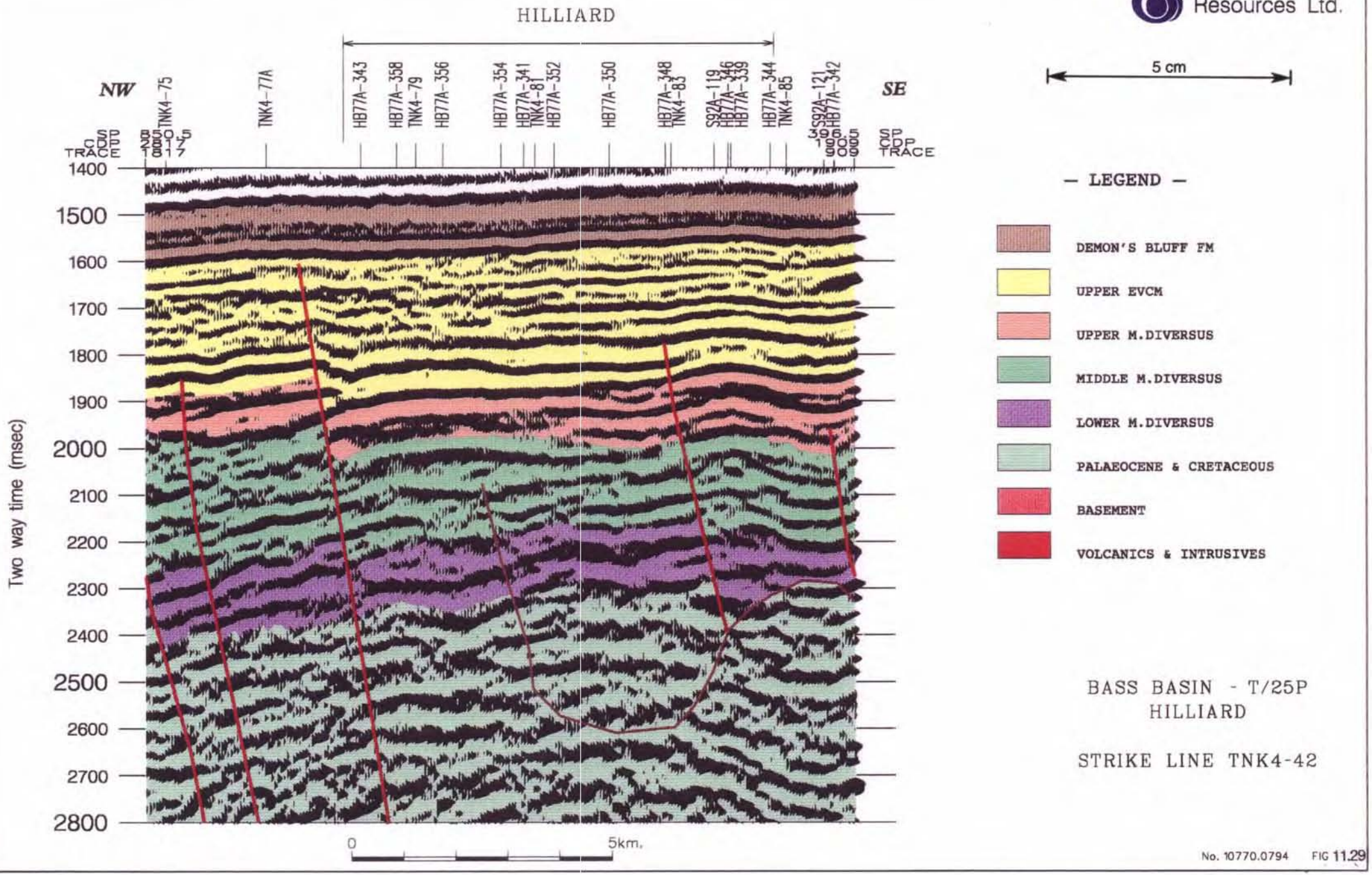
BASS BASIN - T/25P
TOURVILLE AND HILLIARD LEAD

DIP LINE TNK4-83

No: 10791.0794 FIG.11.28

491238

SAGASCO Resources Ltd.



BASS BASIN - T/25P
HILLIARD

STRIKE LINE TNK4-42

No. 10770.0794 FIG 11.29

PROSPECT DATA SHEET

HUNTER

CATEGORY	Lead		
LOCATION	Seismic line S92A-127 Sp 185 (middle *M.diversus*) Seismic line S92A-127 Sp 190 (Palaeocene)		
DESCRIPTION OF TRAP	Faulted anticline at top EVCM and Upper *M.diversus*, tilted fault block against east-west trending fault at deeper levels.		
PRIMARY OBJECTIVES	EVCM -	top of formation Middle *M.diversus* Palaeocene	
MAXIMUM CLOSURE	EVCM -	Upper *M.diversus* Middle *M.diversus* Palaeocene	9.1 square kilometres 6.5 square kilometres 8.0 square kilometres
SECONDARY OBJECTIVES	EVCM -	Upper *M.diversus*	
DEPTH TO TOP RESERVOIR	EVCM -	Middle *M.diversus* Palaeocene	2119 mSS 2485 MSS

DESCRIPTION OF RISK ELEMENTS

SOURCE

Hunter is located on the Southwestern Ramp structural province and requires fairly distant migration from the more mature areas of the Pelican Trough to fill any trapping configuration or upon vertical migration from more deeply buried and more proximal mature source rock sequences. At Hunter the middle *M.diversus* is early mature for oil generation increasing to early-mid mature at the top Palaeocene and to the main gas generation phase at basement.
Source risk is considered to be moderate to high for the middle *M.diversus*, upper *M.diversus* and upper EVCM and moderate for the Palaeocene.

RESERVOIR

The Hunter lead is significantly updip of the wells drilled in the Pelican Trough, and consequently better quality reservoirs are predicted. At the upper *M.diversus* average porosity is predicted to be 29% declining to 26% at the middle *M.diversus* and 22% at the top Palaeocene. The reservoir risk for Hunter is therefore considered to be low in all upper targets, whilst the Palaeocene reservoir risk is low to moderate.

SEAL

Vertical sealing is considered medium risk and is dependent on intraformational seals and in the case of the top EVCM sandstone the regional sealing unit of the Demons Bluff Formation. Crestal keystone faulting at the top EVCM and upper *M.diversus* increases the risk of seal leakage at these levels. Below the upper *M.diversus* all mapped closure is dependent on fault plane sealing. Sealing risk is low for the top EVCM, high for the upper *M.diversus*, moderate to high for the middle *M.diversus* and moderate for the Palaeocene.

STRUCTURE

The existing seismic grid at Hunter provides inadequate seismic coverage to define a drilling location. Structural closure at the top EVCM and upper *M.diversus* is probably of Miocene age, related to the emplacement of a probable Miocene age intrusion (sill) at the base of the lower *M.diversus* sediments, analogous to the Flinders structure on trend to the northwest. This adds risk to exploration in the upper part of the EVCM. However below the upper *M.diversus*, in contrast to Flinders, there is well defined structural relief at the middle *M.diversus* and top Palaeocene levels.

Mapping of the bounding fault is difficult because of its location near the edge of a seismic grid and therefore there is increased risk associated with its continuity and orientation.

Structural risk at Hunter is low at the upper EVCM and upper *M.diversus*, high at the middle *M.diversus* and very high at the Palaeocene.

ADDITIONAL WORK REQUIREMENTS

Additional seismic data is required to confirm closure, particularly at the more prospective deeper levels.

HUNTER.XLS

HUNTER - T/25P

Upper EVCM

RESERVES CALCULATION (Simple Slab Model)

	Depth (m)	Vertical Closure (m)	Area (sq km)	Bulk Rock Volume (cubic m)	Cum. OGIP (BCF)	Cum. Raw Gas (BCF)	Cum. Sales Gas (BCF)	Cum. Sales Gas (PJ)	Cum. Condensate (MMSTB)	Cum. OOIP (MMSTB)	Cum. REC. OIL (MMSTB)
1330	1562	10	2.40	7.21E+07	102.60	87.21	61.05	67.45	8.72	81.85	20.46
1340	1576	24	7.39	2.22E+08	315.62	268.28	187.80	207.48	26.83	251.79	62.95

RISKED SALES GAS (PJ)	37.18
RISKED REC OIL (MMSTB)	14.10

Input Parameters	
Net Pay (m)	30
Porosity	0.32
Sh	0.75
Bg	168
Boi	1.33
Condensate (BBL's/MMSCF)	100
Recovery factor (gas)	0.85
Recovery factor (oil)	0.25
Sales factor (gas)	0.7

RISK	%
SOURCE GAS	40%
SOURCE OIL	50%
SEAL	70%
RESERVOIR	80%
STRUCTURE	80%
CHANCE OF SUCCESS GAS	17.92%
CHANCE OF SUCCESS OIL	22.40%

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491242

HUNTER - T/25P

EVCM Upper M diversus

RESERVES CALCULATION (Simple Slab Model)

	Depth (m)	Vertical Closure (m)	Area (sq km)	Bulk Rock Volume (cubic m)	Cum. OGIP (BCF)	Cum. Raw Gas (BCF)	Cum. Sales Gas (BCF)	Cum. Sales Gas (PJ)	Cum. Condensate (MMSTB)	Cum. OOIP (MMSTB)	Cum. REC. OIL (MMSTB)
1560	1888.5	10	0.42	1.26E+07	18.58	15.79	11.06	12.21	1.58	12.33	3.08
1570	1903.8	25.3	5.44	1.63E+08	240.54	204.46	143.12	158.12	20.45	159.65	39.91
1580	1920	41.5	9.12	2.74E+08	403.56	343.03	240.12	265.29	34.30	267.85	66.96

RISKED SALES GAS (PJ)	20.37
RISKED REC OIL (MMSTB)	6.43

Input Parameters	
Net Pay (m)	30
Porosity	0.29
Sh	0.75
Bg	192
Boi	1.40
Condensate (BBL's/MMSCF)	100
Recovery factor (gas)	0.85
Recovery factor (oil)	0.25
Sales factor (gas)	0.7

RISK	%
SOURCE GAS	40%
SOURCE OIL	50%
SEAL	30%
RESERVOIR	80%
STRUCTURE	80%
CHANCE OF SUCCESS GAS	7.68%
CHANCE OF SUCCESS OIL	9.60%

24/05/94

HUNTER.XLS

HUNTER - T/25P

EVCM Middle M diversus zone

RESERVES CALCULATION (Simple Slab Model)

	Depth (m)	Vertical Closure (m)	Area (sq km)	Bulk Rock Volume (cubic m)	Cum. OGIP (BCF)	Cum. Raw Gas (BCF)	Cum. Sales Gas (BCF)	Cum. Sales Gas (PJ)	Cum. Condensate (MMSTB)	Cum. OOIP (MMSTB)	Cum. REC. OIL (MMSTB)
1700	2119.2	10	0.06	1.83E+06	2.53	2.15	1.51	1.67	0.22	1.55	0.39
1710	2134.6	25.4	1.10	3.30E+07	45.68	38.82	27.18	30.03	3.88	27.99	7.00
1720	2150	40.8	3.86	1.16E+08	160.28	136.24	95.37	105.36	13.62	98.20	24.55
1730	2168.2	59	6.48	1.94E+08	269.15	228.78	160.15	176.93	22.88	164.91	41.23

RISKED SALES GAS (PJ)	6.79
RISKED REC OIL (MMSTB)	1.58

Input Parameters	
Net Pay (m)	30
Porosity	0.26
Sh	0.75
Bg	201
Boi	1.45
Condensate (BBL's/MMSCF)	100
Recovery factor (gas)	0.85
Recovery factor (oil)	0.25
Sales factor (gas)	0.7

RISK	%
SOURCE GAS	40%
SOURCE OIL	40%
SEAL	40%
RESERVOIR	80%
STRUCTURE	30%
CHANCE OF SUCCESS GAS	3.84%
CHANCE OF SUCCESS OIL	3.84%

24/05/94

491244

HUNTER - T/25P

EVCM Palaeocene

RESERVES CALCULATION (Simple Slab Model)

	Depth (m)	Vertical Closure (m)	Area (sq km)	Bulk Rock Volume (cubic m)	Cum. OGIP (BCF)	Cum. Raw Gas (BCF)	Cum. Sales Gas (BCF)	Cum. Sales Gas (PJ)	Cum. Condensate (MMSTB)	Cum. OOIP (MMSTB)	Cum. REC. OIL (MMSTB)
1920	2484.9	10	0.11	3.27E+06	4.21	3.58	2.51	2.77	0.36	2.23	0.56
1930	2505.8	30.9	0.26	7.77E+06	10.01	8.50	5.95	6.58	0.85	5.29	1.32
1940	2524.5	49.6	0.47	1.41E+07	18.16	15.43	10.80	11.94	1.54	9.61	2.40
1950	2542.7	67.8	0.84	2.53E+07	32.60	27.71	19.40	21.43	2.77	17.25	4.31
1960	2560	85.1	1.23	3.68E+07	47.36	40.26	28.18	31.13	4.03	25.06	6.26
1970	2576.6	101.7	1.84	5.52E+07	71.04	60.39	42.27	46.70	6.04	37.59	9.40
1980	2594	119.1	2.64	7.91E+07	101.83	86.56	60.59	66.94	8.66	53.88	13.47
1990	2614	139.1	3.45	1.03E+08	133.12	113.15	79.21	87.51	11.32	70.43	17.61
2000	2634	159.1	5.01	1.50E+08	193.58	164.54	115.18	127.25	16.45	102.42	25.61
2010	2654	179.1	6.59	1.98E+08	254.58	216.39	151.47	167.35	21.64	134.70	33.67
2020	2673.3	198.4	8.00	2.40E+08	308.86	262.53	183.77	203.03	26.25	163.41	40.85

RISKED SALES GAS (PJ)	6.09
RISKED REC OIL (MMSTB)	0.74

Input Parameters	
Net Pay (m)	30
Porosity	0.22
Sh	0.75
Bg	221
Boi	1.52
Condensate (BBL's/MMSCF)	100
Recovery factor (gas)	0.85
Recovery factor (oil)	0.25
Sales factor (gas)	0.7

RISK	%
SOURCE GAS	50%
SOURCE OIL	30%
SEAL	50%
RESERVOIR	60%
STRUCTURE	20%
CHANCE OF SUCCESS GAS	3.00%
CHANCE OF SUCCESS OIL	1.80%

24/05/94

491245

SAGASCO Resources Ltd.

T/25P – HUNTER LEAD TOP PALAEOCENE

140° 50'

140° 55'

EDDYSTONE

SURVILLE

40° 25'

HUNTER

40° 30'

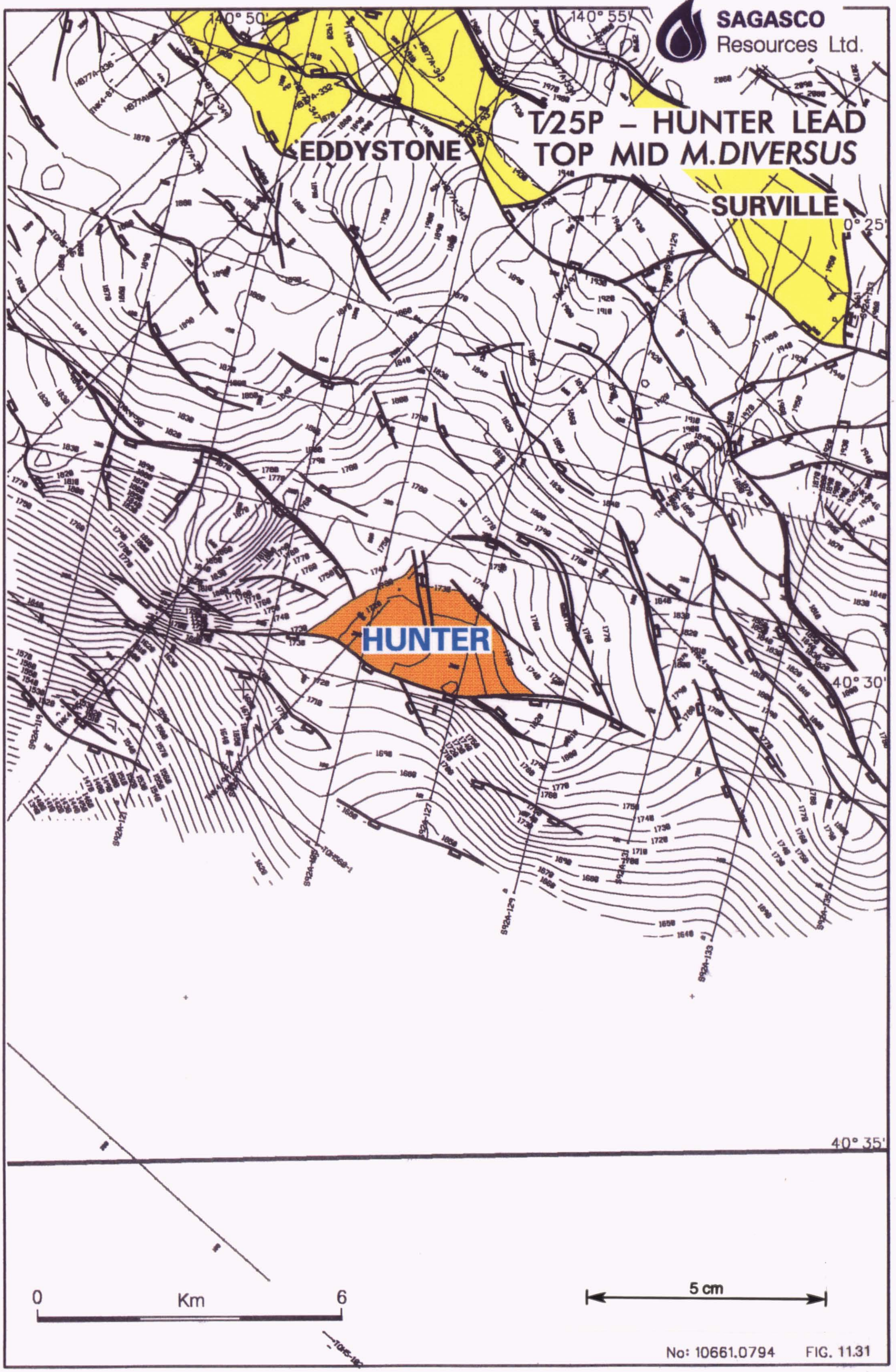
40° 35'

5 cm

0 Km 6

No: 10679.0794 FIG.11.30

491246


SAGASCO
Resources Ltd.
140° 50'
140° 55'
T/25P – HUNTER LEAD
TOP MID M.DIVERSUS
EDDYSTONE
SURVILLE
0° 25'
HUNTER
40° 30'
40° 35'
0
Km
6
5 cm
No: 10661.0794
FIG. 11.31

491247

SAGASCO Resources Ltd.

T /25P – HUNTER LEAD
TOP UPPER *M.DIVERSUS*

140° 50'

140° 55'

40° 25'

40° 30'

40° 35'

HUNTER

T /25P

0 Km 6

5 cm

No: 10668.0794 FIG. 11.32

491248

SAGASCO Resources Ltd.

T /25P – HUNTER LEAD TOP EVCM

140° 50'

140° 55'

40° 25

40° 30'

40° 35'

HUNTER

0 Km 6

5 cm

140° 55'

145° 50'

No: 10671.0794 FIG. 11.33

491249

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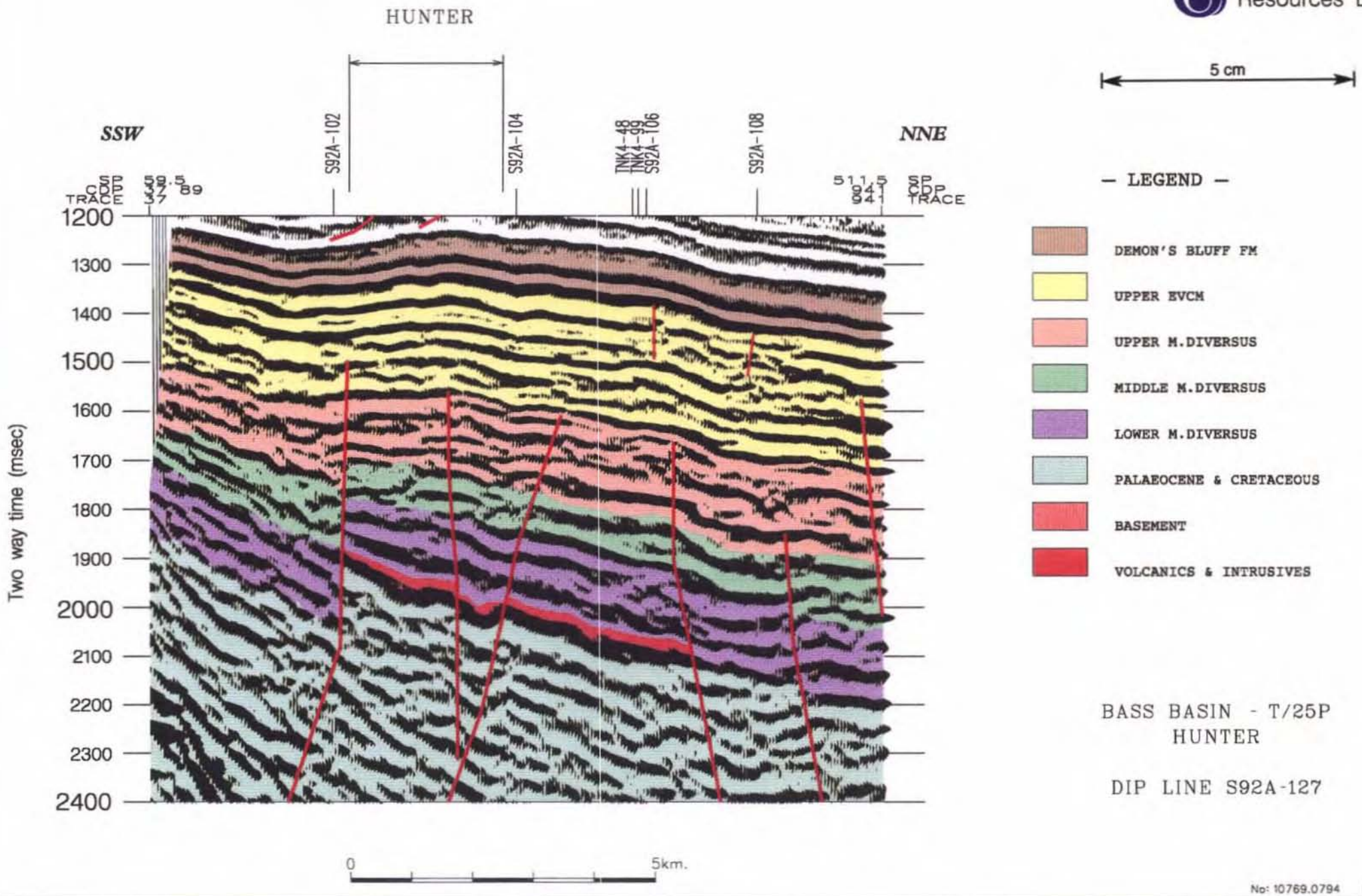


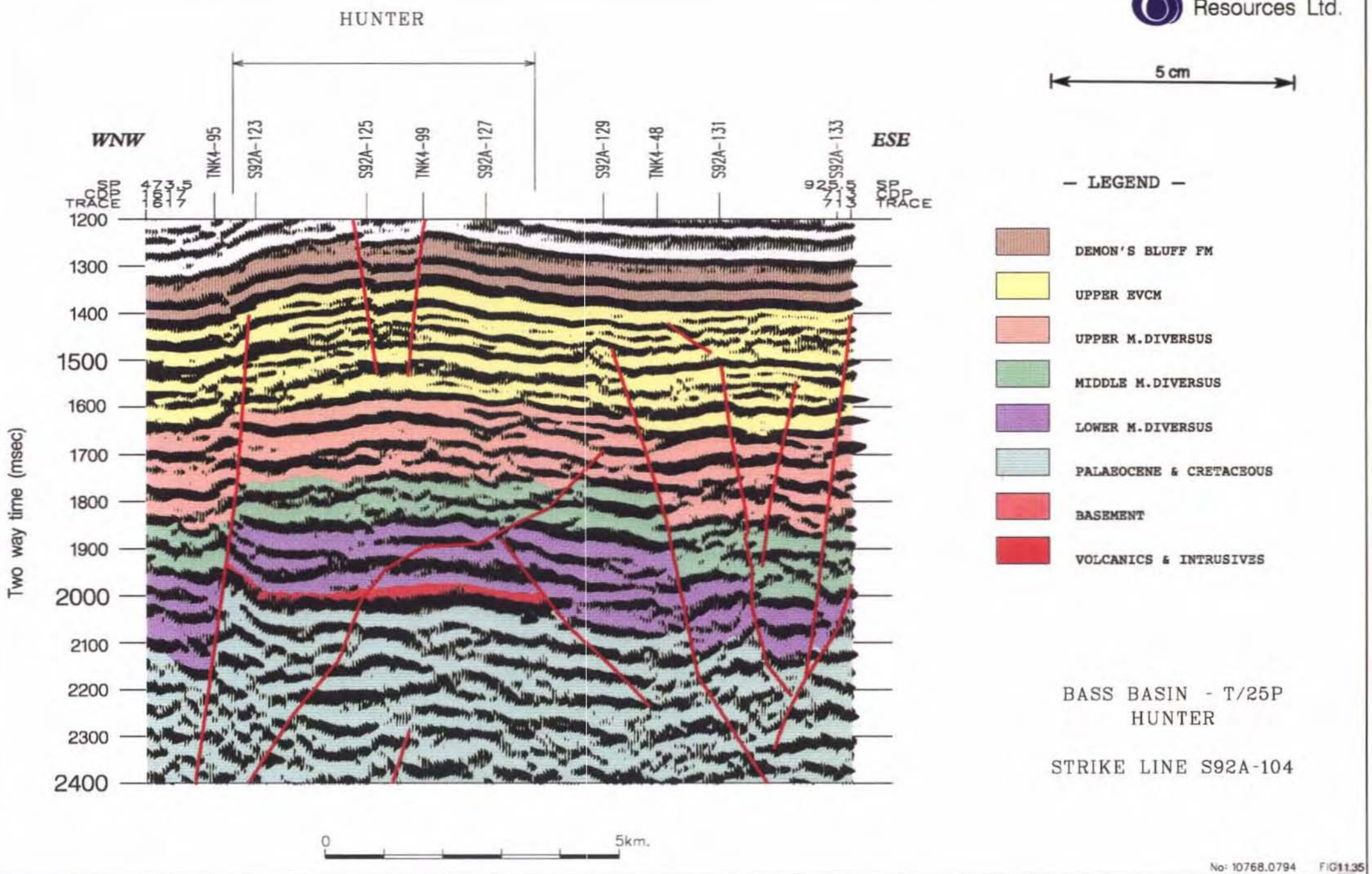
BASS BASIN - T/25P
HUNTER

DIP LINE S92A-127

No: 10769.0794 FIG 11.34

491250

SAGASCO Resources Ltd.



BASS BASIN - T/25P
HUNTER

STRIKE LINE S92A-104

No: 10768.0794 FIG11.35

PROSPECT DATA SHEET

LEAD G

CATEGORY	Lead		
LOCATION	Seismic line S92A-106 Sp 240 (middle *M.diversus*) Seismic line S92A-119 Sp 320 (Palaeocene)		
DESCRIPTION OF TRAP			
PRIMARY OBJECTIVES	EVCM -	Middle *M.diversus* Palaeocene	
MAXIMUM CLOSURE	EVCM -	Middle *M.diversus* Palaeocene	3.3 square kilometres
SECONDARY OBJECTIVES	None		
DEPTH TO TOP RESERVOIR	EVCM -	Middle *M.diversus* Palaeocene	mSS mSS

DESCRIPTION OF RISK ELEMENTS

SOURCE

Lead G is located on the Southwestern Ramp structural province and requires either long distance migration from the more mature areas of the Pelican Trough or vertical migration from the more deeply buried but more proximal source rock sequences below the lead. Source risk is therefore considered to be moderate to high for the middle *M.diversus* and moderate for the Palaeocene.

RESERVOIR

Regional porosity verses depth profiles predict that the average porosity at Lead G will be 25% at the middle *M.diversus*. The lead therefore carries a very low reservoir risk at the middle *M.diversus* and a low risk at the Palaeocene.

SEAL

Vertical sealing is dependent on intraformational top sealing shales with low risk and lateral fault seal. Overall sealing risk is moderate to high at the middle *M.diversus* and moderate at the Palaeocene.

STRUCTURE

The current seismic grid provides only a moderate level of confidence in the structural interpretation because of poor dip line coverage over the north western portion of the culmination.

The fault controlling Lead G is basement involved and is lower *M.diversus* aged but it continued growth during the rest of *M.diversus* time and into the "Upper" EVCM.

Structural risk is high at both objective levels.

ADDITIONAL WORK REQUIREMENTS

Lead G is small and the absence of any nearby similar plays means that a possible joint development option is unlikely. Therefore as the lead is unlikely to be large enough to sustain a commercial offshore development, no further work is required at Lead G.

491253

LEAD G - T/25P

EVCM Middle M diversus zone

RESERVES CALCULATION (Simple Slab Model)

	Depth (m)	Vertical Closure (m)	Area (sq km)	Bulk Rock Volume (cubic m)	Cum. OGIP (BCF)	Cum. Raw Gas (BCF)	Cum. Sales Gas (BCF)	Cum. Sales Gas (PJ)	Cum. Condensate (MMSTB)	Cum. OOIP (MMSTB)	Cum. REC. OIL (MMSTB)
1780	2250	10	0.19	5.70E+06	7.74	6.58	4.60	5.09	0.66	4.56	1.14
1790	2266.6	26.6	0.85	2.54E+07	34.45	29.28	20.50	22.65	2.93	20.31	5.08
1800	2283.3	43.3	1.84	5.52E+07	74.89	63.65	44.56	49.23	6.37	44.15	11.04
1810	2300	60	3.27	9.82E+07	133.32	113.32	79.33	87.64	11.33	78.60	19.65

RISKED SALES GAS (PJ)	2.24
RISKED REC OIL (MMSTB)	0.50

Input Parameters	
Net Pay (m)	30
Porosity	0.25
Sh	0.75
Bg	205
Boi	1.47
Condensate (BBL's/MMSCF)	100
Recovery factor (gas)	0.85
Recovery factor (oil)	0.25
Sales factor (gas)	0.7

RISK	%
SOURCE GAS	40%
SOURCE OIL	40%
SEAL	40%
RESERVOIR	80%
STRUCTURE	20%
CHANCE OF SUCCESS GAS	2.56%
CHANCE OF SUCCESS OIL	2.56%

24/05/94

LEADG.XLS

LEAD G - T/25P

EVCM Palaeocene

RESERVES CALCULATION (Simple Slab Model)

	Depth (m)	Vertical Closure (m)	Area (sq km)	Bulk Rock Volume (cubic m)	Cum. OGIP (BCF)	Cum. Raw Gas (BCF)	Cum. Sales Gas (BCF)	Cum. Sales Gas (PJ)	Cum. Condensate (MMSTB)	Cum. OOIP (MMSTB)	Cum. REC. OIL (MMSTB)
2020	2673.3	10	0.44	1.32E+07	17.88	15.19	10.64	11.75	1.52	9.94	2.48
2030	2690	26.73	0.98	2.93E+07	39.82	33.85	23.70	26.18	3.39	22.14	5.53
2040	2706.6	43.36	1.94	5.81E+07	78.79	66.98	46.88	51.80	6.70	43.80	10.95
2050	2724.6	61.28	2.64	7.92E+07	107.54	91.41	63.99	70.70	9.14	59.78	14.95

RISKED SALES GAS (PJ)	2.47
RISKED REC OIL (MMSTB)	0.31

Input Parameters	
Net Pay (m)	30
Porosity	0.25
Sh	0.75
Bg	205
Boi	1.56
Condensate (BBL's/MMSCF)	100
Recovery factor (gas)	0.85
Recovery factor (oil)	0.25
Sales factor (gas)	0.7

RISK	%
SOURCE GAS	50%
SOURCE OIL	30%
SEAL	50%
RESERVOIR	70%
STRUCTURE	20%
CHANCE OF SUCCESS GAS	3.50%
CHANCE OF SUCCESS OIL	2.10%

24/05/94

491255

SAGASCO Resources Ltd.

T /25P – LEAD G TOP PALAEOCENE

145° 45'

145° 50'

40° 25'

40° 30'

40° 35'

GRINDSTONE

EDDYSTONE

PELICAN 4

LEAD G

HUNTER

5 cm

0 Km 6

T /25P

No: 10736.0794 FIG. 11.36

491256

SAGASCO Resources Ltd.

145° 50'

40° 20'

40° 25'

PELICAN 3

PELICAN 2

PELICAN 1

PELICAN 5

PELICAN 4

TOURVILLE

WARREGO

ACTAEON

EDDYSTONE

GRINDSTONE

SURVILLE

HUNTER

LEAD G

T /25P – LEAD G
TOP MID *M.DIVERSUS*

5 cm

0 Km 6

No: 10860.0894 FIG.11.37

491257

PROSPECT DATA SHEET

NARIMBA WEST

CATEGORY	Weak Lead		
LOCATION	Seismic line TQH5-84 Sp 140		
DESCRIPTION OF TRAP	Small tilted fault block		
PRIMARY OBJECTIVES	EVCM -	Middle *M.diversus*	
MAXIMUM CLOSURE	EVCM -	Middle *M.diversus*	3.7 square kilometres
		Upper *M.diversus*	6.1 square kilometres
SECONDARY OBJECTIVES	EVCM -	Upper *M.diversus*	
DEPTH TO TOP RESERVOIR	EVCM -	Upper *M.diversus*	2233 mSS
		Middle *M.diversus*	2413 mSS

SUGGESTED TOTAL DEPTH

DESCRIPTION OF RISK ELEMENTS

SOURCE

Narimba West is located directly above the proven source kitchen for the gas and condensate reserves of the Pelican Field and is ideally located to receive charge from vertically migrating hydrocarbons. At Narimba West the middle *M.diversus* is early to middle mature for oil generation increasing to mid mature at the top Palaeocene and to the main gas to overmature generation phase at basement. Gas source risk is evaluated to be low for the middle *M.diversus* and high for the upper *M.diversus*. Oil source risk is ranked as moderate for the middle *M.diversus* and moderate to high at the upper *M.diversus*.

RESERVOIR

Reservoir development at Narimba West is predicted from regional porosity verses depth plots. At the upper *M.diversus* an average porosity of 25% is predicted declining to 23% at the middle *M.diversus*. Reservoir quality is therefore considered low to moderate risk at the upper *M.diversus* and moderate risk at the middle *M.diversus*.

SEAL

All closure is dependent on fault plane sealing. Top seals are anticipated to be intraformational.

Sealing risk at Narimba West is rated as moderate at the middle *M.diversus* and high at the upper *M.diversus*.

STRUCTURE

Structural closure is moderately defined by a regional seismic grid. The closure at Narimba is small and any development would be marginal unless significantly improved reservoir development were encountered, or if closure could be extended downdip. The current seismic grid suggests that some downdip closure might be added to the lead if further seismic control is made available. Structural development commenced in the middle *M.diversus* and has continued with fault movement through with reactivation into the Miocene carbonate sequence of the Torquay Group. Structural risk is rated as low to moderate.

ADDITIONAL WORK REQUIREMENTS

Narimba West was not addressed in the Rocky Cape Seismic Survey. Additional seismic data may increase the size of closure sufficient to make Narimba West an attractive drilling target.

491259

NARIMBAW.XLS

NARIMBA WEST - T/25P

EVCM Upper M diversus zone

RESERVES CALCULATION (Simple Slab Model)

	Depth (m)	Vertical Closure (m)	Area (sq km)	Bulk Rock Volume (cubic m)	Cum. OGIP (BCF)	Cum. Raw Gas (BCF)	Cum. Sales Gas (BCF)	Cum. Sales Gas (PJ)	Cum. Condensate (MMSTB)	Cum. OOIP (MMSTB)	Cum. REC. OIL (MMSTB)
1770	2233.3	10	0.72	2.15E+07	29.16	24.78	17.35	19.17	2.48	17.23	4.31
1780	2250	26.7	2.44	7.31E+07	99.16	84.28	59.00	65.18	8.43	58.59	14.65
1790	2266.7	43.4	6.11	1.83E+08	248.76	211.45	148.01	163.53	21.14	147.00	36.75

RISKED SALES GAS (PJ)	3.53
RISKED REC OIL (MMSTB)	1.06

Input Parameters	
Net Pay (m)	30
Porosity	0.25
Sh	0.75
Bg	205
Boi	1.47
Condensate (BBL's/MMSCF)	100
Recovery factor (gas)	0.85
Recovery factor (oil)	0.25
Sales factor (gas)	0.7

RISK	%
SOURCE	30%
SOURCE	40%
SEAL	20%
RESERVOIR	60%
STRUCTURE	60%
CHANCE OF SUCCESS GAS	2.16%
CHANCE OF SUCCESS OIL	2.88%

24/05/94

491260

NARIMBAW.XLS

NARIMBA WEST - T/25P

EVCM Middle M diversus zone

RESERVES CALCULATION (Simple Slab Model)

	Depth (m)	Vertical Closure (m)	Area (sq km)	Bulk Rock Volume (cubic m)	Cum. OGIP (BCF)	Cum. Raw Gas (BCF)	Cum. Sales Gas (BCF)	Cum. Sales Gas (PJ)	Cum. Condensate (MMSTB)	Cum. OOIP (MMSTB)	Cum. REC. OIL (MMSTB)
1880	2413.4	10	0.52	1.55E+07	20.03	17.03	11.92	13.17	1.70	11.16	2.79
1890	2430	26.6	1.83	5.48E+07	70.70	60.10	42.07	46.48	6.01	39.39	9.85
1900	2447.7	44.3	3.69	1.11E+08	142.80	121.38	84.97	93.87	12.14	79.55	19.89

RISKED SALES GAS (PJ)	9.86
RISKED REC OIL (MMSTB)	1.49

Input Parameters	
Net Pay (m)	30
Porosity	0.23
Sh	0.75
Bg	212
Boi	1.51
Condensate (BBL's/MMSCF)	100
Recovery factor (gas)	0.85
Recovery factor (oil)	0.25
Sales factor (gas)	0.7

RISK	%
SOURCE GAS	70%
SOURCE OIL	50%
SEAL	50%
RESERVOIR	50%
STRUCTURE	60%
CHANCE OF SUCCESS GAS	10.50%
CHANCE OF SUCCESS OIL	7.50%

24/05/94

491261

SAGASCO Resources Ltd.

T /25P – NARIMBA WEST WEAK LEAD TOP MID *M.DIVERSUS*

145° 40'

40° 10'

40° 20'

T /18P

T /25P

CAPE BARREN

PERON

ADAMSON

ROCHON

TOURVILLE

NARIMBA WEST

NARIMBA 1

ROCHON SOUTH

5 cm

0 Km 6

No: 10662.0794 FIG. 11.38

491262

SAGASCO Resources Ltd.

T /25P – NARIMBA WEST WEAK LEAD TOP UPPER *M.DIVERSUS*

145° 35'

145° 40'

40° 05'

40° 10'

40° 15'

CAPE BARREN

CLARKE

NARIMBA WEST

NARIMBA 1

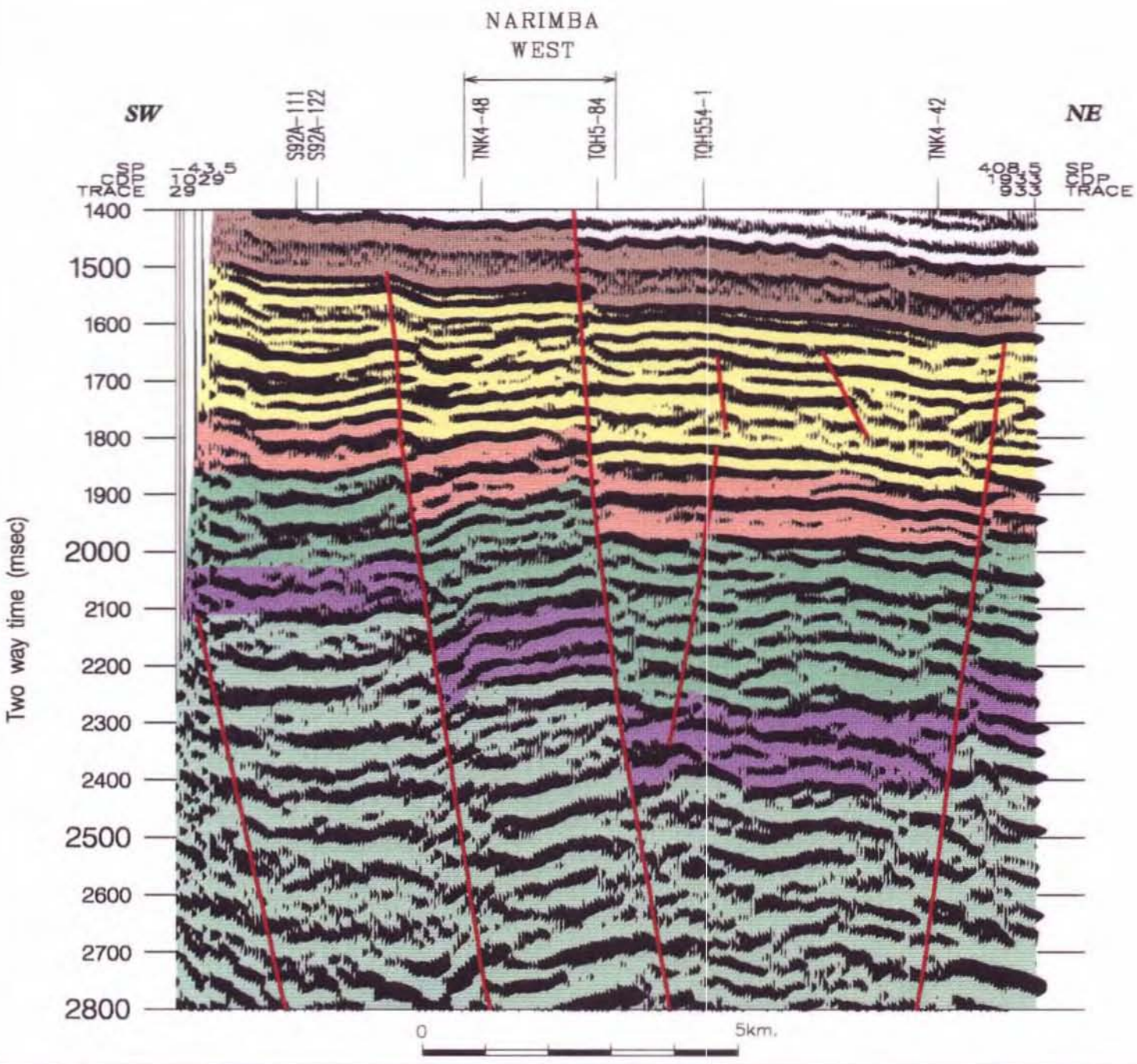
5 cm

0 Km 6

No: 10669.0794 FIG. 11.39

491263

SAGASCO Resources Ltd.



5 cm

— LEGEND —

- DEMON'S BLUFF FM
- UPPER EVCM
- UPPER M.DIVERSUS
- MIDDLE M.DIVERSUS
- LOWER M.DIVERSUS
- PALAEOCENE & CRETACEOUS
- BASEMENT
- VOLCANICS & INTRUSIVES

BASS BASIN - T/25P
NARIMBA WEST LEAD

DIP LINE TNK4-73

No:10767.0794 FIG. 11.40

PROSPECT DATA SHEET

PERKINS

CATEGORY	Lead
LOCATION	Seismic line TNK-65 Sp 290 (middle *M.diversus*)
DESCRIPTION OF TRAP	Tilted fault block with closure mapped against a northwest trending fault.
PRIMARY OBJECTIVES	EVCM - Middle *M.diversus*
MAXIMUM CLOSURE	EVCM - Middle *M.diversus* 15.3 square kilometres (twin closures are present, the northern one is completely in T/18P). A larger closure of 30.9 square kilometres including Cape Barren is possible.
SECONDARY OBJECTIVES	None
DEPTH TO TOP RESERVOIR	EVCM - middle *M.diversus* mSS

DESCRIPTION OF RISK ELEMENTS

SOURCE

Perkins is located adjacent to the proven source kitchen for the gas and condensate reserves of the Pelican Field and is ideally located to receive charge from vertically migrating hydrocarbons. At Perkins the middle *M.diversus* is early to middle mature for oil generation increasing to mid mature at the top Palaeocene and to late gas to overmature generation at basement. Gas source risk for Perkins is rated as low, whilst oil is rated as moderate risk.

RESERVOIR

Regional porosity verses depth gradients suggest that the middle *M.diversus* will have an average porosity of 22%. Reservoir risk is rated moderate.

SEAL

All closure is dependent on fault plane sealing. Top seals are anticipated to be intraformational. Sealing risk is moderate.

STRUCTURE

Structural closure is poorly defined by a regional seismic grid. Structural closure may have been formed by deep, possibly Miocene aged intrusives, similar to those near total depth at Tarook 1. Structural risk is moderate.

491265

ADDITIONAL WORK REQUIREMENTS

Perkins was not addressed in the Rocky Cape Seismic Survey. Additional seismic data is required to investigate the age of the structure and to determine the possible connection with the Cape Barren lead.

491266

PERKCB.XLS

PERKINS - T/25P

EVCM Middle M diversus zone

RESERVES CALCULATION (Simple Slab Model)

	Depth (m)	Vertical Closure (m)	Area (sq km)	Bulk Rock Volume (cubic m)	Cum. OGIP (BCF)	Cum. Raw Gas (BCF)	Cum. Sales Gas (BCF)	Cum. Sales Gas (PJ)	Cum. Condensate (MMSTB)	Cum. OOIP (MMSTB)	Cum. REC. OIL (MMSTB)
1920	2484.9	10	0.19	5.70E+06	7.04	5.98	4.19	4.63	0.60	3.88	0.97
1930	2505.8	30.9	4.08	1.22E+08	151.09	128.42	89.90	99.32	12.84	83.33	20.83
1940	2524.5	49.6	15.31	4.59E+08	567.21	482.13	337.49	372.86	48.21	312.85	78.21

RISKED SALES GAS (PJ)	39.15
RISKED REC OIL (MMSTB)	5.87

Input Parameters	
Net Pay (m)	30
Porosity	0.22
Sh	0.75
Bg	212
Boi	1.52
Condensate (BBL's/MMSCF)	100
Recovery factor (gas)	0.85
Recovery factor (oil)	0.25
Sales factor (gas)	0.7

RISK	%
SOURCE GAS	70%
SOURCE OIL	50%
SEAL	50%
RESERVOIR	60%
STRUCTURE	50%
CHANCE OF SUCCESS GAS	10.50%
CHANCE OF SUCCESS OIL	7.50%

24/05/94

491267

PERKCB.XLS

PERKINS - CAPE BARREN - T/25P

EVCM Middle M diversus zone

RESERVES CALCULATION (Simple Slab Model)

	Depth (m)	Vertical Closure (m)	Area (sq km)	Bulk Rock Volume (cubic m)	Cum. OGIP (BCF)	Cum. Raw Gas (BCF)	Cum. Sales Gas (BCF)	Cum. Sales Gas (PJ)	Cum. Condensate (MMSTB)	Cum. OOIP (MMSTB)	Cum. REC. OIL (MMSTB)
1920	2484.9	10	0.19	5.70E+06	7.04	5.98	4.19	4.63	0.60	3.88	0.97
1930	2505.8	30.9	4.08	1.22E+08	151.09	128.42	89.90	99.32	12.84	83.33	20.83
1940	2524.5	49.6	15.31	4.59E+08	567.21	482.13	337.49	372.86	48.21	312.85	78.21
1950	2542.7	67.8	30.92	9.28E+08	1145.83	973.96	681.77	753.23	97.40	631.99	158.00

RISKED SALES GAS (PJ)	63.27
RISKED REC OIL (MMSTB)	9.48

Input Parameters	
Net Pay (m)	30
Porosity	0.22
Sh	0.75
Bg	212
Boi	1.52
Condensate (BBL's/MMSCF)	100
Recovery factor (gas)	0.85
Recovery factor (oil)	0.25
Sales factor (gas)	0.7

RISK	%
SOURCE GAS	70%
SOURCE OIL	50%
SEAL	50%
RESERVOIR	60%
STRUCTURE	40%
CHANCE OF SUCCESS GAS	8.40%
CHANCE OF SUCCESS OIL	6.00%

24/05/94

491268

SAGASCO Resources Ltd.

T /25P – PERKINS LEAD TOP MID *M.DIVERSUS*

145° 35'

145° 40'

40° 05'

40° 10'

T /RL1

T /18P

T /25P

TAROOK 1

PERKINS

CLARKE

CLARKE

CAPE BARREN

PERON

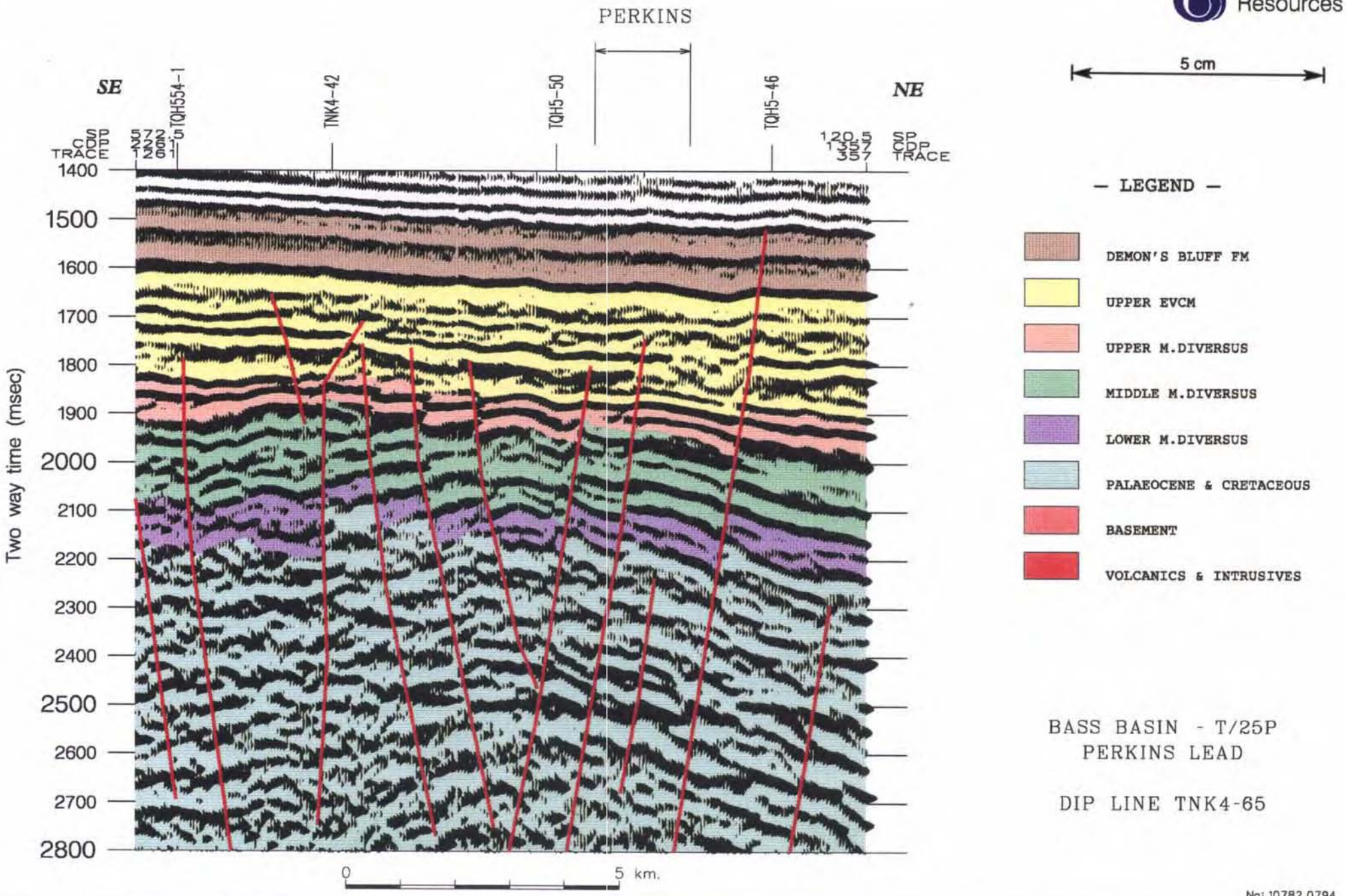
5 cm

0 Km 6

No: 10663.0794 FIG. 11.41

491269

SAGASCO Resources Ltd.



BASS BASIN - T/25P
PERKINS LEAD

DIP LINE TNK4-65

No: 10782.0794 FIG. 11.42

491270

PROSPECT DATA SHEET

PERON

CATEGORY	Lead			
LOCATION	Seismic line TQH5-61 Sp 670 (middle *M.diversus*) Seismic line TQH5-54-1 Sp 1295 (Palaeocene)			
DESCRIPTION OF TRAP	Anticlinal closure occurs at the middle *M.diversus* and twin tilted fault dependent closures mapped against a northwest trending fault occur at the Palaeocene.			
PRIMARY OBJECTIVES	EVCM	-	Middle *M.diversus*	
		-	Palaeocene	
MAXIMUM CLOSURE	EVCM	-	Middle *M.diversus*	4.6 square kilometres
			Palaeocene	1.6 and 6.9 square kilometres
SECONDARY OBJECTIVES	None			
DEPTH TO TOP RESERVOIR	EVCM	-	Middle *M.diversus*	2560 mSS
			Palaeocene	3086 and 3231 mSS

DESCRIPTION OF RISK ELEMENTS

SOURCE

Peron is located over the northwestern end of the proven source kitchen for the gas and condensate reserves of the Pelican Field and is ideally located to receive charge from vertically migrating hydrocarbons. At Peron the middle *M.diversus* is middle mature for oil generation increasing to mid-late mature at the top Palaeocene and to overmature at basement. Source risk for gas is evaluated as low whilst oil risk is moderate.

RESERVOIR

Average porosity in the middle *M.diversus* is predicted to be 22% declining to 14% in the Palaeocene. Reservoir development in the middle *M.diversus* is therefore considered to be moderate to high risk whilst because of depth of burial and the probability of poor permeability the Palaeocene at Peron is considered to be moderate to high to high risk.

SEAL

Intraformational top seals are required for the middle *M.diversus* trap. Whilst the Palaeocene requires sealing both by intraformational top seals and fault plane seals. Sealing is rated as moderate risk for the middle *M.diversus* and low to moderate risk for the Palaeocene.

491271

STRUCTURE

Structural closure is poorly defined by a sparse regional seismic grid which gives poor control for the important bounding fault. Consequently there is high risk that the closure could disappear with further data. One possibility is that the structure could simply open onto a relay ramp between en echelon faults.

ADDITIONAL WORK REQUIREMENTS

Peron was not addressed in the Rocky Cape Seismic Survey. Currently the structure is not considered large enough to warrant detailed seismic coverage but additional regional lines may assist in determining the viability of trap development at this location.

491272

PERON.XLS

PERON - T/25P

EVCM Middle M diversus zone

RESERVES CALCULATION (Simple Slab Model)

	Depth (m)	Vertical Closure (m)	Area (sq km)	Bulk Rock Volume (cubic m)	Cum. OGIP (BCF)	Cum. Raw Gas (BCF)	Cum. Sales Gas (BCF)	Cum. Sales Gas (PJ)	Cum. Condensate (MMSTB)	Cum. OOIP (MMSTB)	Cum. REC. OIL (MMSTB)
1960	2559.9	10	2.36	7.09E+07	90.05	76.54	53.58	59.19	7.65	47.80	11.95
1970	2576.6	26.7	4.62	1.39E+08	176.05	149.65	104.75	115.73	14.96	93.46	23.37

RISKED SALES GAS (PJ)	4.86
RISKED REC OIL (MMSTB)	0.70

Input Parameters	
Net Pay (m)	30
Porosity	0.22
Sh	0.75
Bg	218
Boi	1.54
Condensate (BBL's/MMSCF)	100
Recovery factor (gas)	0.85
Recovery factor (oil)	0.25
Sales factor (gas)	0.7

RISK	%
SOURCE GAS	70%
SOURCE OIL	50%
SEAL	50%
RESERVOIR	40%
STRUCTURE	30%
CHANCE OF SUCCESS GAS	4.20%
CHANCE OF SUCCESS OIL	3.00%

24/05/94

491273

PERON.XLS

PERON EAST - T/25P

EVCM Palaeocene

RESERVES CALCULATION (Simple Slab Model)

	Depth (m)	Vertical Closure (m)	Area (sq km)	Bulk Rock Volume (cubic m)	Cum. OGIP (BCF)	Cum. Raw Gas (BCF)	Cum. Sales Gas (BCF)	Cum. Sales Gas (PJ)	Cum. Condensate (MMSTB)	Cum. OOIP (MMSTB)	Cum. REC. OIL (MMSTB)
2320	3231.3	10	0.08	2.49E+06	2.14	1.82	1.27	1.41	0.18	0.98	0.24
2330	3250	28.7	0.30	8.85E+06	7.61	6.47	4.53	5.00	0.65	3.48	0.87
2340	3268.2	46.9	0.76	2.29E+07	19.72	16.76	11.73	12.96	1.68	9.01	2.25
2350	3286.3	65	1.62	4.85E+07	41.76	35.49	24.84	27.45	3.55	19.08	4.77

RISKED SALES GAS (PJ)	0.69
RISKED REC OIL (MMSTB)	0.09

Input Parameters	
Net Pay (m)	30
Porosity	0.14
Sh	0.75
Bg	232
Boi	1.68
Condensate (BBL's/MMSCF)	100
Recovery factor (gas)	0.85
Recovery factor (oil)	0.25
Sales factor (gas)	0.7

RISK	%
SOURCE GAS	70%
SOURCE OIL	50%
SEAL	60%
RESERVOIR	20%
STRUCTURE	30%
CHANCE OF SUCCESS GAS	2.52%
CHANCE OF SUCCESS OIL	1.80%

24/05/94

491274

PERON.XLS

PERON WEST - T/25P

EVCM Palaeocene

RESERVES CALCULATION (Simple Slab Model)

	Depth (m)	Vertical Closure (m)	Area (sq km)	Bulk Rock Volume (cubic m)	Cum. OGIP (BCF)	Cum. Raw Gas (BCF)	Cum. Sales Gas (BCF)	Cum. Sales Gas (PJ)	Cum. Condensate (MMSTB)	Cum. OOIP (MMSTB)	Cum. REC. OIL (MMSTB)
2240	3086.1	10	0.01	3.90E+05	0.38	0.32	0.23	0.25	0.03	0.18	0.04
2250	3106.1	30	0.14	4.23E+06	4.10	3.49	2.44	2.70	0.35	1.94	0.48
2260	3124.6	48.5	0.40	1.20E+07	11.62	9.87	6.91	7.64	0.99	5.48	1.37
2270	3142.7	66.6	0.63	1.89E+07	18.37	15.61	10.93	12.08	1.56	8.66	2.17
2280	3160	83.9	0.99	2.98E+07	28.91	24.57	17.20	19.00	2.46	13.63	3.41
2290	3176.7	100.6	1.33	3.99E+07	38.69	32.89	23.02	25.43	3.29	18.24	4.56
2300	3193.8	117.7	2.09	6.27E+07	60.82	51.69	36.19	39.98	5.17	28.67	7.17
2310	3212.5	136.4	3.64	1.09E+08	105.82	89.95	62.96	69.56	8.99	49.89	12.47
2320	3231.3	155.2	6.06	1.82E+08	176.54	150.06	105.04	116.05	15.01	83.23	20.81
2330	3250	173.9	6.61	1.98E+08	192.40	163.54	114.48	126.48	16.35	90.71	22.68
2340	3268.2	192.1	6.86	2.06E+08	199.71	169.75	118.83	131.28	16.98	94.15	23.54

RISKED SALES GAS (PJ)	4.96
RISKED REC OIL (MMSTB)	0.64

Input Parameters	
Net Pay (m)	30
Porosity	0.16
Sh	0.75
Bg	229
Boi	1.65
Condensate (BBL's/MMSCF)	100
Recovery factor (gas)	0.85
Recovery factor (oil)	0.25
Sales factor (gas)	0.7

RISK	%
SOURCE GAS	70%
SOURCE OIL	50%
SEAL	60%
RESERVOIR	30%
STRUCTURE	30%
CHANCE OF SUCCESS GAS	3.78%
CHANCE OF SUCCESS OIL	2.70%

24/05/94

491275

SAGASCO Resources Ltd.

T/25P – PERON LEAD TOP PALAEOCENE

145° 35'

145° 40'

40° 10'

40° 15'

RAOUL

PERON

ADAMSON

ROCHON

NARIMBA 1

5 cm

0 Km 6

No: 10681.0794 FIG.11.43

491276

SAGASCO Resources Ltd.

T /25P – PERON LEAD TOP MID *M.DIVERSUS*

145° 40'

40° 10'

40° 15'

40° 20'

T /18P

T /25P

CAPE BARREN

PERON

ADAMSON

ROCHON

NARIMBA WEST

TOURVILLE

NARIMBA 1

ROCHON SOUTH

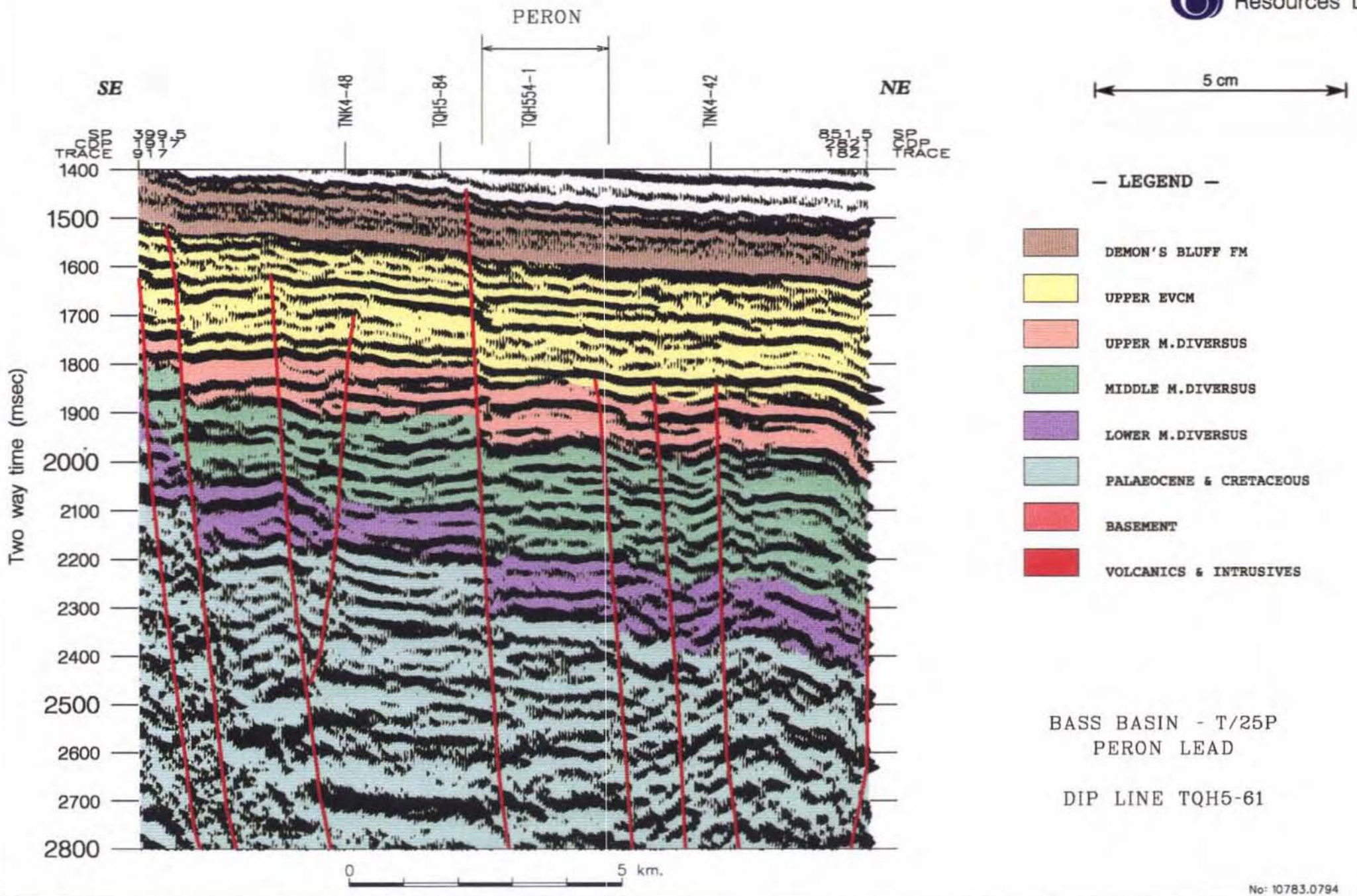
5 cm

0 Km 6

No: 10691.0794 FIG. 11.44

491277

SAGASCO Resources Ltd.



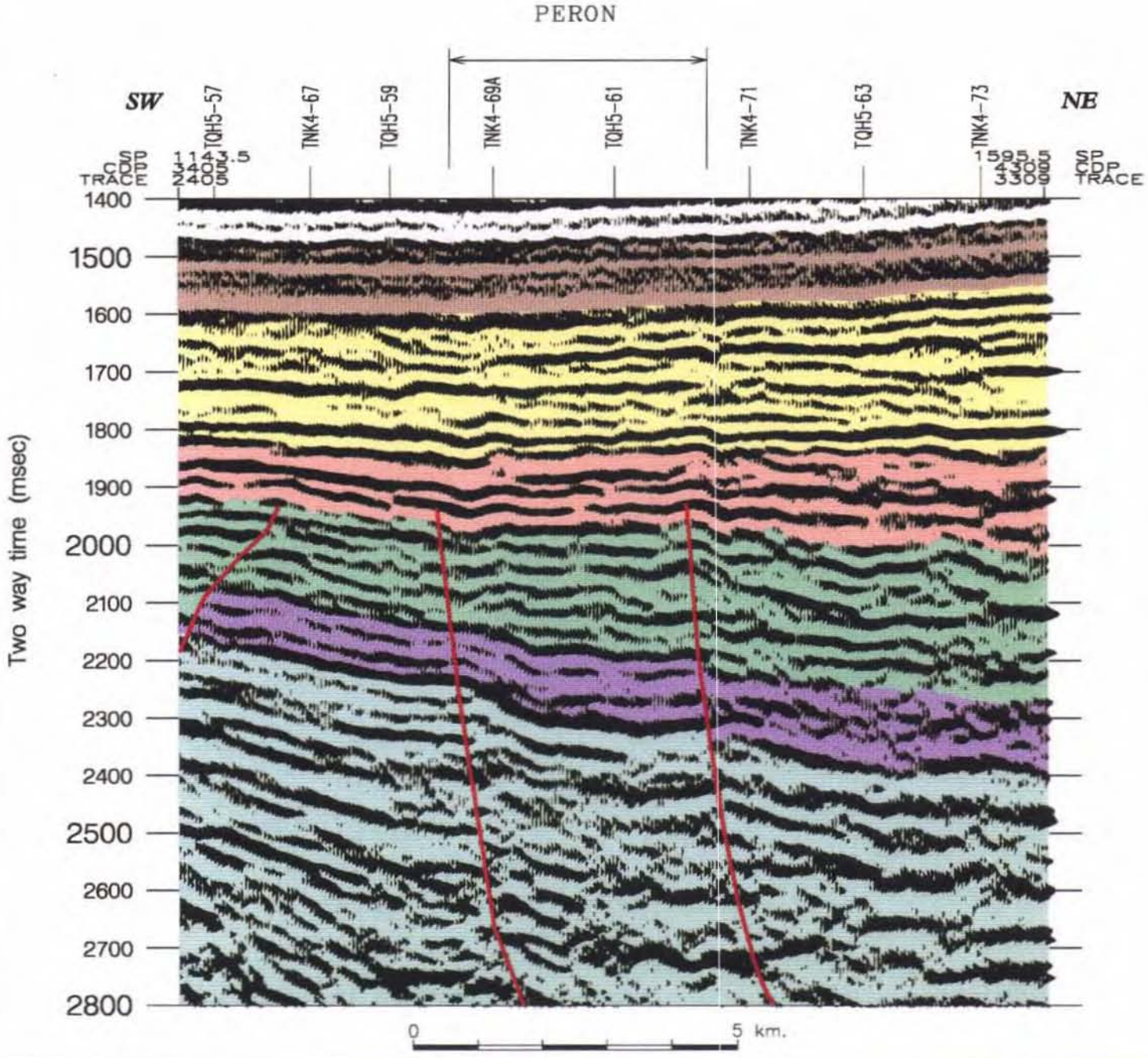
BASS BASIN - T/25P
PERON LEAD

DIP LINE TQH5-61

No: 10783.0794 FIG.11.45

491278

SAGASCO Resources Ltd.



5 cm

— LEGEND —

- DEMON'S BLUFF FM
- UPPER EVCM
- UPPER M.DIVERSUS
- MIDDLE M.DIVERSUS
- LOWER M.DIVERSUS
- PALAEOCENE & CRETACEOUS
- BASEMENT
- VOLCANICS & INTRUSIVES

BASS BASIN - T/25P
PERON LEAD

STRIKE LINE TQH554-1

No: 10784.0794 FIG.11.46

491279

PROSPECT DATA SHEET

POONBOON NORTH

CATEGORY	Weak lead			
LOCATION	Seismic line TQH5-97 Sp 230 (middle *M.diversus*)			
DESCRIPTION OF TRAP	Low relief anticline			
PRIMARY OBJECTIVES	EVCM	-	Middle *M.diversus*	
MAXIMUM CLOSURE	EVCM	-	Middle *M.diversus*	10.5 square kilometres
SECONDARY OBJECTIVES	None			
DEPTH TO TOP RESERVOIR	EVCM	-	Middle *M.diversus*	2525 mSS

DESCRIPTION OF RISK ELEMENTS

SOURCE

Poonboon North is located on the Poonboon Platform and is dependent on the so far unproven source potential of this structural province. However maturity modelling predicts that at the middle *M.diversus* and Palaeocene the sequence will be mid-mature for oil generation grading to the gas mature at basement. Vertical migration of hydrocarbons from source rocks below the lead is considered to be high risk as there is relatively little faulting associated with the structure to provide migration conduits to potential reservoirs. Gas charge to the lead is ranked as high risk whilst oil charge is more likely with moderate risk.

RESERVOIR

Reservoir development on the Poonboon Platform is predicted to be better than that in the Pelican Trough. Regional porosity gradients from the Pelican Trough predict that the middle *M.diversus* will have an average porosity of 22%. For the reasons described above this should be considered a low estimate. Reservoir risk at Poonboon North is therefore considered to be low.

SEAL

The structure is dependent on well developed intraformational top sealing units in the middle *M.diversus*. Sealing risk is ranked as low.

STRUCTURE

Structural closure is based on a broad regional seismic grid with 3-4 km spacing between lines. The Poonboon North structure is an old structure with prominent rollover at the Early Cretaceous. Structural risk is high, but may decrease if additional data is recorded over the lead.

ADDITIONAL WORK REQUIREMENTS

Poonboon North was not addressed in the Rocky Cape Seismic Survey. Reprocessing of existing seismic data over Poonboon North may assist in further defining closure. However there will still remains a need for additional new seismic data over the structure.

491281

POONBOON.XLS

POONBOON NORTH - T/25P

EVCM Middle M diversus zone

RESERVES CALCULATION (Simple Slab Model)

	Depth (m)	Vertical Closure (m)	Area (sq km)	Bulk Rock Volume (cubic m)	Cum. OGIP (BCF)	Cum. Raw Gas (BCF)	Cum. Sales Gas (BCF)	Cum. Sales Gas (PJ)	Cum. Condensate (MMSTB)	Cum. OOIP (MMSTB)	Cum. REC. OIL (MMSTB)
1940	2524.5	10	1.22	3.66E+07	45.85	38.97	27.28	30.14	3.90	24.80	6.20
1950	2542.3	27.8	10.50	3.15E+08	394.50	335.33	234.73	259.33	33.53	213.38	53.35

RISKED SALES GAS (PJ)	11.44
RISKED REC OIL (MMSTB)	3.92

Input Parameters	
Net Pay (m)	30
Porosity	0.22
Sh	0.75
Bg	215
Boi	1.53
Condensate (BBL's/MMSCF)	100
Recovery factor (gas)	0.85
Recovery factor (oil)	0.25
Sales factor (gas)	0.7

RISK	%
SOURCE GAS	30%
SOURCE OIL	50%
SEAL	70%
RESERVOIR	70%
STRUCTURE	30%
CHANCE OF SUCCESS GAS	4.41%
CHANCE OF SUCCESS OIL	7.35%

24/05/94

491282

SAGASCO Resources Ltd.

T/25P – POONBOON NORTH LEAD TOP MID *M.DIVERSUS*

NANGKERO

40°05'

T/25P

1990

POONBOON NORTH

POONBOON 1

T/18P

5 cm

45°10'

0 Km 6

145°50'

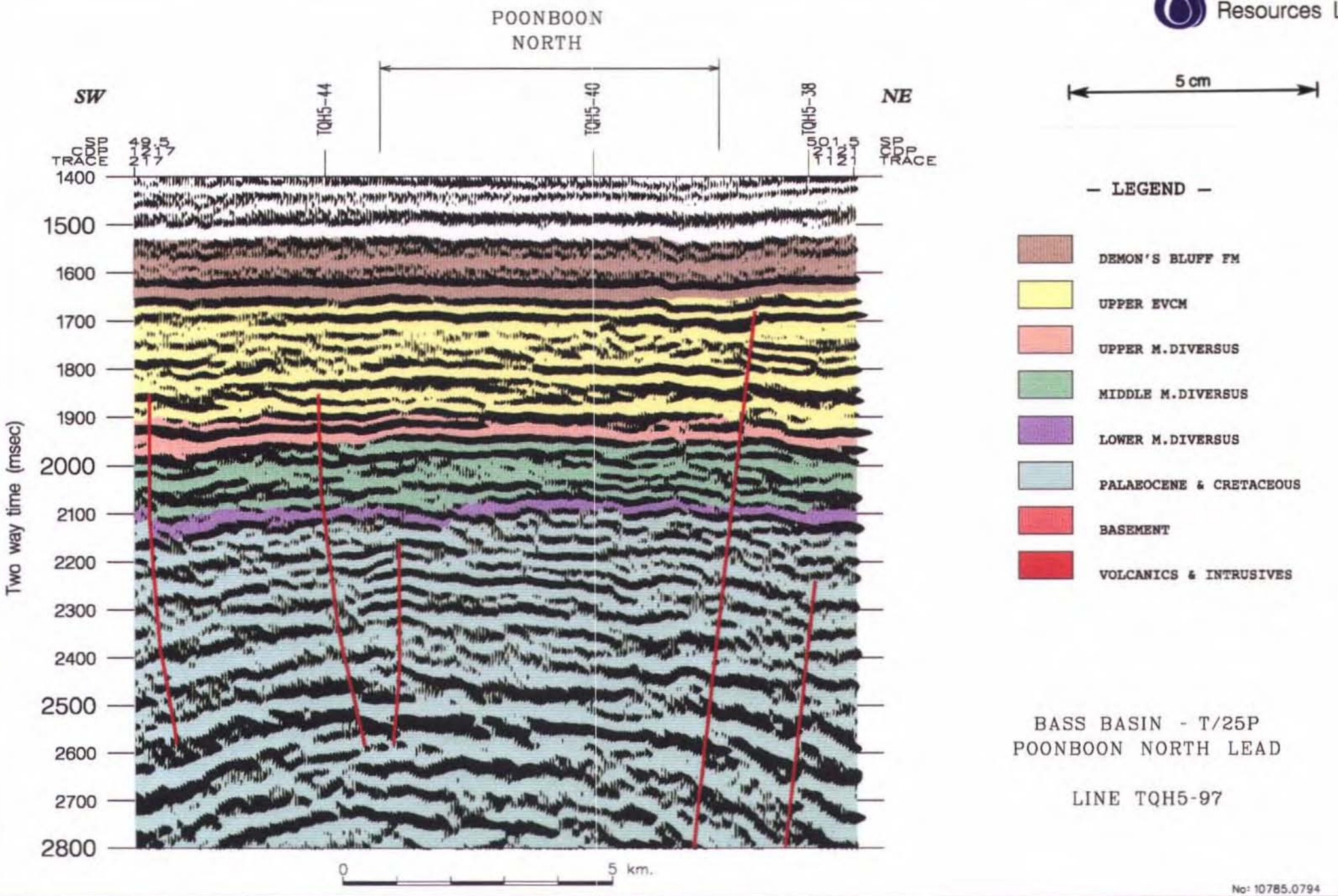
145°55'

146°00'

No: 10859.0894 Fig.11.47

491283

SAGASCO Resources Ltd.



BASS BASIN - T/25P
POONBOON NORTH LEAD

LINE TQH5-97

No: 10785.0794 FIG 11.48

491284

PROSPECT DATA SHEET

RAOUL

CATEGORY	Lead			
LOCATION	Seismic line TNK4-61 Sp 250 (Palaeocene)			
DESCRIPTION OF TRAP	Horst block downthrown to the southwest and northeast.			
PRIMARY OBJECTIVES	EVCM	-	Palaeocene	
MAXIMUM CLOSURE	EVCM	-	Palaeocene	3.8 and 4.2 square kilometres
SECONDARY OBJECTIVES	None			
DEPTH TO TOP RESERVOIR	EVCM	-	Palaeocene	2836 and 2724 mSS

DESCRIPTION OF RISK ELEMENTS

SOURCE

Raoul is located at the northern end of the Pelican Trough which has proven gas and condensate generating potential. Maturity modelling predicts that at the middle *M.diversus* the sequence will be early mature for oil generation grading to mid-mature in the Palaeocene and overmature at basement.

The lead is dependent on either vertical migration up fault conduits or from possible migration from mature source rocks on the strike oriented flanks of the structure. Raoul therefore has a low risk for gas charge and a moderate risk for oil charge.

RESERVOIR

The Palaeocene is predicted to have an average porosity of 18% and therefore the risk of encountering tight or low permeability reservoirs is estimated to be high.

SEAL

The structure is relatively small and compartmentalised and therefore carries low to moderate risk.

STRUCTURE

Structural closure is based on a broad regional seismic grid. Growth occurred on the bounding fault to Raoul through to near the top of the EVCM. A possible igneous intrusion in the Palaeocene adds further risk to Raoul. Structural risk is ranked as moderate.

491285

ADDITIONAL WORK REQUIREMENTS

Raoul was not addressed in the Rocky Cape Seismic Survey. The relatively small size of Raoul means that further seismic data is not justified at this stage.

491286

RAOULW.XLS

RAOUL WEST - T/25P

EVCM Palaeocene

RESERVES CALCULATION (Simple Slab Model)

	Depth (m)	Vertical Closure (m)	Area (sq km)	Bulk Rock Volume (cubic m)	Cum. OGIP (BCF)	Cum. Raw Gas (BCF)	Cum. Sales Gas (BCF)	Cum. Sales Gas (PJ)	Cum. Condensate (MMSTB)	Cum. OOIP (MMSTB)	Cum. REC. OIL (MMSTB)
2050	2724.6	10	0.02	6.00E+05	0.70	0.59	0.42	0.46	0.06	0.36	0.09
2060	2742.7	28.1	0.21	6.21E+06	7.24	6.15	4.31	4.76	0.62	3.72	0.93
2070	2759.5	44.9	0.42	1.25E+07	14.58	12.39	8.67	9.58	1.24	7.50	1.87
2080	2775.3	60.7	2.32	6.96E+07	81.14	68.97	48.28	53.34	6.90	41.74	10.44
2090	2791.1	76.5	4.18	1.26E+08	146.27	124.33	87.03	96.16	12.43	75.25	18.81

RISKED SALES GAS (PJ)	6.06
RISKED REC OIL (MMSTB)	0.85

Input Parameters	
Net Pay (m)	30
Porosity	0.2
Sh	0.75
Bg	220
Boi	1.57
Condensate (BBL's/MMSCF)	100
Recovery factor (gas)	0.85
Recovery factor (oil)	0.25
Sales factor (gas)	0.7

RISK	%
SOURCE GAS	70%
SOURCE OIL	50%
SEAL	60%
RESERVOIR	30%
STRUCTURE	50%
CHANCE OF SUCCESS GAS	6.30%
CHANCE OF SUCCESS OIL	4.50%

24/05/94

491287

RAOULE.XLS

RAOUL EAST - T/25P

EVCM Palaeocene

RESERVES CALCULATION (Simple Slab Model)

	Depth (m)	Vertical Closure (m)	Area (sq km)	Bulk Rock Volume (cubic m)	Cum. OGIP (BCF)	Cum. Raw Gas (BCF)	Cum. Sales Gas (BCF)	Cum. Sales Gas (PJ)	Cum. Condensate (MMSTB)	Cum. OOIP (MMSTB)	Cum. REC. OIL (MMSTB)
2110	2836.6	10	0.15	4.59E+06	4.88	4.15	2.90	3.21	0.41	2.44	0.61
2120	2863.3	36.7	1.83	5.49E+07	58.33	49.58	34.71	38.35	4.96	29.17	7.29
2130	2885.6	59	3.79	1.14E+08	120.72	102.61	71.83	79.35	10.26	60.36	15.09

RISKED SALES GAS (PJ)	5.00
RISKED REC OIL (MMSTB)	0.68

Input Parameters	
Net Pay (m)	30
Porosity	0.18
Sh	0.75
Bg	223
Boi	1.60
Condensate (BBL's/MMSCF)	100
Recovery factor (gas)	0.85
Recovery factor (oil)	0.25
Sales factor (gas)	0.7

RISK	%
SOURCE GAS	70%
SOURCE OIL	50%
SEAL	60%
RESERVOIR	30%
STRUCTURE	50%
CHANCE OF SUCCESS GAS	6.30%
CHANCE OF SUCCESS OIL	4.50%

24/05/94

491288

SAGASCO Resources Ltd.

T/25P – RAOUL LEAD TOP PALAEOCENE

145° 30'

140° 35'

40° 05'

40° 10'

TAROOK 1

RAOUL

CLARKE

PERON

ROCHON

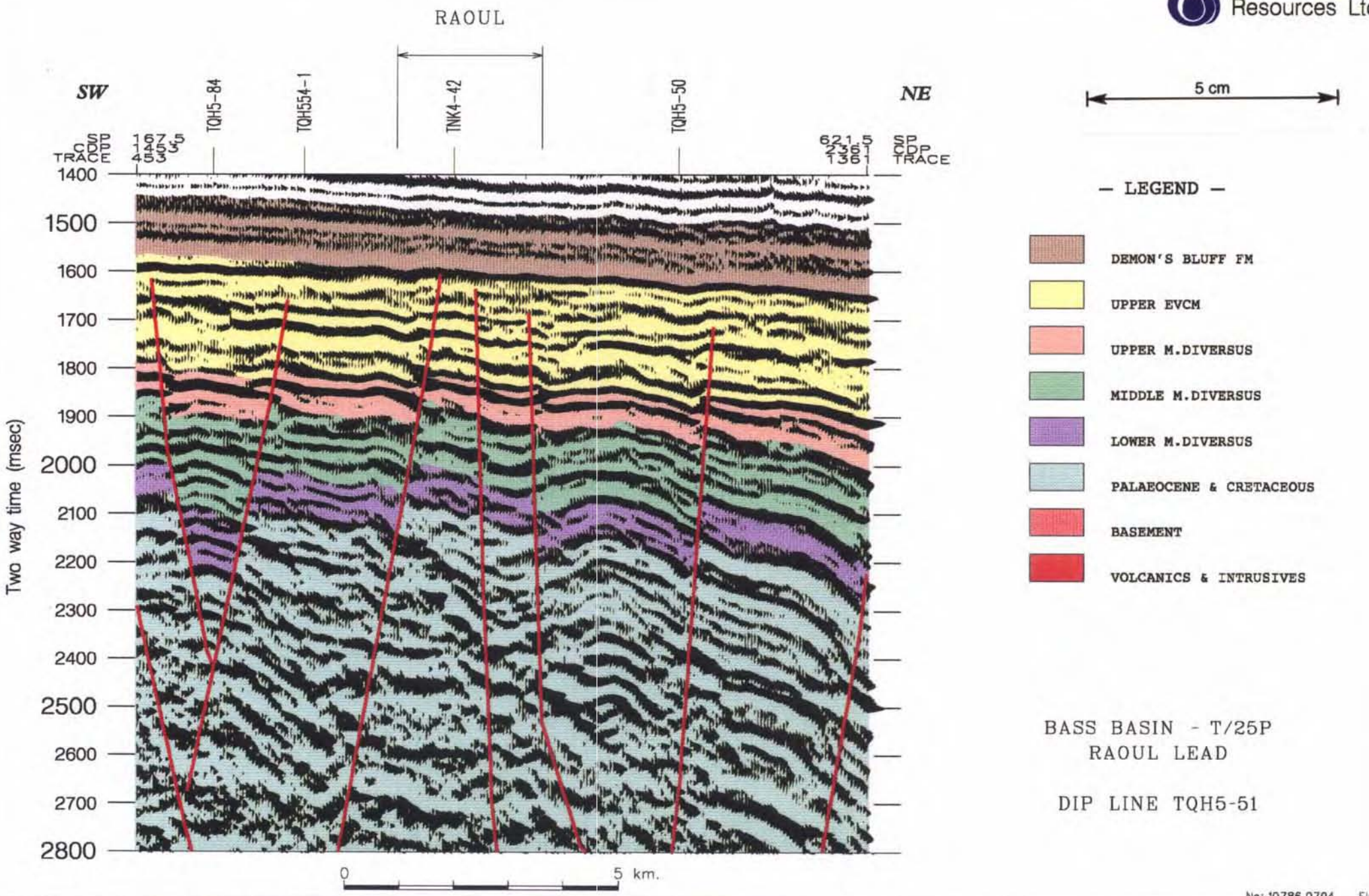
5 cm

0 Km 6

No: 10682.0794 FIG. 11.49

491289

SAGASCO Resources Ltd.



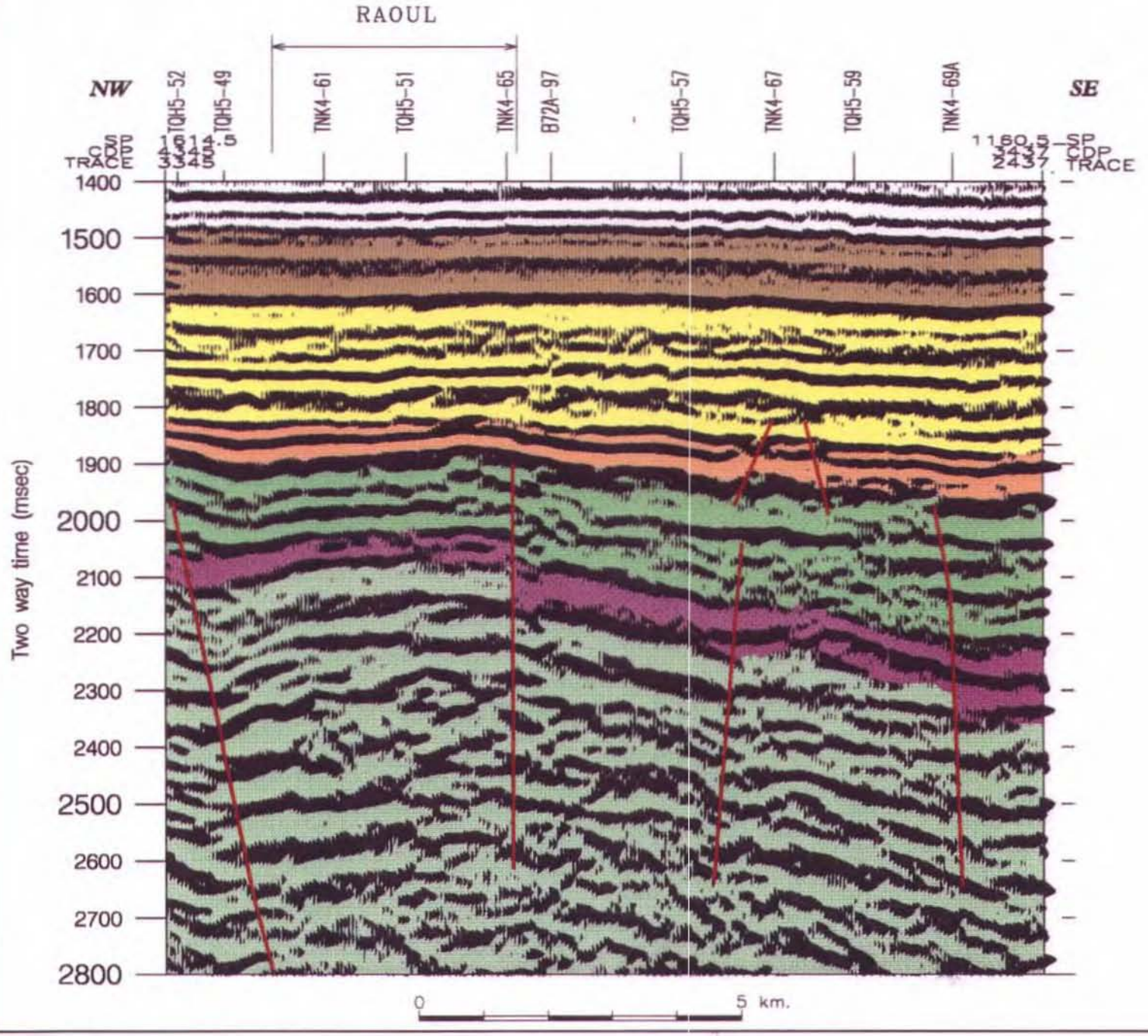
BASS BASIN - T/25P
RAOUL LEAD

DIP LINE TQH5-51

No: 10786.0794 FIG.11.50

491290

SAGASCO Resources Ltd.



5 cm

— LEGEND —

- DEMON'S BLUFF FM
- UPPER EVCM
- UPPER M.DIVERSUS
- MIDDLE M.DIVERSUS
- LOWER M.DIVERSUS
- PALAEOCENE & CRETACEOUS
- BASEMENT
- VOLCANICS * INTRUSIVES

BASS BASIN - T/25P
RAOUL LEAD

STRIKE LINE TNK4-42

No: 10823.0794 FIG. 11.51

491291

PROSPECT DATA SHEET

ROCHON

CATEGORY	Lead		
LOCATION	Seismic line TQH5-61 Sp 460 (middle *M.diversus*) Seismic line TQH5-59 Sp 990 (Palaeocene)		
DESCRIPTION OF TRAP	Low-side fault closure		
PRIMARY OBJECTIVES	EVCM - Middle *M.diversus* - Palaeocene		
MAXIMUM CLOSURE	EVCM - Middle *M.diversus* Palaeocene		4.6 square kilometres 10.7 square kilometres
SECONDARY OBJECTIVES	None		
DEPTH TO TOP RESERVOIR	EVCM - Middle *M.diversus* Palaeocene		2413 mSS 2791 mSS

DESCRIPTION OF RISK ELEMENTS

SOURCE

Rochon is located at the northwestern end of the Pelican Trough which has proven gas and condensate generating potential. Maturity modelling predicts that at the middle *M.diversus* the sequence will be early mature for oil generation grading to mid-mature in Palaeocene and in the late gas mature window at basement. Migration from along strike and downdip mature source sequences to the northwest and southeast of the lead is possible as is vertical migration up fault conduits. Source risk for gas is ranked as low whilst oil risk is moderate.

RESERVOIR

The middle *M.diversus* reservoirs at Rochon are predicted to have average porosities of 23% declining to 19% in the Palaeocene. The lead shares many of the same uncertainties with respect to reservoir development as the Clarke lead, such that there could be a significant improvement in the quality and amount of reservoir to that used in the reserve calculations attached here. Reservoir risk is estimated to be moderate for the middle *M.diversus* and high for the Palaeocene.

491292

SEAL

Rochon is dependent on the development of intraformational top seals and cross fault or fault plane seals. Cross fault juxtaposition is such that potential reservoirs in the middle *M.diversus* are juxtaposed against Palaeocene and lower *M.diversus* (often very shaly sequences) and the Palaeocene at the lead is juxtaposed against the Early Cretaceous. Sealing risk is rated as moderate for the middle *M.diversus* and low to moderate for the Palaeocene.

STRUCTURE

Structural closure is based on regionally spaced dip lines. There is no control in the strike orientation over the lead. Movement along the bounding fault at Rochon continued into the upper part of the EVCM. Structural risk is high.

ADDITIONAL WORK REQUIREMENTS

Rochon was not addressed in the Rocky Cape Seismic Survey.

491293

ROCHON.XLS

ROCHON - T/25P

EVCM Middle M diversus zone

RESERVES CALCULATION (Simple Slab Model)

	Depth (m)	Vertical Closure (m)	Area (sq km)	Bulk Rock Volume (cubic m)	Cum. OGIP (BCF)	Cum. Raw Gas (BCF)	Cum. Sales Gas (BCF)	Cum. Sales Gas (PJ)	Cum. Condensate (MMSTB)	Cum. OOIP (MMSTB)	Cum. REC. OIL (MMSTB)
1880	2413.4	10	2.36	7.09E+07	91.55	77.82	54.47	60.18	7.78	51.00	12.75
1890	2430.1	26.7	4.62	1.39E+08	178.99	152.14	106.50	117.66	15.21	99.71	24.93

RISKED SALES GAS (PJ)	6.18
RISKED REC OIL (MMSTB)	0.93

Input Parameters	
Net Pay (m)	30
Porosity	0.23
Sh	0.75
Bg	212
Boi	1.51
Condensate (BBL's/MMSCF)	100
Recovery factor (gas)	0.85
Recovery factor (oil)	0.25
Sales factor (gas)	0.7

RISK	%
SOURCE GAS	70%
SOURCE OIL	50%
SEAL	50%
RESERVOIR	50%
STRUCTURE	30%
CHANCE OF SUCCESS GAS	5.25%
CHANCE OF SUCCESS OIL	3.75%

24/05/94

491294

ROCHON.XLS

ROCHON - T/25P

EVCM Palaeocene

RESERVES CALCULATION (Simple Slab Model)

	Depth (m)	Vertical Closure (m)	Area (sq km)	Bulk Rock Volume (cubic m)	Cum. OGIP (BCF)	Cum. Raw Gas (BCF)	Cum. Sales Gas (BCF)	Cum. Sales Gas (PJ)	Cum. Condensate (MMSTB)	Cum. OOIP (MMSTB)	Cum. REC. OIL (MMSTB)
2090	2791.1	10	0.73	2.19E+07	26.49	22.51	15.76	17.41	2.25	12.38	3.09
2100	2806.9	25.8	1.63	4.89E+07	59.06	50.20	35.14	38.82	5.02	27.60	6.90
2110	2836.6	55.5	2.99	8.96E+07	108.19	91.96	64.37	71.12	9.20	50.57	12.64
2120	2863.3	82.2	4.23	1.27E+08	153.26	130.27	91.19	100.75	13.03	71.64	17.91
2130	2885.6	104.5	5.68	1.70E+08	205.65	174.80	122.36	135.19	17.48	96.13	24.03
2140	2902.3	121.2	7.40	2.22E+08	268.11	227.90	159.53	176.25	22.79	125.32	31.33
2150	2917.7	136.6	9.25	2.78E+08	335.29	284.99	199.50	220.41	28.50	156.72	39.18
2160	2933.8	152.7	10.65	3.19E+08	385.83	327.96	229.57	253.63	32.80	180.35	45.09

RISKED SALES GAS (PJ)	9.59
RISKED REC OIL (MMSTB)	1.22

Input Parameters	
Net Pay (m)	30
Porosity	0.19
Sh	0.75
Bg	240
Boi	1.59
Condensate (BBL's/MMSCF)	100
Recovery factor (gas)	0.85
Recovery factor (oil)	0.25
Sales factor (gas)	0.7

RISK	%
SOURCE GAS	70%
SOURCE OIL	50%
SEAL	60%
RESERVOIR	30%
STRUCTURE	30%
CHANCE OF SUCCESS GAS	3.78%
CHANCE OF SUCCESS OIL	2.70%

24/05/94

491295

SAGASCO Resources Ltd.

T/25P – ROCHON LEAD TOP PALAEOCENE

145° 35'

40° 10'

40° 15'

RAOUL

CLARKE

PERON

ROCHON

5 cm

0 Km 6

No: 10683.0794 FIG. 11.52

491296

SAGASCO Resources Ltd.

T /25P – ROCHON LEAD TOP MID *M.DIVERSUS*

145° 40'

40° 10'

40° 20'

T /18P

T /25P

CAPE BARREN

PERON

ADAMSON

ROCHON

TOURVILLE

NARIMBA WEST

NARIMBA 1

ROCHON SOUTH

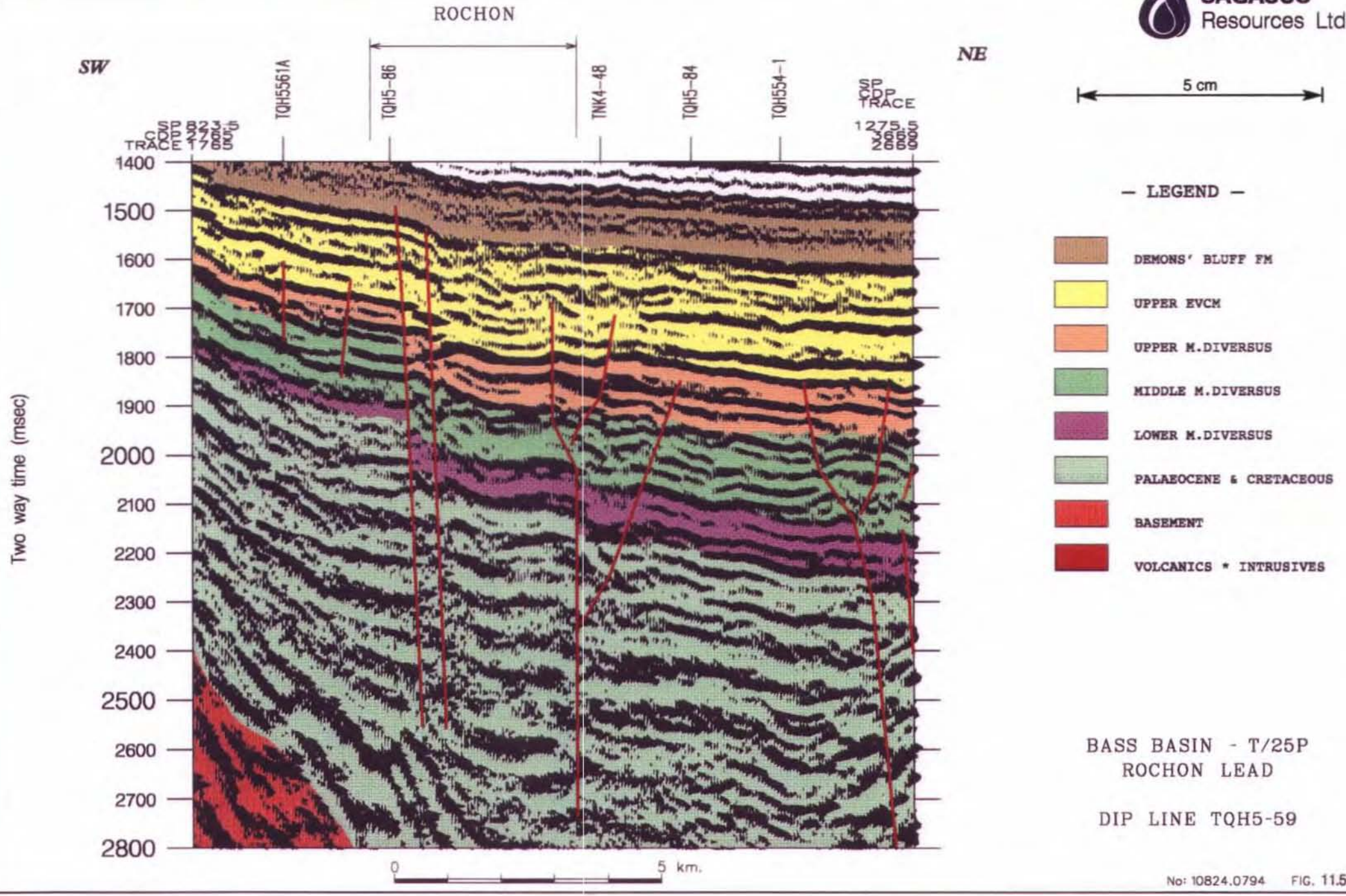
5 cm

0 Km 6

No: 10817.0794 FIG. 11.53

491297

SAGASCO Resources Ltd.



BASS BASIN - T/25P
ROCHON LEAD

DIP LINE TQH5-59

No: 10824.0794 FIG. 11.54

491298

PROSPECT DATA SHEET

ROCHON SOUTH

CATEGORY	Lead			
LOCATION	Seismic line TQH5-147 Sp 370 (middle *M.diversus*)			
DESCRIPTION OF TRAP	Low relief tilted fault block			
PRIMARY OBJECTIVES	EVCM	-	Middle *M.diversus*	
		-	Palaeocene	
MAXIMUM CLOSURE	EVCM	-	Middle *M.diversus*	9.0 square kilometres
			Palaeocene (possible closure)	
SECONDARY OBJECTIVES	None			
DEPTH TO TOP RESERVOIR	EVCM	-	Middle *M.diversus*	2363 mSS

DESCRIPTION OF RISK ELEMENTS

SOURCE

Rochon South is located at the northwestern end of the Pelican Trough which has proven gas and condensate generating potential. Maturity modelling predicts that at the middle *M.diversus* the sequence will be early mature for oil generation grading to mid-mature at the Palaeocene and the main gas mature window at basement. Source risk for gas is considered to be low at Rochon South and moderate for oil.

RESERVOIR

An average porosity of 24% is predicted for the middle *M.diversus* reservoirs declining to xx% at the Palaeocene. Reservoir risk is evaluated to be low to moderate at the middle *M.diversus* and high at the Palaeocene.

SEAL

Rochon South is dependent on the development of intraformational top seals and cross fault or fault plane seals. Sealing risk is ranked as moderate.

STRUCTURE

Structural closure is based on regionally spaced dip lines. Further data is required to determine if the structure is valid and if there is a spill point up the structural ramp on the northwest part of the structure. Structural movement on the fault bounding closure at Rochon South commenced in the Cretaceous with continued movement until deposition of the upper EVCM. Structural risk is moderate to high.

ADDITIONAL WORK REQUIREMENTS

Rochon South was not addressed in the Rocky Cape Seismic Survey.

491300

ROCHONS.XLS

ROCHON SOUTH - T/25P

EVCM Middle M diversus zone

RESERVES CALCULATION (Simple Slab Model)

	Depth (m)	Vertical Closure (m)	Area (sq km)	Bulk Rock Volume (cubic m)	Cum. OGIP (BCF)	Cum. Raw Gas (BCF)	Cum. Sales Gas (BCF)	Cum. Sales Gas (PJ)	Cum. Condensate (MMSTB)	Cum. OOIP (MMSTB)	Cum. REC. OIL (MMSTB)
1850	2363.3	10	2.11	6.34E+07	84.25	71.61	50.13	55.38	7.16	47.94	11.99
1860	2380	26.7	9.04	2.71E+08	360.09	306.07	214.25	236.71	30.61	204.90	51.23

RISKED SALES GAS (PJ)	19.88
RISKED REC OIL (MMSTB)	3.07

Input Parameters	
Net Pay (m)	30
Porosity	0.24
Sh	0.75
Bg	209
Boi	1.50
Condensate (BBL's/MMSCF)	100
Recovery factor (gas)	0.85
Recovery factor (oil)	0.25
Sales factor (gas)	0.7

RISK	%
SOURCE GAS	70%
SOURCE OIL	50%
SEAL	50%
RESERVOIR	60%
STRUCTURE	40%
CHANCE OF SUCCESS GAS	8.40%
CHANCE OF SUCCESS OIL	6.00%

24/05/94

491301

ROCHONS.XLS

ROCHON SOUTH - T/25P

EVCM Palaeocene

RESERVES CALCULATION (Simple Slab Model)

	Depth (m)	Vertical Closure (m)	Area (sq km)	Bulk Rock Volume (cubic m)	Cum. OGIP (BCF)	Cum. Raw Gas (BCF)	Cum. Sales Gas (BCF)	Cum. Sales Gas (PJ)	Cum. Condensate (MMSTB)	Cum. OOIP (MMSTB)	Cum. REC. OIL (MMSTB)
2080	2775.3	10	0.12	3.51E+06	3.94	3.35	2.34	2.59	0.33	1.99	0.50
2090	2791.1	25.79	0.23	6.99E+06	7.84	6.67	4.67	5.16	0.67	3.95	0.99
2100	2806.9	41.59	2.39	7.16E+07	80.39	68.33	47.83	52.85	6.83	40.53	10.13
2110	2836.6	71.28	7.75	2.32E+08	260.77	221.65	155.16	171.42	22.17	131.46	32.86
2120	2863.3	98.01	11.27	3.38E+08	379.24	322.35	225.65	249.30	32.24	191.18	47.79
2130	2885.6	120.29	13.15	3.95E+08	442.73	376.32	263.42	291.04	37.63	223.19	55.80
2140	2902.3	137.02	15.51	4.65E+08	522.21	443.88	310.72	343.29	44.39	263.25	65.81

RISKED SALES GAS (PJ)	14.42
RISKED REC OIL (MMSTB)	1.97

Input Parameters	
Net Pay (m)	30
Porosity	0.19
Sh	0.75
Bg	223
Boi	1.58
Condensate (BBL's/MMSCF)	100
Recovery factor (gas)	0.85
Recovery factor (oil)	0.25
Sales factor (gas)	0.7

RISK	%
SOURCE GAS	70%
SOURCE OIL	50%
SEAL	50%
RESERVOIR	30%
STRUCTURE	40%
CHANCE OF SUCCESS GAS	4.20%
CHANCE OF SUCCESS OIL	3.00%

24/05/94

491302

SAGASCO Resources Ltd.

T /25P – ROCHON SOUTH LEAD TOP MID *M.DIVERSUS*

145° 40'

40° 10'

40° 20'

T /18P

T /25P

CAPE BARREN

PERON

ADAMSON

ROCHON

NARIMBA WEST

TOURVILLE

NARIMBA 1

ROCHON SOUTH

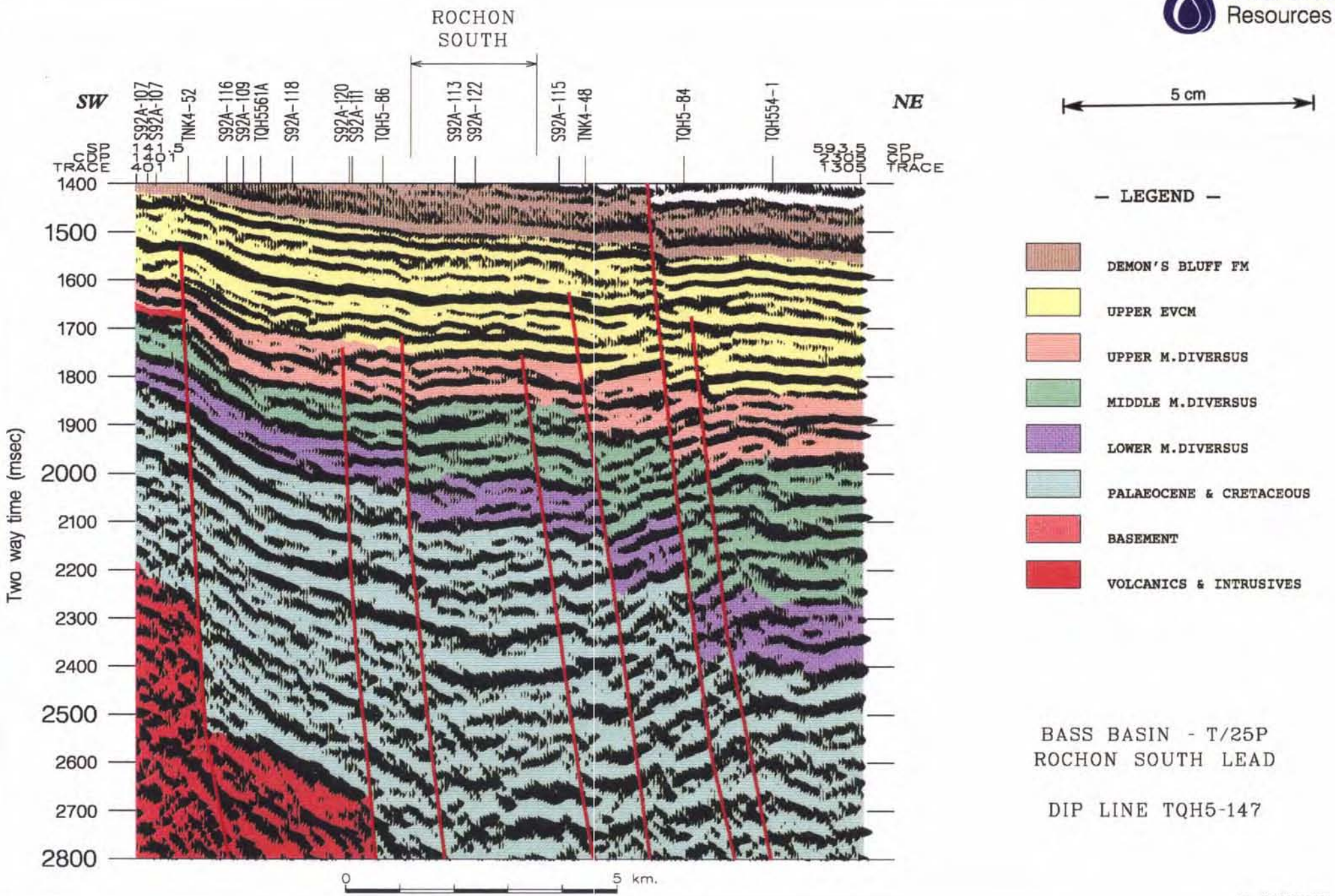
5 cm

0 Km 6

No: 10818.0794 FIG. 11.55

491303

SAGASCO Resources Ltd.



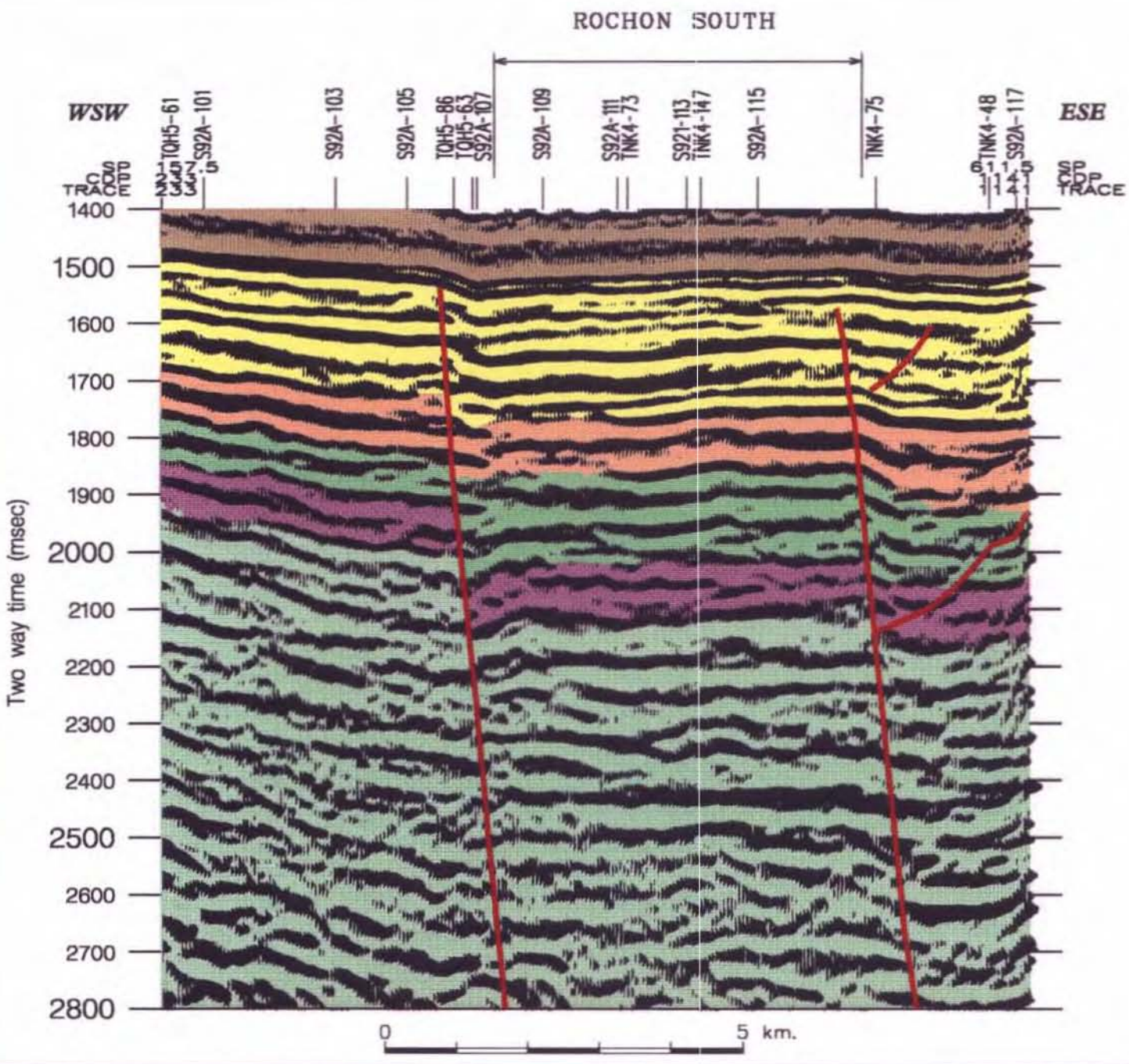
BASS BASIN - T/25P
ROCHON SOUTH LEAD

DIP LINE TQH5-147

No: 10787.0794 FIG.11.56

491304

SAGASCO Resources Ltd.



5 cm

— LEGEND —

- DEMON'S BLUFF FM
- UPPER EVCM
- UPPER M.DIVERSUS
- MIDDLE M.DIVERSUS
- LOWER M.DIVERSUS
- PALAEOCENE & CRETACEOUS
- BASEMENT
- VOLCANICS & INTRUSIVES

BASS BASIN - T/25P
ROCHON SOUTH LEAD

STRIKE LINE S92A-122

No: 10788.0794 FIG. 11.57

PROSPECT DATA SHEET

SURVILLE

CATEGORY	Lead			
LOCATION	Seismic line TNK4-44A Sp 700 (middle *M.diversus*) Seismic line TNK4-99 Sp 390 (Palaeocene)			
DESCRIPTION OF TRAP	Tilted fault block against northwest trending fault			
PRIMARY OBJECTIVES	EVCM	-	Middle *M.diversus* Palaeocene	
MAXIMUM CLOSURE	EVCM	-	Middle *M.diversus* Palaeocene	6.9 square kilometres 9.2 square kilometres
SECONDARY OBJECTIVES	None			
DEPTH TO TOP RESERVOIR	EVCM	-	Middle *M.diversus* Palaeocene	2542 mSS 3160 mSS

DESCRIPTION OF RISK ELEMENTS

SOURCE

Surville is located near to the axis of the Pelican Trough, and south of the Pelican Field, which has proven gas and condensate generating potential. Maturity modelling predicts that at the middle *M.diversus* the sequence will be middle mature for oil generation grading to middle-late mature at the Palaeocene and overmature at basement. Source risk for gas is rated as low and moderate for oil.

RESERVOIR

Porosity verses depth profiles predict a porosity of 22% for the middle *M.diversus* reservoirs decreasing to 15% in the Palaeocene. Reservoir parameters therefore will be similar to Pelican Field where deliverability remains conjectural. The lead represents a very similar location to that drilled by nearby Pelican 4. Reservoir risk is moderate to high.

SEAL

Surville is dependent on the development of intraformational top seals and cross fault or fault plane seals. Sealing risk is moderate at the middle *M.diversus* and low to moderate at the Palaeocene.

STRUCTURE

Structural closure is based on regionally spaced dip lines and a single strike line. Part of the lower closure is dependent on the presence of a poorly controlled north trending fault. Structurally the lead is very similar to the already drilled Pelican 4 structure. Structural risk is ranked as moderate.

ADDITIONAL WORK REQUIREMENTS

Surville was not addressed in the Rocky Cape Seismic Survey. Additional seismic data is required to investigate this lead.

491307

SURVILLE.XLS

SURVILLE - T/25P

EVCM Middle M diversus zone

RESERVES CALCULATION (Simple Slab Model)

	Depth (m)	Vertical Closure (m)	Area (sq km)	Bulk Rock Volume (cubic m)	Cum. OGIP (BCF)	Cum. Raw Gas (BCF)	Cum. Sales Gas (BCF)	Cum. Sales Gas (PJ)	Cum. Condensate (MMSTB)	Cum. OOIP (MMSTB)	Cum. REC. OIL (MMSTB)
1950	2542.7	10	0.63	1.88E+07	23.67	20.12	14.09	15.56	2.01	12.71	3.18
1960	2559.9	27.2	3.15	9.44E+07	118.82	101.00	70.70	78.11	10.10	63.81	15.95
1970	2576.6	43.9	6.87	2.06E+08	259.39	220.48	154.34	170.51	22.05	139.31	34.83

RISKED SALES GAS (PJ)	14.92
RISKED REC OIL (MMSTB)	2.18

Input Parameters	
Net Pay (m)	30
Porosity	0.22
Sh	0.75
Bg	216
Boi	1.54
Condensate (BBL's/MMSCF)	100
Recovery factor (gas)	0.85
Recovery factor (oil)	0.25
Sales factor (gas)	0.7

RISK	%
SOURCE GAS	70%
SOURCE OIL	50%
SEAL	50%
RESERVOIR	50%
STRUCTURE	50%
CHANCE OF SUCCESS GAS	8.75%
CHANCE OF SUCCESS OIL	6.25%

24/05/94

491308

SURVILLE.XLS

SURVILLE - T/25P

EVCM Palaeocene

RESERVES CALCULATION (Simple Slab Model)

	Depth (m)	Vertical Closure (m)	Area (sq km)	Bulk Rock Volume (cubic m)	Cum. OGIP (BCF)	Cum. Raw Gas (BCF)	Cum. Sales Gas (BCF)	Cum. Sales Gas (PJ)	Cum. Condensate (MMSTB)	Cum. OOIP (MMSTB)	Cum. REC. OIL (MMSTB)
2280	3160	10	0.09	2.61E+06	2.38	2.03	1.42	1.57	0.20	1.11	0.28
2290	3176.7	26.7	1.17	3.51E+07	32.04	27.24	19.07	21.07	2.72	14.90	3.73
2300	3193.8	43.8	2.44	7.33E+07	66.94	56.90	39.83	44.00	5.69	31.13	7.78
2310	3212.5	62.5	3.74	1.12E+08	102.52	87.14	61.00	67.39	8.71	47.67	11.92
2320	3231.3	81.3	7.37	2.21E+08	201.94	171.65	120.16	132.75	17.17	93.90	23.48
2330	3250	100	9.24	2.77E+08	253.26	215.27	150.69	166.48	21.53	117.77	29.44

RISKED SALES GAS (PJ)	6.99
RISKED REC OIL (MMSTB)	0.88

Input Parameters	
Net Pay (m)	30
Porosity	0.15
Sh	0.75
Bg	230
Boi	1.67
Condensate (BBL's/MMSCF)	100
Recovery factor (gas)	0.85
Recovery factor (oil)	0.25
Sales factor (gas)	0.7

RISK	%
SOURCE GAS	70%
SOURCE OIL	50%
SEAL	60%
RESERVOIR	20%
STRUCTURE	50%
CHANCE OF SUCCESS GAS	4.20%
CHANCE OF SUCCESS OIL	3.00%

24/05/94

SAGASCO Resources Ltd.

T/25P – SURVILLE WEAK LEAD TOP PALAEOCENE

145° 55'

146° 00'

40° 20'

40° 25'

40° 30'

PELICAN 4

EDDYSTONE

SURVILLE

TOMAHAWK

HUNTER

TREGARON

5 cm

0 Km 6

No: 10684.0794 FIG. 11.58

491310

SAGASCO Resources Ltd.

T /25P – SURVILLE LEAD TOP MID *M.DIVERSUS*

TOURVILLE

WARREGO

ACTAEON

PELICAN 5

PELICAN 4

EDDYSTONE

SURVILLE

HUNTER

145° 55'

40° 25'

40° 30'

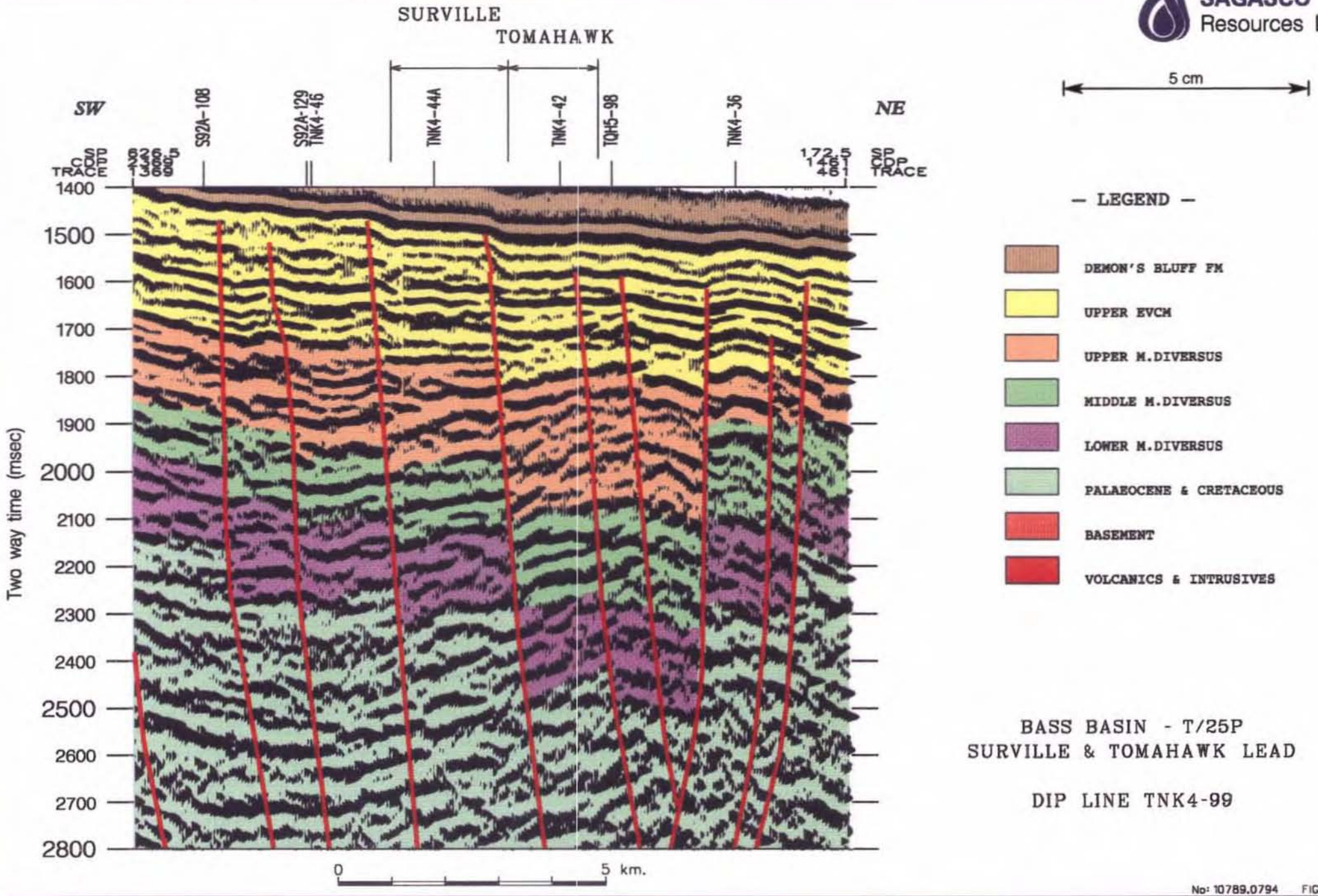
5 cm

0 Km 6

No. 10819.0794 FIG. 11.59

491311

SAGASCO Resources Ltd.



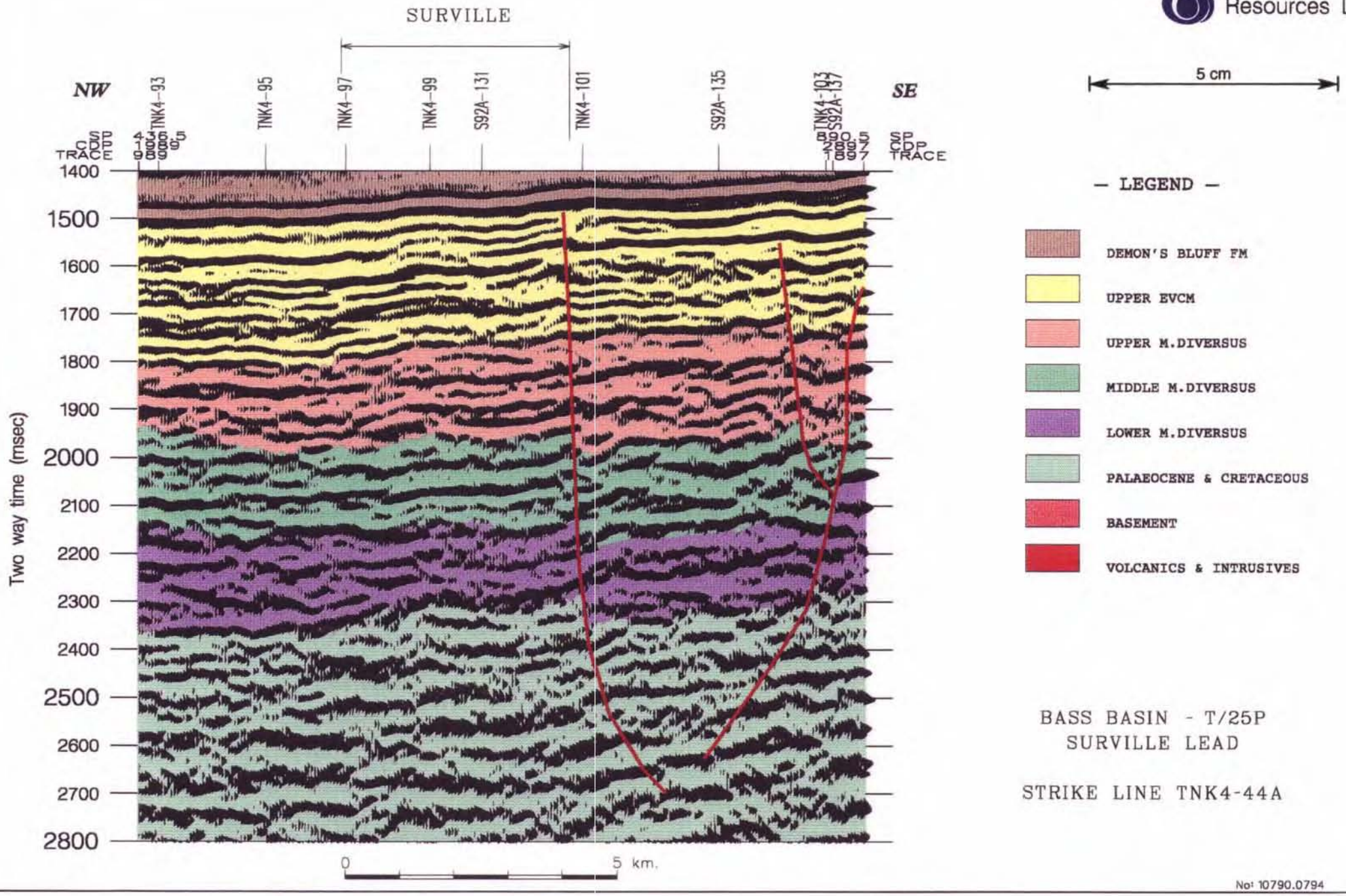
BASS BASIN - T/25P
SURVILLE & TOMAHAWK LEAD

DIP LINE TNK4-99

No: 10789.0794 FIG. 11.60

491312

SAGASCO Resources Ltd.



BASS BASIN - T/25P
SURVILLE LEAD

STRIKE LINE TNK4-44A

No: 10790.0794 FIG 11.61

PROSPECT DATA SHEET

TOMAHAWK

CATEGORY Weak lead

LOCATION Seismic line TNK4-99 Sp 330 (Palaeocene)

DESCRIPTION OF TRAP Small tilted fault block against northwest trending fault

PRIMARY OBJECTIVES EVCM - Palaeocene

MAXIMUM CLOSURE EVCM - Palaeocene 3.8 square kilometres

SECONDARY OBJECTIVES None

DEPTH TO TOP RESERVOIR EVCM - Palaeocene 3401 mSS

DESCRIPTION OF RISK ELEMENTS

SOURCE

Tomahawk is located on the southeastern flank of the Pelican Trough which has proven gas and condensate generating potential. Maturity modelling predicts that the Palaeocene sediments are late mature for oil-generation grading to overmature for all hydrocarbon generation at basement. Migration is required by vertical sourcing up fault conduits. Source risk for gas is rated as low, whilst oil source is moderate.

RESERVOIR

The only objective at Tomahawk are fluvial sandstones in the Palaeocene part of the EVCM, which are deeply buried with probable average porosity of 12% and therefore very low permeability. Reservoir quality at Tomahawk therefore carries a very high risk.

SEAL

Surville is dependent on the development of intraformational top seals and cross fault or fault plane seals. Sealing risk is low to moderate.

STRUCTURE

Tomahawk is defined on only two regionally spaced dip lines, and therefore the structural interpretation carries moderate to high risk.

ADDITIONAL WORK REQUIREMENTS

Tomahawk was not addressed in the Rocky Cape Seismic Survey. The high risk and small size of Tomahawk lead to a recommendation that additional work is not required at this lead.

491314

TOMAHAWK.XLS

TOMAHAWK - T/25P

EVCM Palaeocene

RESERVES CALCULATION (Simple Slab Model)

	Depth (m)	Vertical Closure (m)	Area (sq km)	Bulk Rock Volume (cubic m)	Cum. OGIP (BCF)	Cum. Raw Gas (BCF)	Cum. Sales Gas (BCF)	Cum. Sales Gas (PJ)	Cum. Condensate (MMSTB)	Cum. OOIP (MMSTB)	Cum. REC. OIL (MMSTB)
2410	3401.9	10	0.09	2.73E+06	2.04	1.73	1.21	1.34	0.17	0.90	0.23
2420	3420.9	29	0.39	1.17E+07	8.76	7.45	5.21	5.76	0.74	3.87	0.97
2430	3439.1	47.2	1.07	3.21E+07	23.95	20.36	14.25	15.75	2.04	10.58	2.64
2440	3456.7	64.8	1.64	4.91E+07	36.68	31.18	21.82	24.11	3.12	16.20	4.05
2450	3473.4	81.5	2.69	8.07E+07	60.25	51.21	35.85	39.61	5.12	26.61	6.65
2460	3490.1	98.2	3.75	1.12E+08	83.91	71.33	49.93	55.16	7.13	37.06	9.26

RISKED SALES GAS (PJ)	0.93
RISKED REC OIL (MMSTB)	0.11

Input Parameters	
Net Pay (m)	30
Porosity	0.12
Sh	0.75
Bg	235
Boi	1.72
Condensate (BBL's/MMSCF)	100
Recovery factor (gas)	0.85
Recovery factor (oil)	0.25
Sales factor (gas)	0.7

RISK	%
SOURCE GAS	70%
SOURCE OIL	50%
SEAL	60%
RESERVOIR	10%
STRUCTURE	40%
CHANCE OF SUCCESS GAS	1.68%
CHANCE OF SUCCESS OIL	1.20%

24/05/94

491315

146° 55'

146° 00'

SAGASCO Resources Ltd.

T/25P – TOMAHAWK WEAK LEAD TOP PALAEOCENE

ACTAEON

WARREGO

EDDYSTONE

SURVILLE

TOMAHAWK

HUNTER

TREGARON

40° 20'

40° 25'

40° 30'

5 cm

0 Km 6

No: 10685.0794 FIG.11.62

PROSPECT DATA SHEET

TOURVILLE

CATEGORY	Strong lead		
LOCATION	Seismic line TNK4-79 Sp 290 (middle *M.diversus*) Seismic line TNK4-81 Sp 740 (Palaeocene)		
DESCRIPTION OF TRAP	Anticlinal closure exists at top EVCM and upper *M.diversus*, whilst the structure is predominantly fault controlled at deeper levels.		
PRIMARY OBJECTIVES	EVCM - Middle *M.diversus* - Palaeocene		
MAXIMUM CLOSURE	EVCM - Upper *M.diversus*	21.2 square kilometres	
	Middle *M.diversus*	32.0 square kilometres	
	Palaeocene	23.5 square kilometres	
SECONDARY OBJECTIVES	EVCM - top of formation - Upper *M.diversus*		
DEPTH TO TOP RESERVOIR	EVCM - Upper *M.diversus*	2233 mSS	
	Middle *M.diversus*	2363 mSS	
	Palaeocene	2807 mSS	

DESCRIPTION OF RISK ELEMENTS

SOURCE

Tourville at the middle *M.diversus* and Palaeocene levels is located on the first fault terrace stepping down from the Pelican 3 high and therefore has direct access to proven mature source rocks in the Pelican Trough. Maturity modelling predicts that the middle *M.diversus* sequence is early-middle mature for oil generation grading to middle mature at the Palaeocene and increasing to gas maturity at basement.

Tourville has the potential for cross-fault face loading of the Palaeocene reservoirs by mature upper Cretaceous source rocks. Similarly the middle *M.diversus* reservoirs could be charged across the fault from mature Palaeocene source intervals.

Migration of hydrocarbons into the upper EVCM and upper *M.diversus* reservoirs is considered higher risk due to the difficulty in migrating vertically through the shaly sequences of the lower and middle *M.diversus*, therefore these targets are only carried as secondary objectives. Sourcing of gas to the primary objectives at Tourville is considered low risk, whilst oil is ranked as moderate risk.

491317

RESERVOIR

Regional porosity verses depth profiles predict that the upper *M.diversus* reservoirs will have average porosities of 25% declining to 24% at the middle *M.diversus* and 18% at the Palaeocene. There is therefore a good chance of developing reservoir quality sandstones with sufficient permeability to maintain offshore production rates, particularly within the upper and middle *M.diversus* zones. Reservoir risk is very low at the upper levels, low to moderate at the middle *M.diversus* and high at the Palaeocene.

SEAL

Tourville is dependent on the development of intraformational top seals and cross fault or fault plane seals. Sealing risk is very low at the upper EVCM, high at the upper *M.diversus*, moderate at the middle *M.diversus* and low to moderate at the Palaeocene.

STRUCTURE

Tourville is defined on a regionally spaced seismic grid, and some limited but detailed coverage at the margin of the 1km 1977 Pelican Field grid. The current seismic interpretation therefore carries moderate risk. New data currently being processed will allow a more robust structural interpretation. A possible extension of closure down dip could result in a large closure which would include the Actaeon lead.

Faulting at Tourville was active until the upper *M.diversus*.

ADDITIONAL WORK REQUIREMENTS

New seismic data was recorded over Tourville during the Rocky Cape Seismic Survey which is currently being processed. Tourville will be remapped when this data is available.

491318

TOURVILL.XLS

TOURVILLE - T/25P

Upper EVCM

RESERVES CALCULATION (Simple Slab Model)

	Depth (m)	Vertical Closure (m)	Area (sq km)	Bulk Rock Volume (cubic m)	Cum. OGIP (BCF)	Cum. Raw Gas (BCF)	Cum. Sales Gas (BCF)	Cum. Sales Gas (PJ)	Cum. Condensate (MMSTB)	Cum. OOIP (MMSTB)	Cum. REC. OIL (MMSTB)
1550	1873.1	10	0.21	6.39E+06	9.42	8.01	5.61	6.19	0.80	6.27	1.57
1560	1888.5	25.34	1.91	5.72E+07	84.37	71.71	50.20	55.46	7.17	56.13	14.03

RISKED SALES GAS (PJ)	5.32
RISKED REC OIL (MMSTB)	1.35

Input Parameters	
Net Pay (m)	30
Porosity	0.29
Sh	0.75
Bg	192
Boi	1.39
Condensate (BBL's/MMSCF)	100
Recovery factor (gas)	0.85
Recovery factor (oil)	0.25
Sales factor (gas)	0.7

RISK	%
SOURCE GAS	30%
SOURCE OIL	30%
SEAL	80%
RESERVOIR	80%
STRUCTURE	50%
CHANCE OF SUCCESS GAS	9.60%
CHANCE OF SUCCESS OIL	9.60%

24/05/94

TOURVILL.XLS

TOURVILLE - T/25P

EVCM Upper M diversus

RESERVES CALCULATION (Simple Slab Model)

	Depth (m)	Vertical Closure (m)	Area (sq km)	Bulk Rock Volume (cubic m)	Cum. OGIP (BCF)	Cum. Raw Gas (BCF)	Cum. Sales Gas (BCF)	Cum. Sales Gas (PJ)	Cum. Condensate (MMSTB)	Cum. OOIP (MMSTB)	Cum. REC. OIL (MMSTB)
1770	2233.3	10	0.21	6.39E+06	8.67	7.37	5.16	5.70	0.74	5.13	1.28
1780	2250	26.7	1.91	5.72E+07	77.65	66.01	46.20	51.05	6.60	45.89	11.47
1790	2266.7	43.4	12.21	3.66E+08	497.20	422.62	295.83	326.84	42.26	293.81	73.45
1800	2283.3	60	21.18	6.35E+08	862.59	733.20	513.24	567.04	73.32	509.74	127.43

RISKED SALES GAS (PJ)	16.33
RISKED REC OIL (MMSTB)	3.67

Input Parameters	
Net Pay (m)	30
Porosity	0.25
Sh	0.75
Bg	205
Boi	1.47
Condensate (BBL's/MMSCF)	100
Recovery factor (gas)	0.85
Recovery factor (oil)	0.25
Sales factor (gas)	0.7

RISK	%
SOURCE GAS	30%
SOURCE OIL	30%
SEAL	30%
RESERVOIR	80%
STRUCTURE	40%
CHANCE OF SUCCESS GAS	2.88%
CHANCE OF SUCCESS OIL	2.88%

24/05/94

491320

TOURVILL.XLS

TOURVILLE - T/25P

EVCM Middle M diversus zone

RESERVES CALCULATION (Simple Slab Model)

	Depth (m)	Vertical Closure (m)	Area (sq km)	Bulk Rock Volume (cubic m)	Cum. OGIP (BCF)	Cum. Raw Gas (BCF)	Cum. Sales Gas (BCF)	Cum. Sales Gas (PJ)	Cum. Condensate (MMSTB)	Cum. OOIP (MMSTB)	Cum. REC. OIL (MMSTB)
1850	2363.3	10	0.21	6.36E+06	8.57	7.28	5.10	5.63	0.73	4.81	1.20
1860	2380	26.7	0.66	1.97E+07	26.48	22.51	15.76	17.41	2.25	14.85	3.71
1870	2396.7	43.4	2.38	7.15E+07	96.30	81.85	57.30	63.30	8.19	54.02	13.51
1880	2413.4	60.1	9.83	2.95E+08	397.23	337.65	236.35	261.13	33.76	222.84	55.71
1890	2430.1	76.8	18.58	5.57E+08	750.97	638.32	446.83	493.66	63.83	421.28	105.32
1900	2447	93.7	22.55	6.77E+08	911.62	774.88	542.42	599.27	77.49	511.40	127.85
1910	2464	110.7	24.46	7.34E+08	988.72	840.41	588.29	649.95	84.04	554.65	138.66
1920	2484.9	131.6	27.07	8.12E+08	1094.31	930.17	651.12	719.36	93.02	613.89	153.47
1930	2505.8	152.5	28.93	8.68E+08	1169.43	994.01	695.81	768.74	99.40	656.03	164.01
1940	2524.5	171.2	32.00	9.60E+08	1293.46	1099.44	769.61	850.27	109.94	725.60	181.40

RISKED SALES GAS (PJ)	89.28
RISKED REC OIL (MMSTB)	13.61

Input Parameters	
Net Pay (m)	30
Porosity	0.24
Sh	0.75
Bg	212
Boi	1.50
Condensate (BBL's/MMSCF)	100
Recovery factor (gas)	0.85
Recovery factor (oil)	0.25
Sales factor (gas)	0.7

RISK	%
SOURCE GAS	70%
SOURCE OIL	50%
SEAL	50%
RESERVOIR	60%
STRUCTURE	50%
CHANCE OF SUCCESS GAS	10.50%
CHANCE OF SUCCESS OIL	7.50%

24/05/94

491321

TOURVILL.XLS

TOURVILLE - T/25P

EVCM Palaeocene

RESERVES CALCULATION (Simple Slab Model)

	Depth (m)	Vertical Closure (m)	Area (sq km)	Bulk Rock Volume (cubic m)	Cum. OGIP (BCF)	Cum. Raw Gas (BCF)	Cum. Sales Gas (BCF)	Cum. Sales Gas (PJ)	Cum. Condensate (MMSTB)	Cum. OOIP (MMSTB)	Cum. REC. OIL (MMSTB)
2100	2806.9	10	0.22	6.54E+06	6.95	5.91	4.14	4.57	0.59	3.49	0.87
2110	2836.6	39.7	1.03	3.10E+07	32.95	28.00	19.60	21.66	2.80	16.54	4.13
2120	2863.3	66.4	1.95	5.86E+07	62.29	52.94	37.06	40.95	5.29	31.27	7.82
2130	2885.6	88.7	5.81	1.74E+08	185.30	157.51	110.25	121.81	15.75	93.02	23.26
2140	2902.3	105.4	10.11	3.03E+08	322.28	273.94	191.76	211.86	27.39	161.79	40.45
2150	2917.7	120.8	13.47	4.04E+08	429.44	365.03	255.52	282.30	36.50	215.58	53.90
2160	2933.8	136.9	15.13	4.54E+08	482.67	410.27	287.19	317.29	41.03	242.30	60.58
2170	2952.5	155.6	16.75	5.03E+08	534.21	454.08	317.86	351.17	45.41	268.18	67.04
2180	2971.3	174.4	19.12	5.73E+08	609.67	518.22	362.76	400.78	51.82	306.06	76.51
2190	2990	193.1	23.52	7.06E+08	750.07	637.56	446.29	493.07	63.76	376.54	94.13

RISKED SALES GAS (PJ)	31.06
RISKED REC OIL (MMSTB)	4.24

Input Parameters	
Net Pay (m)	30
Porosity	0.18
Sh	0.75
Bg	223
Boi	1.59
Condensate (BBL's/MMSCF)	100
Recovery factor (gas)	0.85
Recovery factor (oil)	0.25
Sales factor (gas)	0.7

RISK	%
SOURCE GAS	70%
SOURCE OIL	50%
SEAL	60%
RESERVOIR	30%
STRUCTURE	50%
CHANCE OF SUCCESS GAS	6.30%
CHANCE OF SUCCESS OIL	4.50%

24/05/94

491322

SAGASCO Resources Ltd.

T/25P – TOURVILLE STRONG LEAD TOP PALAEOCENE

145° 50'

40° 15'

PELICAN 3

TOURVILLE

HILLIARD

PELICAN 2

ACTAEON

PELICAN FIELD

PELICAN 1

PELICAN 5

PELICAN 4

GRINDSTONE

EDDYSTONE

5 cm

0 Km 6

40° 25'

145° 50'

No: 10686.0794 FIG. 11.63

491323

SAGASCO Resources Ltd.

T/25P – TOURVILLE STRONG LEAD
TOP MID *M.DIVERSUS*

145° 50'

40° 15'

40° 20'

CAPE BARREN

ADAMSON

TOURVILLE

WARREGO

ACTAEON

EDDYSTONE

SURVILLE

PELICAN 1

PELICAN 2

PELICAN 3

PELICAN 4

PELICAN 5

5 cm

0 Km 6

No: 10664.0794 FIG. 11.64

491324

SAGASCO Resources Ltd.

T /25P – TOURVILLE WEAK LEAD TOP UPPER *M.DIVERSUS*

145° 55'

40° 10'

40° 15'

T/18P

T /25P

CAPE BARREN

TOURVILLE

PELICAN 3

PELICAN 2

PELICAN 1

PELICAN 5

PELICAN 4

5 cm

0 Km 6

No: 10670.0794 FIG. 11.65

491325

SAGASCO Resources Ltd.

T/25P – TOURVILLE STRONG LEAD TOP EVCM

145° 50'

140° 55'

40° 15'

40° 20'

40° 25'

TOURVILLE

PELICAN 1

PELICAN 2

PELICAN 3

PELICAN 4

PELICAN 5

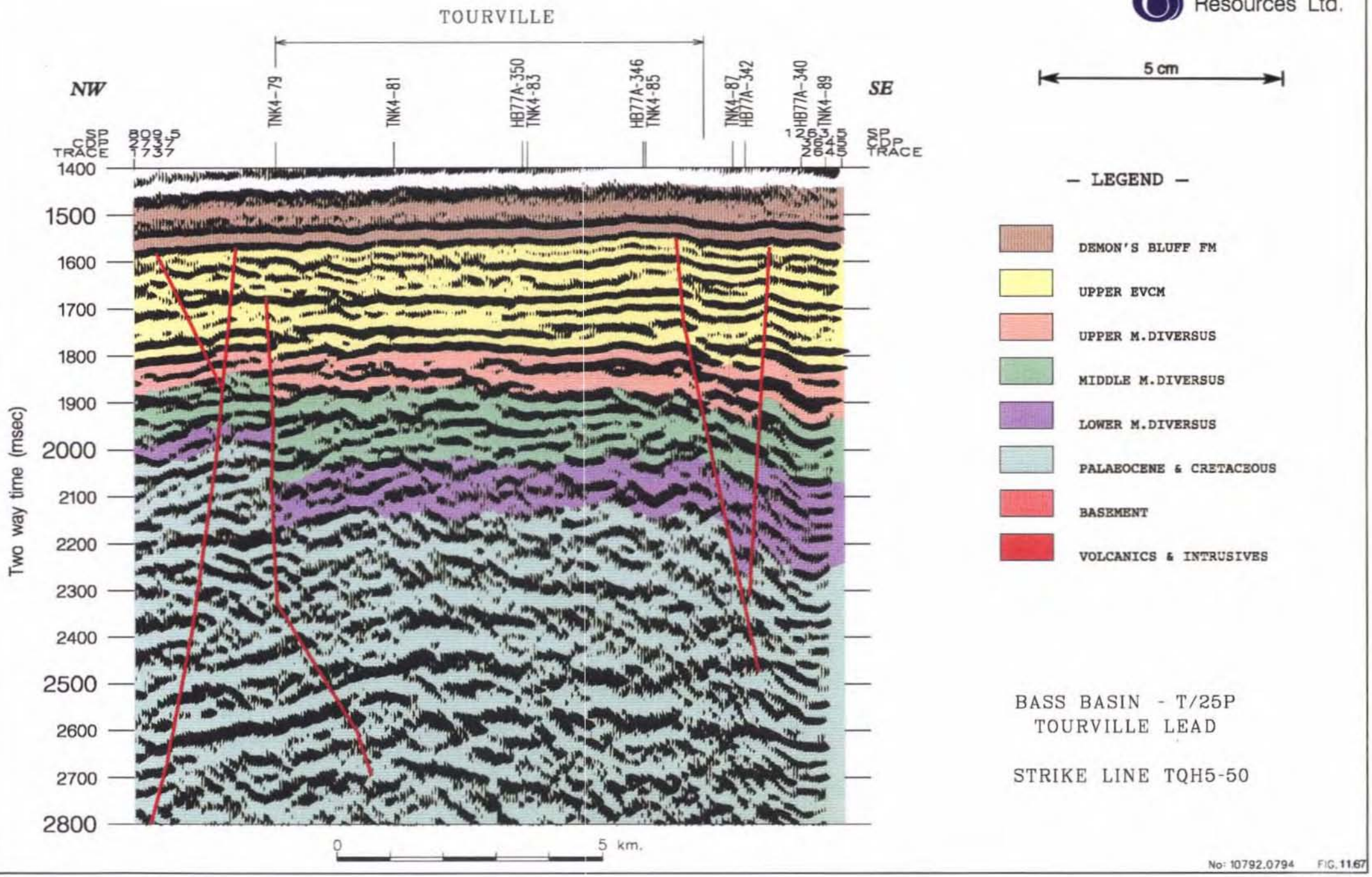
5 cm

0 Km 6

No: 10672.0794 FIG. 11.66

491326

SAGASCO Resources Ltd.



BASS BASIN - T/25P
TOURVILLE LEAD

STRIKE LINE TQH5-50

No: 10792.0794 FIG. 11.67

491327

PROSPECT DATA SHEET

TREGARON

CATEGORY Weak Lead

LOCATION Seismic line S92A-139 Sp 200 (Palaeocene)

DESCRIPTION OF TRAP Tilted fault block with closure against north west trending fault.

PRIMARY OBJECTIVES	EVCM	-	Palaeocene	
MAXIMUM CLOSURE	EVCM	-	Palaeocene	6.4 square kilometres
SECONDARY OBJECTIVES	EVCM	-	Middle *M.diversus*	(minor closure)
DEPTH TO TOP RESERVOIR	EVCM	-	Palaeocene	2594 mSS

DESCRIPTION OF RISK ELEMENTS

SOURCE

Tregaron is located on the Southwestern Ramp 4 kilometres and updip from the Grindstone fault, which bounds the Pelican Trough. Migration to the prospect therefore is dependent on relatively long distance migration from mature source material in the Pelican Trough. Such a migration route is made tortuous by the presence of a number of northwest trending normal faults between the Trough and Tregaron. However the Grindstone fault might allow vertical migration from mature source rocks into carrier beds downdip of Tregaron allowing relatively simple migration of hydrocarbons into the structure. Source and migration risk are therefore considered to be low to moderate for gas and moderate for oil at Tregaron.

RESERVOIR

The shallow depth of burial of the primary target at Tregaron, the Palaeocene, results in a predicted average porosity of 21%. Therefore reservoir risk is considered to be moderate to high.

SEAL

Tregaron is dependent on the development of intraformational top seals and cross fault or fault plane seals. Sealing risk is rated as low to moderate.

491328

STRUCTURE

Tregaron is poorly controlled on a broad regional seismic grid, and therefore carries a very high structural risk. Structural movement occurred on the bounding fault at Tregaron from Palaeocene through to lower *M.diversus* time.

ADDITIONAL WORK REQUIREMENTS

Tregaron was not addressed by the Rocky Cape Seismic Survey although some seismic lines currently being reprocessed seismic which cross the southeastern part of the lead will allow further resolution of the structural configuration at Tregaron.

491329

TREGARON.XLS

TREGARON - T/25P

EVCM Palaeocene

RESERVES CALCULATION (Simple Slab Model)

	Depth (m)	Vertical Closure (m)	Area (sq km)	Bulk Rock Volume (cubic m)	Cum. OGIP (BCF)	Cum. Raw Gas (BCF)	Cum. Sales Gas (BCF)	Cum. Sales Gas (PJ)	Cum. Condensate (MMSTB)	Cum. OOIP (MMSTB)	Cum. REC. OIL (MMSTB)
1980	2594	10	0.14	4.14E+06	5.02	4.27	2.99	3.30	0.43	2.65	0.66
1990	2614	30	0.43	1.28E+07	15.57	13.23	9.26	10.23	1.32	8.23	2.06
2000	2634	50	0.76	2.28E+07	27.64	23.50	16.45	18.17	2.35	14.61	3.65
2010	2654	70	1.12	3.36E+07	40.74	34.63	24.24	26.78	3.46	21.53	5.38
2020	2673.3	89.3	1.72	5.17E+07	62.64	53.24	37.27	41.18	5.32	33.10	8.27
2030	2690	106	2.59	7.77E+07	94.21	80.08	56.06	61.93	8.01	49.78	12.45
2040	2706.6	122.6	3.46	1.04E+08	125.89	107.01	74.91	82.76	10.70	66.52	16.63
2050	2724.6	140.6	4.85	1.45E+08	176.31	149.86	104.90	115.90	14.99	93.16	23.29
2060	2742.7	158.7	6.43	1.93E+08	233.71	198.65	139.06	153.63	19.87	123.49	30.87

RISKED SALES GAS (PJ)	4.42
RISKED REC OIL (MMSTB)	0.74

Input Parameters	
Net Pay (m)	30
Porosity	0.21
Sh	0.75
Bg	218
Boi	1.55
Condensate (BBL's/MMSCF)	100
Recovery factor (gas)	0.85
Recovery factor (oil)	0.25
Sales factor (gas)	0.7

RISK	%
SOURCE GAS	60%
SOURCE OIL	50%
SEAL	60%
RESERVOIR	40%
STRUCTURE	20%
CHANCE OF SUCCESS GAS	2.88%
CHANCE OF SUCCESS OIL	2.40%

24/05/94

491330

SAGASCO Resources Ltd.

T/25P – TREGARON WEAK LEAD
TOP PALAEOCENE

146° 00'

146° 05'

40° 25'

40° 30'

40° 35'

SURVILLE

TOMAHAWK

TREGARON

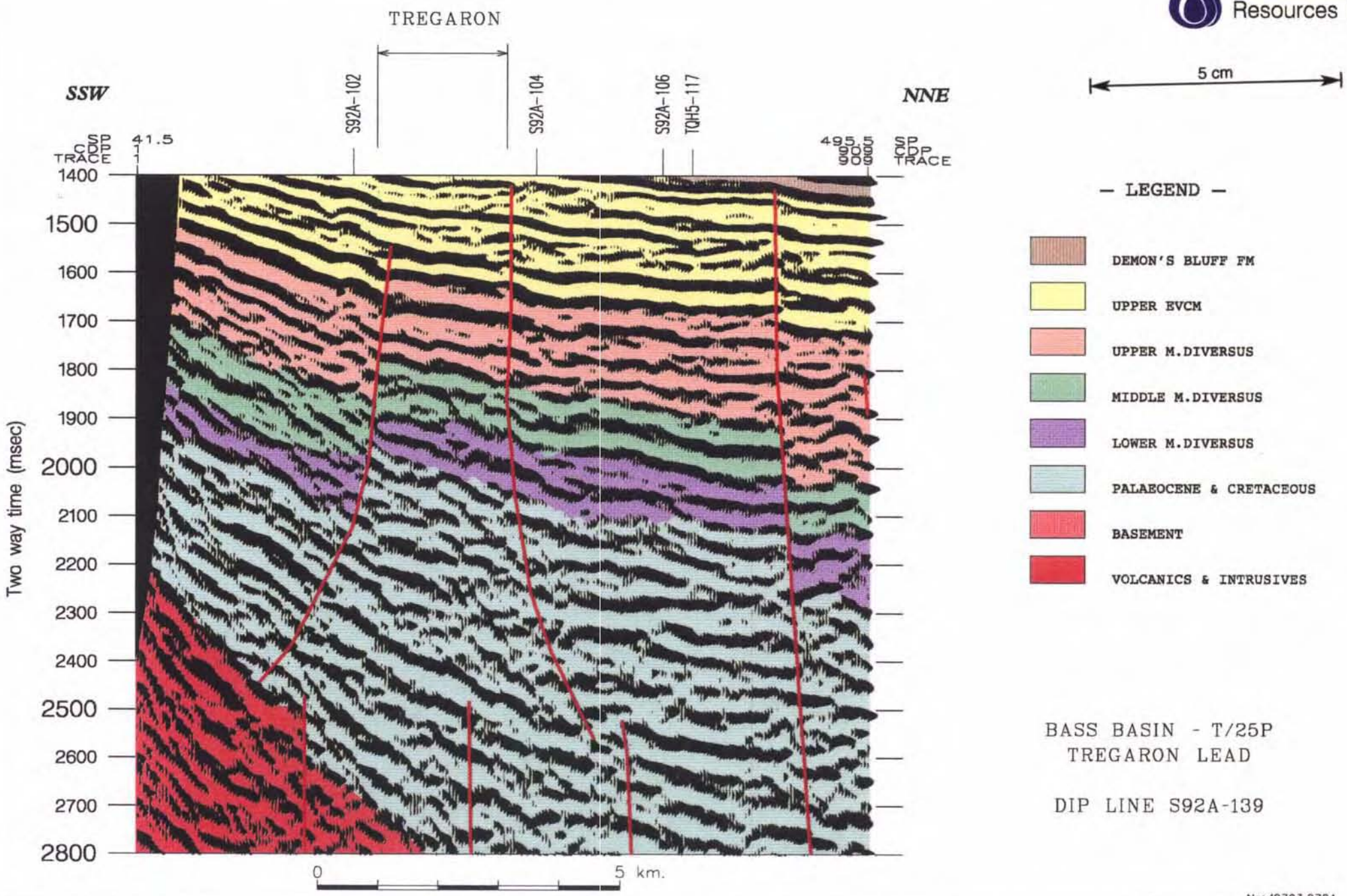
0 Km 6

5 cm

No: 10687.0794 FIG.11.68

491331

SAGASCO Resources Ltd.



BASS BASIN - T/25P
TREGARON LEAD

DIP LINE S92A-139

No: 10793.0794 FIG.11.69

PROSPECT DATA SHEET

VERIDIAN

CATEGORY	Weak Lead
LOCATION	Seismic line TQH5-101 Sp 1150 (Palaeocene)
DESCRIPTION OF TRAP	Low relief anticline
PRIMARY OBJECTIVES	EVCM - Palaeocene
MAXIMUM CLOSURE	EVCM - Palaeocene 26.5 square kilometres
SECONDARY OBJECTIVES	EVCM - Middle *M.diversus* (possible closure)
DEPTH TO TOP RESERVOIR	EVCM - Palaeocene 2760 mSS

DESCRIPTION OF RISK ELEMENTS

SOURCE

Veridian is located south of Poonboon 1 on the Poonboon Platform. The source potential of this structural province is untested as Poonboon 1 was drilled outside of closure at the objective Palaeocene level. At Veridian the middle *M.diversus* is early mature for oil generation grading to middle mature at the Palaeocene and the gas window at basement. The Palaeocene level therefore has the potential for either an oil or gas charge both of which are rated as moderate risk.

Veridian is dependent on vertical migration to charge the trap or on distant migration from the northern trough area near Nangkero 1 and Dondu 1.

RESERVOIR

Nangkero 1 and Poonboon 1 have shown that the Poonboon Platform is characterised by generally better reservoir quality than the wells drilled in the Pelican Trough. An average porosity of 21% is predicted for the Palaeocene targets at Veridian. Reservoir risk is considered to be moderate to high.

SEAL

If the anticlinal form of Veridian is confirmed by further seismic data then there is a very good chance that intraformational seals could provide viable traps. Sealing risk is rated as low.

STRUCTURE

Veridian is very poorly controlled on a widely spaced regional seismic grid and could fragment into smaller closures with additional detailed seismic data. Structural closure is therefore rated as high risk.

ADDITIONAL WORK REQUIREMENTS

Veridian was not addressed by the Rocky Cape Seismic Survey. Additional seismic data is recommended at Veridian to determine whether closure exists.

491334

VERIDIAN.XLS

VERIDIAN - T/25P

EVCM Palaeocene

RESERVES CALCULATION (Simple Slab Model)

	Depth (m)	Vertical Closure (m)	Area (sq km)	Bulk Rock Volume (cubic m)	Cum. OGIP (BCF)	Cum. Raw Gas (BCF)	Cum. Sales Gas (BCF)	Cum. Sales Gas (PJ)	Cum. Condensate (MMSTB)	Cum. OOIP (MMSTB)	Cum. REC. OIL (MMSTB)
2070	2759.5	10	1.05	3.15E+07	38.19	32.46	22.73	25.11	3.25	19.74	4.93
2080	2775.3	25.8	5.88	1.76E+08	213.88	181.80	127.26	140.60	18.18	110.53	27.63
2090	2791.1	41.6	26.54	7.96E+08	965.38	820.57	574.40	634.61	82.06	498.87	124.72

RISKED SALES GAS (PJ)	26.65
RISKED REC OIL (MMSTB)	5.24

Input Parameters	
Net Pay (m)	30
Porosity	0.21
Sh	0.75
Bg	218
Boi	1.58
Condensate (BBL's/MMSCF)	100
Recovery factor (gas)	0.85
Recovery factor (oil)	0.25
Sales factor (gas)	0.7

RISK	%
SOURCE GAS	50%
SOURCE OIL	50%
SEAL	70%
RESERVOIR	40%
STRUCTURE	30%
CHANCE OF SUCCESS GAS	4.20%
CHANCE OF SUCCESS OIL	4.20%

24/05/94

PROSPECT DATA SHEET

WARREGO

CATEGORY	Lead		
LOCATION	Seismic line TNK4-97 Sp 410 (middle *M.diversus*) Seismic line TNK4-97 Sp 420 (Palaeocene)		
DESCRIPTION OF TRAP	Complex tilted fault block		
PRIMARY OBJECTIVES	EVCM -	Middle *M.diversus* Palaeocene	
MAXIMUM CLOSURE	EVCM -	Middle *M.diversus* Palaeocene	28.9 square kilometres 13.8 square kilometres
SECONDARY OBJECTIVES	None		
DEPTH TO TOP RESERVOIR	EVCM -	Middle *M.diversus* Palaeocene	2233 mSS 2397 mSS

DESCRIPTION OF RISK ELEMENTS

SOURCE

Warrego is located at the southern end of the Pelican 3 high, at the south western end of the Poonboon Platform, and updip of the Actaeon lead. For this reason the prospect is dependent on sourcing either from spillage from Actaeon, vertical migration up faults, or from migration from probable but unproven mature areas to the northeast of the lead. At Warrego the middle *M.diversus* is early-mature for oil generation grading to early-middle mature at the Palaeocene and is in the late gas generation window at basement. Source risk for gas at Warrego is rated as low to moderate whilst oil charge is ranked as moderate.

RESERVOIR

At Warrego a similar stratigraphic sequence is predicted to that encountered in Pelican 3, that is a condensed Eocene sedimentary section overlying the Palaeocene. Therefore the middle *M.diversus* objective will be thin, but this will be partly compensated for by good reservoir preservation with average porosity of at least 25%. Similarly the Palaeocene has not been buried as deeply as in the Pelican Trough and average porosities of approximately 25% are predicted. With the exception of Pelican 3 to the north, well control is poor and there is scope for significant facies variations to occur at Warrego. For example Baillie *et al* (1991) postulated that upper delta plain stacked point-bar sequences might provide better reservoir targets in this southern part of the basin. Reservoir quality and distribution at Warrego is therefore considered low to moderate risk in the middle *M.diversus* and moderate risk in the Palaeocene.

SEAL

Closure at Warrego is dependent on proven intraformational top sealing units in the middle *M.diversus* and Palaeocene which have low risk, and fault plane seals or juxtaposition with shale units on at least two orthogonal faults which have moderate risk. The Palaeocene reservoir sequences are juxtaposed against potential sealing units in the middle and lower *M.diversus* across the Warrego Fault.

STRUCTURE

Warrego is poorly controlled on the southern margin of the closure. The structural setting of Warrego is similar to Pelican 3 which failed as a trapping mechanism. However Warrego is updip of Pelican 3 at the Palaeocene and deeper levels. Therefore the structural risk at Warrego is considered to be moderate to high. Fault movement along the bounding Warrego Fault is observed to have been active through until the deposition of the upper EVCM. At the northern margin of the structure a sequence of thin extrusive volcanics are observed on seismic near the top of the EVCM, however these deposits do not affect the mapped closures.

ADDITIONAL WORK REQUIREMENTS

Warrego was included in the Rocky Cape Seismic Survey and will be remapped when that data is processed.

WARREGO.XLS

WARREGO - T/25P

EVCM Middle M diversus zone

RESERVES CALCULATION (Simple Slab Model)

	Depth (m)	Vertical Closure (m)	Area (sq km)	Bulk Rock Volume (cubic m)	Cum. OGIP (BCF)	Cum. Raw Gas (BCF)	Cum. Sales Gas (BCF)	Cum. Sales Gas (PJ)	Cum. Condensate (MMSTB)	Cum. OOIP (MMSTB)	Cum. REC. OIL (MMSTB)
1770	2233.3	10	0.14	4.23E+06	5.74	4.88	3.42	3.77	0.49	3.39	0.85
1780	2249.9	26.6	1.08	3.25E+07	44.06	37.45	26.22	28.96	3.75	26.04	6.51
1790	2266.6	43.3	2.06	6.19E+07	84.01	71.41	49.98	55.22	7.14	49.64	12.41
1800	2283.3	60	4.08	1.22E+08	165.98	141.08	98.76	109.11	14.11	98.08	24.52
1810	2300	76.7	8.86	2.66E+08	360.91	306.77	214.74	237.25	30.68	213.27	53.32
1820	2316.2	92.9	13.31	3.99E+08	541.83	460.56	322.39	356.18	46.06	320.19	80.05
1830	2331.5	108.2	18.26	5.48E+08	743.60	632.06	442.44	488.82	63.21	439.42	109.86
1840	2346.9	123.6	28.88	8.66E+08	1175.81	999.44	699.61	772.94	99.94	694.83	173.71

RISKED SALES GAS (PJ)	33.39
RISKED REC OIL (MMSTB)	6.25

Input Parameters	
Net Pay (m)	30
Porosity	0.25
Sh	0.75
Bg	205
Boi	1.47
Condensate (BBL's/MMSCF)	100
Recovery factor (gas)	0.85
Recovery factor (oil)	0.25
Sales factor (gas)	0.7

RISK	%
SOURCE GAS	60%
SOURCE OIL	50%
SEAL	30%
RESERVOIR	60%
STRUCTURE	40%
CHANCE OF SUCCESS GAS	4.32%
CHANCE OF SUCCESS OIL	3.60%

24/05/94

WARREGO.XLS

WARREGO - T/25P

EVCM Palaeocene

RESERVES CALCULATION (Simple Slab Model)

	Depth (m)	Vertical Closure (m)	Area (sq km)	Bulk Rock Volume (cubic m)	Cum. OGIP (BCF)	Cum. Raw Gas (BCF)	Cum. Sales Gas (BCF)	Cum. Sales Gas (PJ)	Cum. Condensate (MMSTB)	Cum. OOIP (MMSTB)	Cum. REC. OIL (MMSTB)
1870	2396.7	10	0.17	5.04E+06	6.51	5.53	3.87	4.28	0.55	3.63	0.91
1880	2413.4	26.7	0.67	2.00E+07	25.80	21.93	15.35	16.96	2.19	14.41	3.60
1890	2430	43.3	1.75	5.26E+07	67.92	57.73	40.41	44.65	5.77	37.92	9.48
1900	2447	60.3	4.17	1.25E+08	161.36	137.16	96.01	106.07	13.72	90.10	22.52
1910	2464	77.3	5.75	1.72E+08	222.65	189.25	132.48	146.36	18.93	124.32	31.08
1920	2484.9	98.2	7.04	2.11E+08	272.90	231.97	162.38	179.40	23.20	152.38	38.09
1930	2505.8	119.1	8.84	2.65E+08	342.48	291.11	203.78	225.14	29.11	191.23	47.81
1940	2524.5	137.83	10.60	3.18E+08	410.67	349.07	244.35	269.96	34.91	229.30	57.33
1950	2542.7	156	13.80	4.14E+08	534.68	454.48	318.14	351.48	45.45	298.55	74.64

RISKED SALES GAS (PJ)	21.09
RISKED REC OIL (MMSTB)	3.73

Input Parameters	
Net Pay (m)	30
Porosity	0.23
Sh	0.75
Bg	212
Boi	1.50
Condensate (BBL's/MMSCF)	100
Recovery factor (gas)	0.85
Recovery factor (oil)	0.25
Sales factor (gas)	0.7

RISK	%
SOURCE GAS	60%
SOURCE OIL	50%
SEAL	50%
RESERVOIR	50%
STRUCTURE	40%
CHANCE OF SUCCESS GAS	6.00%
CHANCE OF SUCCESS OIL	5.00%

24/05/94

491339

SAGASCO Resources Ltd.

T/25P – VERIDIAN WEAK LEAD TOP PALAEOCENE

146° 00'

40° 05'

40° 10'

40° 15'

POONBOON 1

VERIDIAN

PELICAN 3

TOURVILLE

5 cm

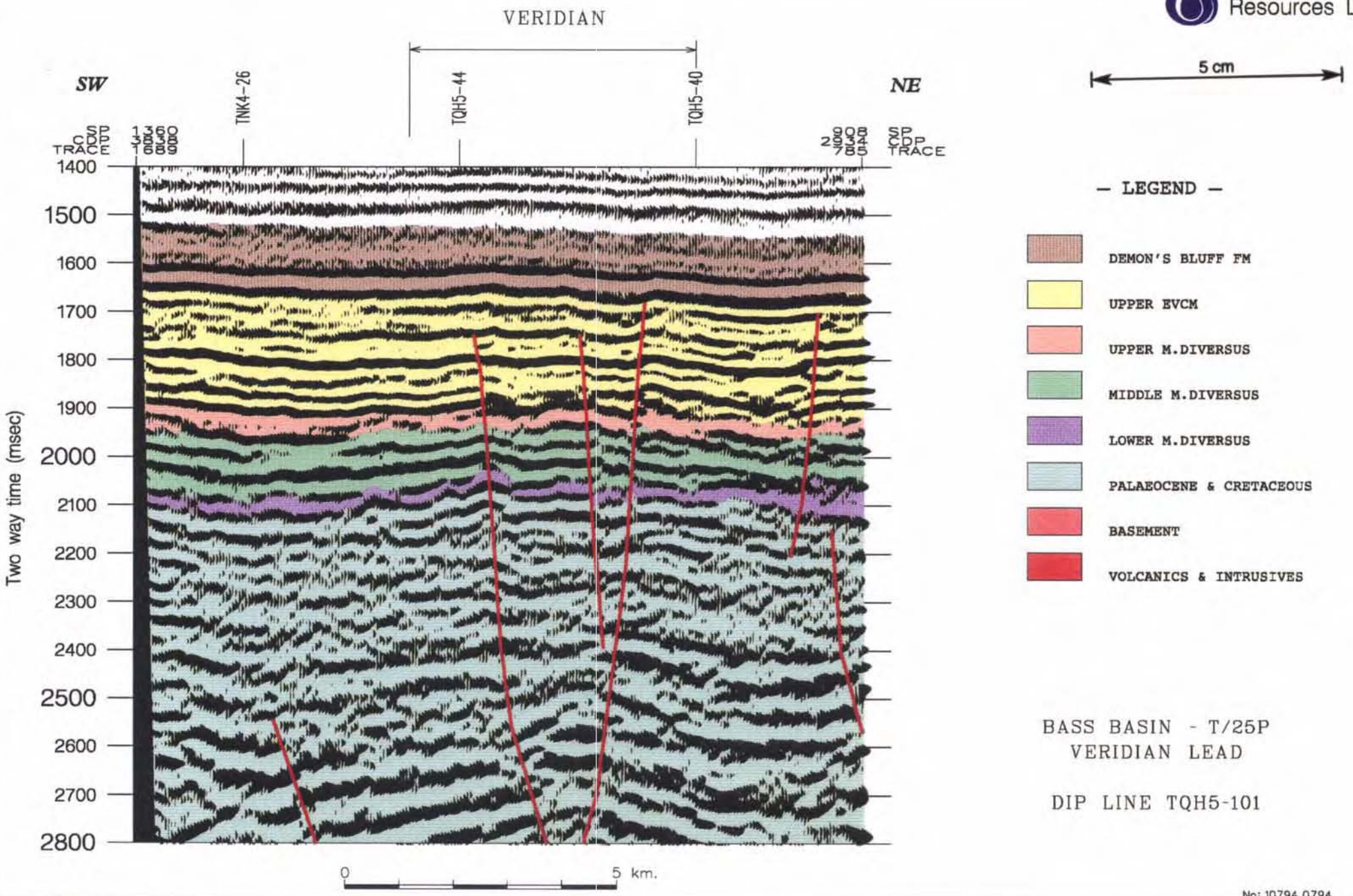
0 Km 6

146° 00'

No: 10688.0794 FIG. 11.70

491340

SAGASCO Resources Ltd.



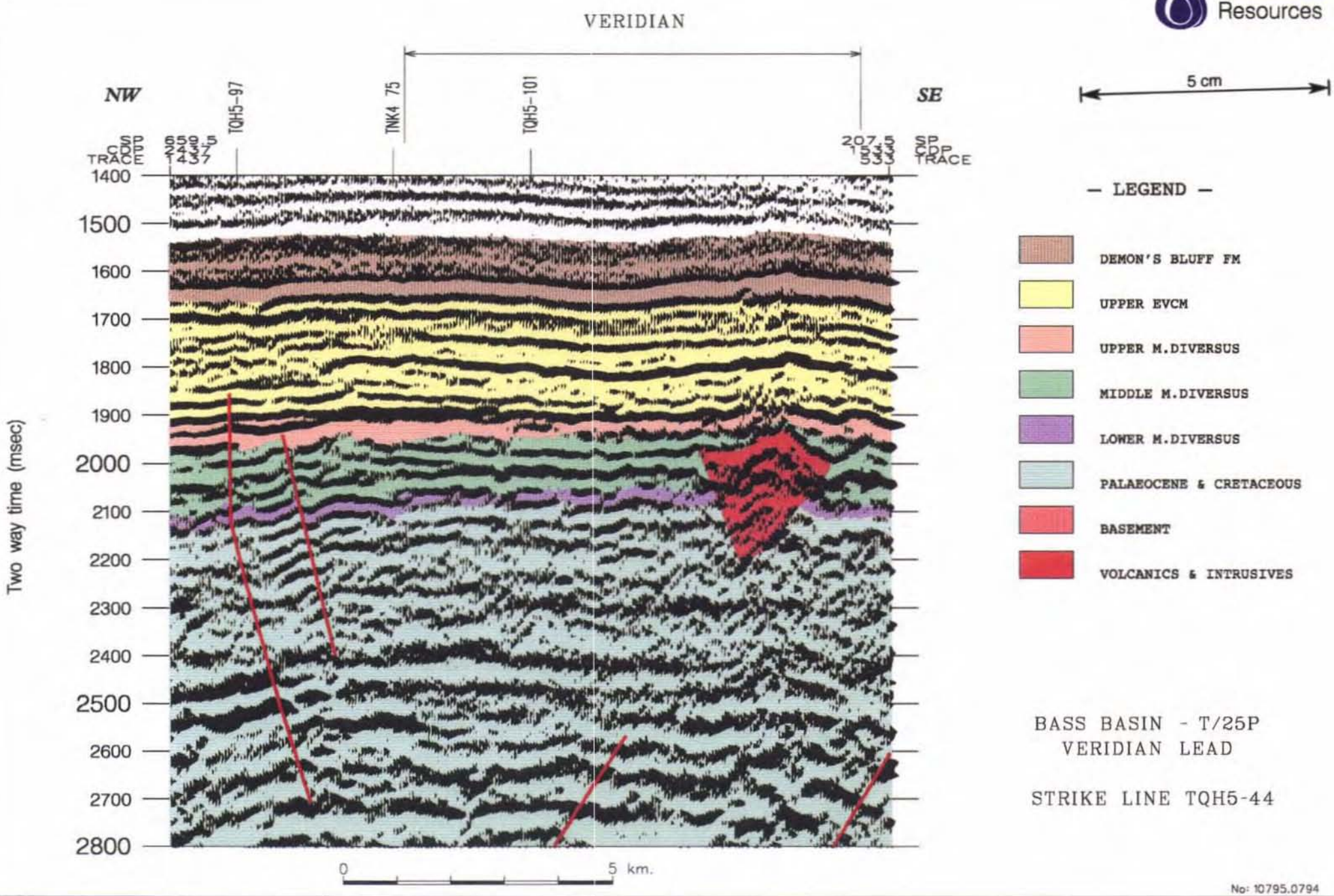
BASS BASIN - T/25P
VERIDIAN LEAD

DIP LINE TQH5-101

No: 10794.0794 FIG.11.71

491341

SAGASCO Resources Ltd.



BASS BASIN - T/25P
VERIDIAN LEAD

STRIKE LINE TQH5-44

No: 10795.0794 FIG. 11.72

PLAY CONCEPT SHEET

CATEGORY	Concept		
LOCATION	Southwest Ramp eg TQH5-145 (Figure 11.77)		
DESCRIPTION OF TRAP	(a) Subcrop of *M.diversus*, Palaeocene & Cretaceous units of the southwestern margin (b) Onlap of the Palaeocene & Late Cretaceous onto Early Cretaceous (c) Onlap of Palaeocene & Cretaceous sediments onto basement		
PRIMARY OBJECTIVES	EVCM - Middle *M.diversus* - Palaeocene - Cretaceous		
MAXIMUM CLOSURE	Unknown, potentially large		
DEPTH TO TOP RESERVOIR	Shallowest Middle *M.diversus*		1495mSS
	Shallowest Palaeocene		1460mSS
	Shallowest Cretaceous		1365mSS

DESCRIPTION OF RISK ELEMENTS

SOURCE

Potential source intervals for lateral migration of hydrocarbons in lower *M.diversus* and Palaeocene reservoirs are currently mid-mature for oil generation. For the deeper units the basement vitrinite reflectance map shows maturity to range from mid-mature for oil through to main gas generation. Source risk for gas is considered moderate at the *M.diversus* and Palaeocene levels and low for Cretaceous units. The source risk for oil is considered moderate at all levels.

RESERVOIR

The average porosity predicted for middle *M.diversus* and Palaeocene reservoirs could exceed 30%. Little is known about the reservoir characteristics of the Cretaceous sediments but the shallow burial should promote preservation of sandstone quality.

Reservoir risk is considered to be low.

SEAL

Sealing of traps is possible via various forms of pinchout summarised below:

(a)	Onlap trap	-	top seal provided by onlapping intraformational seals
		-	lateral seal provided by basement or shaly onlapped unit
(b)	Subcrop trap	-	top seal provided by shaly units deposited onto unconformity
		-	lateral seals provided by subcropped intraformational sealing units
(c)	Pinchout	-	updip sealing provided by a "shaled-out" condensed section
		-	lateral seals provided by intraformational sealing units

Sealing risk is presently unquantified and further study is necessary.

STRUCTURE

The concept is currently based on a regionally spaced suite of dip lines. Further data is needed to formulate formal leads and prospects. Basinward sagging of these sediment wedges has occurred continuously throughout the Basin's history and should provide ample opportunity for hydrocarbon migration and accumulation at the basin edge.

ADDITIONAL WORK REQUIREMENTS

Further mapping of these concepts is necessary but a good quality seismic grid is required for prospect and lead development.

491344

SAGASCO Resources Ltd.

T/25P – WARREGO LEAD TOP PALAEOCENE

146° 00'

146° 05'

40° 15'

40° 20'

40° 25'

5 cm

ACTAEON

WARREGO

SURVILLE

TOMAHAWK

0 Km 6

No: 10689.0794 FIG.11.73

491345

SAGASCO Resources Ltd.

T /25P – WARREGO LEAD TOP MID *M.DIVERSUS*

140° 55'

146° 00'

40° 15'

40° 20'

40° 25'

VACANT

T /25P

TOURVILLE

WARREGO

ACTAEON

EDDYSTONE

SURVILLE

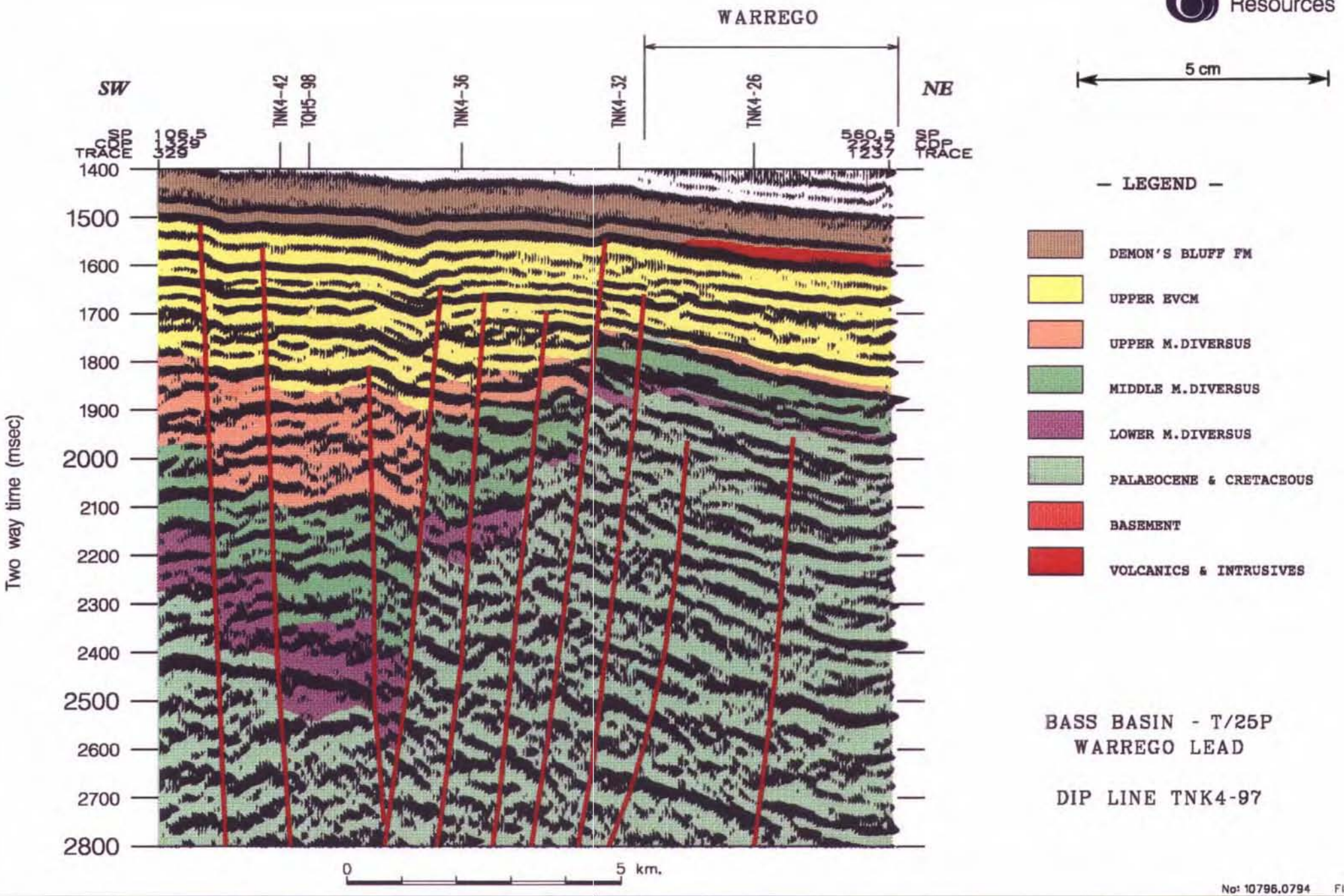
5 cm

0 Km 6

No: 10665.0794 FIG. 11.74

491346

SAGASCO Resources Ltd.



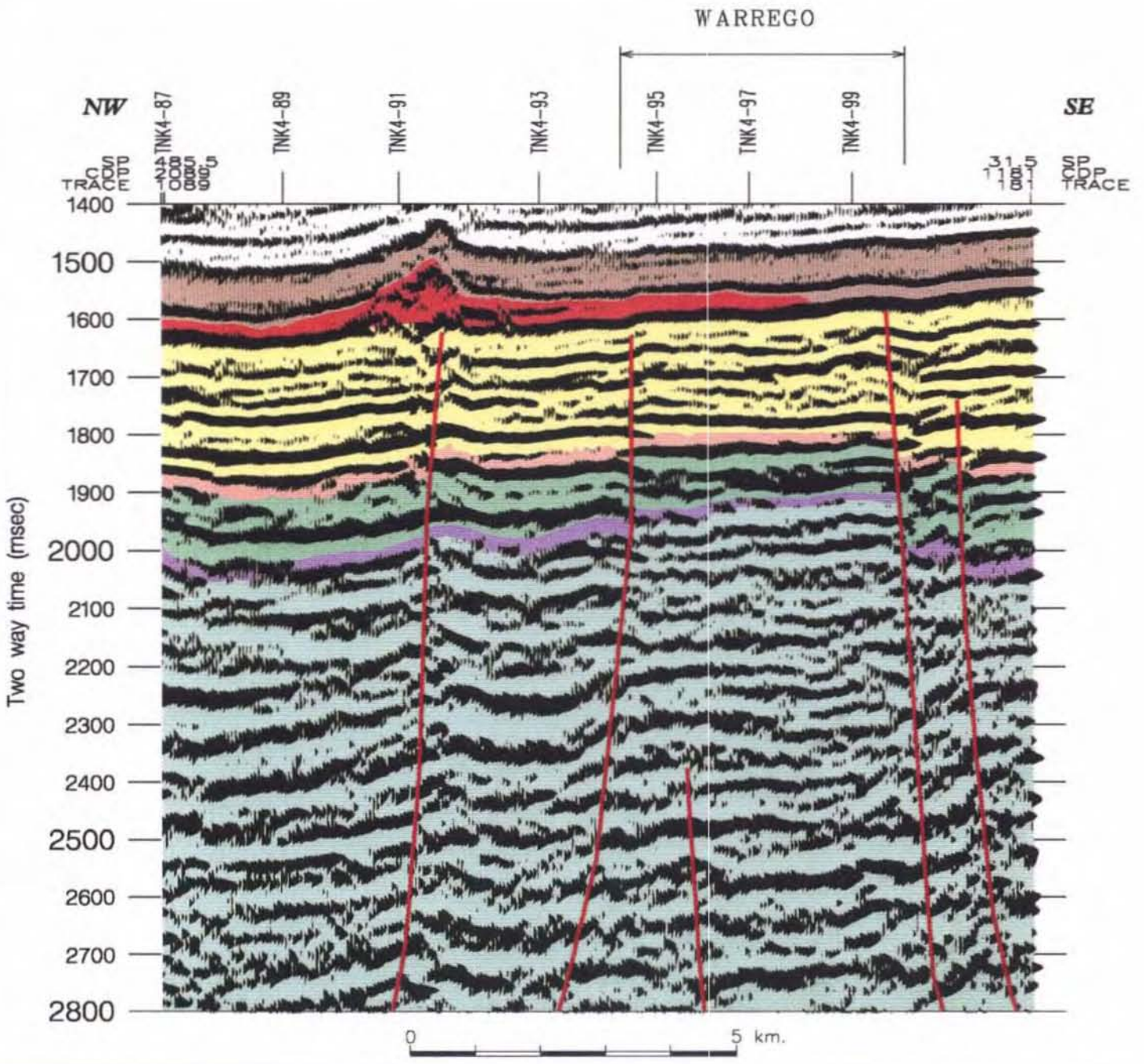
BASS BASIN - T/25P
WARREGO LEAD

DIP LINE TNK4-97

No: 10796.0794 FIG. 11.75

491347

SAGASCO Resources Ltd.



5 cm

— LEGEND —

- DEMON'S BLUFF FM
- UPPER EVCM
- UPPER M.DIVERSUS
- MIDDLE M.DIVERSUS
- LOWER M.DIVERSUS
- PALAEOCENE & CRETACEOUS
- BASEMENT
- VOLCANICS & INTRUSIVES

BASS BASIN - T/25P
WARREGO LEAD

STRIKE LINE TNK4-26

No: 10797.0794 FIG. 11.76

491348

SAGASCO Resources Ltd.

PINCHOUT LEAD

SW

NE

TQH5-102

TQH560-1

TNK4-95 / S92A-102

S92A-121

S92A-104

S92A-123

S92A-106

SP 591 CDP 2300 TRACE 1300

124 874 CDP 2664 TRACE 1884

628 SP 372 CDP 1372 TRACE

Two way time (msec)

700 800 900 1000 1100 1200 1300 1400 1500 1600 1700 1800 1900 2000 2100 2200 2300 2400 2500 2600 2700 2800 2900 3000 3100 3200 3300

TQH5-145

TNK4-95

— LEGEND —

DEMON'S BLUFF FM

UPPER EVCM

UPPER M.DIVERSUS

MIDDLE M.DIVERSUS

LOWER M.DIVERSUS

UNDIFFERENTIATED PALAEOCENE & CRETACEOUS

BASEMENT

VOLCANICS & INTRUSIVES

Ø 5km.

5 cm

BASS BASIN - T/25P
BASIN EDGE PINCHOUT LEAD

LINES TQH5-145 / TNK4-95

No: 10809.0794 FIG.11.77

12 FUTURE EXPLORATION STRATEGY

The prospectivity of T/25P has been enhanced by this project with several new, large leads being identified and mapped. Some of the more attractive leads were targeted by the 1994 Rocky Cape Seismic Survey and will be interpreted third quarter 1994.

Reservoir studies demonstrate that fair to good sandstone quality can be expected for the mapped leads, and the studies highlighted areas of better reservoir development such as the Poonboon Platform which could be pursued in future exploration.

Mapping and maturity studies showed that a large portion of the permit has generative source rocks at depth, and given robust trap and reservoir development hydrocarbon accumulations should occur in various units below the middle *M.diversus* Unconformity.

Kerogen transformation studies show that hydrocarbon expulsion occurred from mature source rocks of the lower *M.diversus*, Palaeocene and Late Cretaceous after the development of all of the leads identified except the Hunter top EVCM and upper *M.diversus* culmination. Therefore the risks associated with sourcing of the mapped middle *M.diversus* and Palaeocene leads appears reasonable.

Following the interpretation of the 1994 Rocky Cape Survey it is expected that the prospects and leads inventory will include six or seven robust structures at middle *M.diversus* and Palaeocene levels which exceed 300 PJ Sales Gas capacity with several of these being over 600 PJ volume. The standout structure of the inventory is the Clarke Lead which straddles the T/18P border. This lead can contain 4626 PJ Sales Gas at middle *M.diversus* level and 2276 PJ at Palaeocene level.

REFERENCES

Abele, C., 1976. Central Coastal Basin : In Douglas J.G. & Ferguson, J.A. (Eds) - Geology of Victoria : Geol.Soc.Aust.Spec.Publ. No 5, p 229-248.

AMOCO Australia, 1987. Hydrocarbon Source Rock Evaluation - Bass Basin. Analabs.

Aquing, F.H., 1980. Geology of the Eastern View Coal Measures - Bass Basin. MSc thesis, Macquarie University.

Baillie, P.W., Bacon, C.A., 1989. Integrated Sedimentological Analysis: The Eocene of the Bass Basin. APEA Journal, 29 (1), 312-327.

Baillie, P.W., Tingate, P.R., and Stuart, W.J. (1991) Reservoir Development and Diagenesis in the Bass Basin, Tasmania. APEA Journal, 31 (1), 85-100.

Briguad, F., and Vasseur, G., 1989. Mineralogy, porosity and fluid control on thermal conductivity of sedimentary rocks. *Geophysical Journal*, v.98, 525-542.

Brown, B.R., 1976. Bass Basin - Some Aspects of the Petroleum Geology In Leslie, R.B., Evans, G.J. and Knight, G.L. (Eds) Petroleum - Monograph No.7. In Economic Geology of Australia and Papua New Guinea p 67-82 Australasia Institute of Mining and Metallurgy.

Burrett, C.F. and Martin, E.L., (Eds) 1989. Geology and Mineral Resources of Tasmania : Geol.Soc.Aust.Spec.Publ No.15, 1989.

Cubitt, C., 1992. Diagenetic Controls and Reservoir Evaluation of the Eastern View Group, Bass Basin, Tasmania, Australia. BSc Honours thesis, National Centre for Petroleum Geology and Geophysics.

Davidson, J.K., 1980. Rotational Displacements in Southeastern Australia and their Influence on Hydrocarbon Occurrence - Orthodoxy and Creativity on the Frontiers of Earth Sciences: Tectonophysics, V.63, p 139-153.

Etheridge, M.A., Bronson, J.C., and Stuart-Smith, P.G. (1985) Extensional Basin - Forming Structures in Bass Strait and their Importance for Hydrocarbon Exploration. APEA Journal 1985 p 344-361.

Falvey, D.A. and Mutter, J.C., 1981. Regional Plate Tectonics and Evolution of Australia's Passive Continental Margins: BMR Journal, V.6, p 1-29.

Falvey, D.A., and Middleton, M.F., 1981. Passive Continental Margins: Evidence for a Pre-break-up Deep Crustal Metamorphics Subsidence Mechanism. *Oceanologic Acta,* SP, 103-114.

Lowry, D.C. and Longley, I.M., 1991. A New Model for the Mid-Cretaceous Structural History of the Northern Gippsland Basin. APEA Journal p 143-153.

Katz, B.J., Pheifer, R.N., and Schunk, D.J., 1988. Interpretation of Discontinuous Vitrinite Reflectance Profiles. *AAPG* v.72 no 8. p926-931.

Lopatin, N.V., 1971. Temperature and Geologic Time as Factors in Coalification. *Izvestiya Akademii Nauk USSR, Seriya Geologicheskaya*, no 3. p95-106.

Meszoly, G.F.J., Bodard, J.M., and Wall, V.J., 1986. Diagenesis and Porosity Development in the Eastern View Group, Bass Basin. 303-315. In: Glenie, R.C. (Ed.), Second South-Eastern Australia Oil Exploration Symposium, Petroleum Exploration Society of Australia Symposium, Melbourne 1985.

Morgan, R., 1985. Palynology Review of Previous Oil Drilling, Bass Basin, Australia. Prepared for Amoco Australia (unpublished).

Peacock, D.C.P. and Sanderson, D.J., 1994. Geometry and Development of Relay Ramps in Normal Fault Systems. AAPG Bulletin, V.78, No.2 (February 1994), p 147-165.

Platte River Associates, Inc., 1989. BasinMod™, Basin Modelling Systems Manual.

Sclater, John G. and Christie, P.A.F., 1980. Continental Stretching: An Exploration of the Post-Mid-Cretaceous of the Central North Sea Basin, *Journal of Geophysical Research*, v 85, 3711-3739.

Smit, R., 1988. A New Tectonic Model for the Bass Basin. ASEG/SEG Conference - Adelaide, 1988.

Suttill, R.J., Williams, B.P.J., and Wild, E.K., 1987. Sedimentological Analysis of Bass Basin Cores - Final Project Report, Internal Company Report South Australian Oil and Gas Corporation Pty Ltd (now SAGASCO Resources Ltd).

Tissot, B.P., and Welte, D.W., 1978. Petroleum Formation and Occurrence: Springer Verlag. New York.

Waldron, A.R., 1986. Bass Basin Hydrocarbon Shows. SAOG Company Report (Unpubl).

Waples, D.W., 1980. Time and Temperature in Petroleum Formation: Application of Lopatin's Method to Petroleum Exploration. *AAPG Bulletin*, v.64, 916-926.

Waples, D.W., 1981. (Ed) "Time & Temperature as factors in Oil Generation" In Organic Geochemistry for Exploration Geologists. Burgess Publishing Company CEPCO Division. Chapter 8 (p 95-106).

Van Hinte, J.E., 1978. Geohistory Analysis-Application of Micropaleontology in Exploration Geology. AAPG V.62. No.2 p 201-222.

Zampatti, D., 1991. Diagenesis of Eastern View Group Sediments Bass Basin, Tasmania. BSc thesis, University of Adelaide.

Well Completion Reports for the following wells: Pelican 1-5, Flinders 1, Pipipa 1, Poonboon 1, Narimba 1, Yolla 1, King 1, Cormorant 1, Aroo 1, Tarook 1, Nangkero 1, Dondu 1, Tilana 1 (Unpublished company reports).

APPENDIX 1

WELL SUMMARY & POST MORTEM SHEETS

GWF9107.009-RJS

WELL SUMMARY AND POST MORTEM

WELL: Pelican 1 **OPERATOR:** Esso **PERMIT:** T/P6

LOCATION: Lat: 40° 20' 20.8"S Long: 145° 50' 37.1"E

SPUD: 19 March 1970 **RIG RELEASE:** 1 May 1970

TD: 3178.5m **KB:** 30.48m **WATER DEPTH:** 76.5m

DRILLING RIG: Ocean Digger **STATUS:** Gas/Cond Discovery, P&A

STRUCTURE: Pelican 1 is located on a fault segment of the highly faulted Pelican anticline. At the time of drilling the location was selected on the basis of faulted closure at the "uppermost" *M.diversus* level. Current mapping indicates that the well is within closure at the top of the middle *M.diversus* level. No closure occurs at the top of the Eastern View Coal Measures at this location.

STRATIGRAPHY:

	KB(M)	SS(M)
Torquay Group	107.0	-76.5
Demons Bluff Fm	1635.2	-1604.7
EVCM	1755.6	-1725.2
M.M.diversus	2449.1	-2418.6
L.balmei	3113.5	-3083.1
TD (upper *L.balmei*)	3178.5	-3148.0

DRILLING DATA:

Hole Size (")	Depth (m:KB)
17½	777.2
12¼	2612.1
8½	3178.5
Casing Size (")	**Depth (m:KB)**
20	263.7
13⅜	765.7
9⅝	2603.0

DRILLING: No drilling problems related to the geology were reported.

CORES: Ten cores were cut as follows:

1	1706.9 - 1716.0m	Rec	9.1m	Demons Bluff Fm
2	1780.0 - 1786.4m	Rec	6.4m	Basal Demons Bluff Fm
3	2167.1 - 2173.2m	Rec	6.1m	EVCM - *P.asperopolus*
4	2361.9 - 2370.4m	Rec	8.5m	EVCM - upper *M.diversus*
5	2546.3 - 2555.4m	Rec	9.1m	EVCM - middle *M.diversus*
6	2603.0 - 2612.1m	Rec	9.1m	EVCM - middle *M.diversus*
7	2823.4 - 2829.5m	Rec	6.1m	EVCM - middle *M.diversus*
8	2873.0 - 2882.2m	Rec	8.5m	EVCM - lower *M.diversus*
9	3065.7 - 3074.8m	Rec	9.1m	EVCM - lower *M.diversus*
10	3165.7 - 3169.3m	Rec	3.7m	EVCM - upper *L.balmei*

GWF9107.009-RJS

SWC: 135 cores were attempted between 271.3 - 3161.4m
127 were recovered.

TESTS: 21 FITs were performed as listed below, no drill stem tests were performed.

FIT 1 2608.2m (8557')
Failed.

FIT 2 2585.9m (8484')
REC: 118 cubic feet Gas
+2500 cc Condensate
+7500 cc Mud Filtrate.
FSIP = 3710 psi
FS = 3549 psi
HP = 4640 psi

FIT 3 2550.3m (8367')
REC: 108.2 cubic feet Gas
+ 3250 cc Condensate
FSIP = 3530 psi
FP = 3040 psi
HP = 4360 psi

FIT 4 2480.5m (8138')
REC: 21,500 cc Mud Filtrate
FSIP = 3660 psi
FP = 3533 psi
HP = 4357 psi

FIT 5 2473.5m (8115')
REC: 26.5 cubic feet Gas
+ 1000 cc Condensate
+ 1000 cc Mud Filtrate
(chamber plugged?)
FSIP = 3596 psi
FP = 62 psi
HP = 4347 psi

FIT 6 2595.4m (8515')
REC: 125 cc Mud Filtrate
FSIP = 3600 psi
FP = 0 psi
HP = 4480 psi

FIT 7 3160.m (10,368')
REC: Mud, Failed

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FIT 8 — 3161.4m (10,372')
REC: 37.5 cubic feet Gas
+ 550 cc Condensate
FSIP = 6114 psi
FP = 409 psi
HP = 6202 psi

FIT 9 — 3058.1m (10,033')
REC: Mud, Failed

FIT 10 — 3061.7m (10,045')
REC: Mud, Failed

FIT 11 — 3004.7m (9,858')
REC: 4800 cc Mud Filtrate
FSIP = 5100 psi
FP = 300 psi
HP = 5950 psi

FIT 12 — 2887.7m (9474')
REC: 21,000 cc Mud Filtrate
FSIP = 4575 psi
FP = 160 psi
HP = 5709 psi

FIT 13 — 3060.5m (10,041')
REC: 3.2 cubic feet Gas
+ 21,000 cc Mud Filtrate
+ trace condensate
FSIP = 5191 psi
FP = 280 psi
HP = 6015 psi

FIT 14 — 2871.8m (9422')
REC: Mud, Plugged

FIT 15 — 2872.4m (9424')
REC: 0.4 cubic feet Gas
+ 1000 cc Mud Filtrate
FSIP = 4311 psi
FP = 41 psi
HP = 5057 psi

FIT 16 — 2858.4m (9378')
REC: 3500 cc Mud Filtrate
FSIP = 4326 psi
FP = 50 psi

FIT 17 2794.1m (9167')
REC: 1750 cc Mud Filtrate
FSIP = 4145 psi
FP = 36 psi
HP = 4891 psi

FIT 18 2775.8m (9107')
REC: 230 cc Mud Filtrate
FSIP = Not reported
FP = 10 psi
HP = 4865 psi

FIT 19 2738.6m (8985')
REC: 69.8 cubic feet Gas
+ 1000 cc Condensate
+ 1750 cc Mud Filtrate
FSIP = 3948 psi
FP = 3653 psi
HP = 4756 psi

FIT 20 2633.5m (8640')
REC: 2200 cc Mud Filtrate
FSIP = 3855 psi
FP = 2818 psi
HP = 4616 psi

FIT 21 2550.3m (8367')
REC: = 139 cubic feet Gas
+ 6000 cc Condensate
FSIP = 3684 psi
FP = 3647 psi
HP = 4450 psi

SHOWS: Background gas (methane, ethane and minor propane) were recorded through the Eastern View Coal Measures to approximately 2470m with peaks associated with coals. Below 2470m gas peaks (up to pentane) are recorded from sandstones belonging to the middle and lower *M.diversus* palynological zones. Also reported from these sandstones are numerous shows of good fluorescence and good cut.

RESERVOIR: Excellent quality sandstone reservoirs occur in the upper EVCM above the middle *M.diversus* palynological zone. Sandstones belonging to the lower to middle *M.diversus* palynological zones have log derived average effective porosities of 17-23% (Amoco report: Pelican Field Reserves). Core analysis data supports the log derived porosities and shows a wide variation in permeabilities which range from 1-400 md.

Facies analyses of core conclude that the sandstones of the lower to middle *M.diversus* zones were deposited in deltaic, fluvial and lacustrine environments and typically comprise fluvial channel fills and shoreface sandstones.

MATURITY: The maximum mean vitrinite reflectance of 0.86% recorded in Pelican 1 was near total depth at 3167.5m in the upper *L.balmei* sediments which are therefore near peak maturity for oil. The start of the oil window occurs at approximately 2600m (0.7% vitrinite reflectance), near the top of the middle *M.diversus* zone reservoir section.

SOURCE ROCK: A sequence of eight samples between 1783.3m and 3074.2m (upper EVCM to lower *M.diversus*) yielded total organic carbon contents of 0.63% for a light brown silty clay to 58.40% for a coal. Detailed analyses were undertaken on three samples, 1783.3m light brown silty clay, 2170.8m a very dark coaly shale or shaly coal, and at 2825.2m a dark laminated shale.

The light brown silty clay (1783.3m) has poor genetic potential (0.8mg/g) a low hydrogen index of 73 and a TMax. of 405 (immature). The very dark coaly shale (2170.8m) had a high generic potential of 67.28 mg/g, a hydrogen index of 225 and was marginally to moderately mature. The dark laminated shale has a moderate source rock potential and a hydrogen index indicative of gas and some oil generation.

Total extracts yielded are fair for sample 1783.3, very high for 2170.8m and good for 2825.2m. The coaly sample at 2170.8m is believed to contain migrated hydrocarbons as indicated by the high amount of total extract at a relatively moderate level of maturity.

Samples from 1783.3m and 2170.3m are rich in aromatics indicative of a coaly source and both have a high pristane/phytane ratio indicating a land plant origin for the kerogen.

POST MORTEM: Pelican 1 established the presence of excellent quality reservoirs in the upper EVCM, but they were water bearing.

In the lower to middle *M.diversus* zone condensate charged reservoirs were encountered within closure with good porosity. The deliverability characteristics of these reservoirs was not established by testing and the disappointing results from equivalent zones at Pelican 5 are cause for concern.

Recent mapping confirms the presence of closure at Pelican 1 and shows that this has existed since the Late Cretaceous but was enhanced possibly at the end of Upper *M.diversus* deposition and also after Miocene compressional tectonics. Closure at the reservoir level may be due to, in part, lowside fault trapping.

Due to its low hydrocarbon maturity it appears that the accumulation was the result of vertical migration from Late Cretaceous source rocks.

Maturity and source rock data from Pelican 1 together with the gas-condensate recoveries from FITs established the Pelican half graben as a major hydrocarbon source kitchen.

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WELL SUMMARY AND POST MORTEM

WELL: Pelican 2 **OPERATOR:** Esso **PERMIT:** T/P5

LOCATION: Lat: 40° 18' 28.426"S Long: 145° 49' 12.27"E

SPUD: 28 July 1970 **RIG RELEASE:** 7 September 1970

TD: 3068.1m **KB:** 30.48m **WATER DEPTH:** 77.7m

DRILLING RIG: Ocean Digger **STATUS:** Gas/Cond Appraisal, P&A

STRUCTURE: Pelican 2 is located 4km to the northwest of Pelican 1 on a separate fault closed segment of the Pelican anticline. Current mapping indicates fault dependant closure at the middle *M.diversus* and *L.balmei* levels. No closure is mapped at the top of the Eastern View Coal Measures at this location.

STRATIGRAPHY:

	KB(M)	SS(M)
Torquay Group	108.2	-77.7
Demons Bluff Fm	1674.6	-1644.1
EVCM	1794.7	-1764.2
M.M.diversus	2533.0	-2502.5
TD (lower *M.diversus*)	3068.1	-3037.6

DRILLING DATA:

Hole Size (")	Depth (m:KB)
12¼	3068.1

Casing size (")	Depth (m:KB)
20	264.3
13⅜	9092

DRILLING: No drilling problems related to the geology were reported.

CORES: Three cores were cut as follows:

1	2923.9 - 2932.2m	Rec	6.7m	EVCM middle *M.diversus*
2	2981.6 - 2990.7m	Rec	9.1m	EVCM lower-middle *M.diversus*
3	3017.8 - 3027.0m	Rec	9.1m	EVCM lower *M.diversus*

SWC: 89 cores were attempted between 944.9 - 3066.3m
80 were recovered.

TESTS: 11 FITs were performed as described below, no drill stem tests were performed.

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FIT 1-1 2879.5m (9447')
REC: 37 cubic feet Gas
+ 750 cc Condensate
+ 13,000 cc Mud Filtrate
FSIP = 4316 psi
FP = 407 psi
HP = 5300 psi

FIT 1-2 2828.3m (9312')
REC: 100 cc Mud
FSIP = 0 psi
FP = 57 psi
HP = 4986 psi

FIT 2-1 2788.6m (9149')
REC: 1.0 cubic feet Gas
+ 3800 cc Mud Filtrate
+ trace oil
FSIP = 4094 psi
FP = 57 psi
HP = 4800 psi

FIT 3-1 3050.1m (10,007')
REC: 50 cc Mud
FSIP = 0 psi
FP = 63 psi
HP = 5300 psi

FIT 3-2 2982.2m (9784')
REC: 50 cc Mud
FSIP = Not reported
FP = 26 psi
HP = 5182 psi

FIT 3-3 3019.3m (9906')
REC: 0.4 cubic feet Gas
+ 2100 cc Mud Filtrate
FSIP = 4997 psi
FP = 0 psi
HP = 5254 psi

FIT 3-4 2958.4m (9706')
REC: 3.7 cubic feet Gas
+ 16,300 cc Mud Filtrate
FSIP = 4377 psi
FP = 330 psi
HP = 5130 psi

FIT 3-5 3049.8m (10,006')
REC: 50 cc Mud
FSIP = 200 psi
FP = 200 psi
HP = 5300 psi

FIT 3-6 2982.5m (9785')
REC: 0.6 cubic feet Gas
+ 3400 cc Mud Filtrate
FSIP = 4796 psi
FP = 195 psi
HP = 5091 psi

FIT 3-7 3018.7m (9904')
REC: 1.7 cubic feet Gas
+ 3400 Mud Filtrate
FSIP = 4995 psi
FP = 40 psi
HP = 5219 psi

FIT 3-8 2982.2m (9784')
REC: 0.6 cubic feet Gas
+ 5300 Mud Filtrate
FSIP = 4824 psi
FP = 48 psi
HP = 5095 psi

SHOWS: Background gas (methane and ethane) were recorded through the Demons Bluff Fm and the upper EVCM to the top of the middle *M.diversus* zone at 2533m. In sandstones of the lower to middle *M.diversus* zone several gas peaks were recorded with butane recorded on the gas chromatograph. These shows which were often accompanied by fluorescence continued to total depth.

RESERVOIR: Pelican 2 had similar reservoir distribution and quality to that encountered in Pelican 1. In particular Pelican 2 established that some of the thicker sandstones penetrated in the lower to middle *M.diversus* zone at Pelican 1, extended between the two wells.

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MATURITY: The maximum mean vitrinite reflectance of 0.82% was recorded near total depth at 3020.9m and is in agreement with the maturity profile established for Pelican 1.

SOURCE ROCK: There is no source rock data for samples from Pelican 2, see reports of detailed analyses conducted on the nearby Pelican 5.

POST MORTEM: Pelican 2 confirmed the presence of the gas condensate charged reservoirs in the lower to middle *M.diversus* zone discovered in Pelican 1, on a separate fault block at the northern edge of the Pelican anticline.

GWF9107.009-RJS

WELL SUMMARY AND POST MORTEM

WELL: Pelican 3 **OPERATOR:** Esso **PERMIT:** T/6P

LOCATION: Lat: 40° 15' 44.99"S Long: 145° 51' 50.60"E

SPUD: 1 May 1972 **RIG RELEASE:** 13 June 1972

TD: 2906.9m **KB:** 9.75m **WATER DEPTH:** 80.2m

DRILLING RIG: Glomar Conception **STATUS:** Gas shows, P&A

STRUCTURE: Pelican 3 is located on the high north eastern side of the major bounding fault to the Pelican half graben, it is therefore not located on the Pelican anticlinal feature where Pelican 1, 2, 4 and 5 were drilled. The well is located on a fault dependant closure at the middle *M.diversus* and *L.balmei* levels and near the crest of a fault independent closure at the top of the Eastern View Coal Measures.

STRATIGRAPHY:

	KB(M)	SS(M)
Torquay Group	90	-80.2
Demons Bluff Fm	1667	-1657
EVCM	1788	-1778
M.M.diversus	2289	-2279
L.balmei	2416	-2406
TD (lower *L.balmei*)	2906.9	-2897.2

DRILLING DATA:

Hole size (")	Depth (m:KB)
12¼	2906.9
Casing size (")	**Depth (m:KB)**
20	237.1
13⅜	923.2
9⅝	2897.1

DRILLING: Abnormal pressure was encountered at approximately 2560m.

CORES: Three cores were cut as follows:

1	2850.2 - 2864.5m	Rec	14.3m	EVCM - lower *L.balmei*
2	2864.5 - 2883.4m	Rec	18.9m	EVCM - lower *L.balmei*
3	2883.4 - 2902.0m	Rec	18.6m	EVCM - lower *L.balmei*

SWC: 60 cores were attempted between 975.3 - 2814.8m
48 were recovered.

TESTS: A production test over the interval 2799.3 - 2817.3m recovered formation water after reverse circulating, with minor gas at a rate too small to measure. In addition 16 FITs were run as described below:

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FIT 1	2801.4m Lost seal, Recovered mud
FIT 2	2801.1m Nil recovery, tight
FIT 3	2826.4m Nil recovery, tight
FIT 4	2870.6m REC 0.4 cubic feet Gas + 2100 cc water FSIP = 5143 psi HP = 5325 psi
FIT 5	2872.7m Nil recovery, lost seal, tight
FIT 6	2871.5m REC 22,000 cc Mud FSIP = 5252 psi HP = 5315 psi
FIT 7	2895.0m Nil recovery tight
FIT 8	2814.8m Nature of recovered fluids not identified ISIP = 5067 psi FSIP = 4965 psi HP - 5534 psi
FIT 9	2872.7m REC 0.7 cubic feet gas + 7000 cc water ISIP = 5250 psi HP = 5753 psi
FIT 10	2815.4m REC 100 c water + trace mud, tight test
FIT 11	2800.2m Rec mud, no seal
FIT 12	2779.5m Nil recovery, no seal

FIT 13	2814.5m Nature of recovered fluids not identified ISIP = 5000 psi FSIP = 4900 psi HP = 5700 psi
FIT 14	2872.4m Tool failure
FIT 15	2872.4m Nature of recovered fluids not identified FSIP = 5248 psi HP = 5759 psi
FIT 16	273.3m Nil recovery, tight ISIP = 4455 psi HP = 5459 psi

SHOWS: Minor gas shows were reported during drilling in the Palaeocene over the interval 2778 - 2820m and weak shows of fluorescence occurred in cores 1 to 3 over the interval 2850.2 - 2902m. FITs and production testing recovered only minor gas from these zones.

RESERVOIR: Core analysis results from cores 1, 2 and 3 indicate reservoir quality in the Palaeocene abnormally pressured zone is poor with porosities in the range 8 - 23% and typical permeabilities of less than 2 millidarcies.

MATURITY: Only two vitrinite reflectance determinations have been made from samples from Pelican 3. Both samples are from near total depth and give a mean vitrinite reflectance range of 0.67 - 0.71% indicating the sediments are near the onset of the oil mature window.

SOURCE ROCK: Total organic carbon contents were determined for three samples at 2861.0, 2877.0 and 2891.0m giving values of 2.86, 1.50 and 1.42% respectively. The richest sample, at 2861.0m, a grey laminated shale was investigated further. Rock Eval results classify this sample as a moderate source rock, with a fairly low hydrogen index of 84 and a moderate maturity level (TMax 434). The sediment yielded a good amount of total extract which was rich in aromatic hydrocarbons.

Terrestrial origin is indicated by odd - even predominances of the C_{25}+ n-alkanes, a low $(C_{21}+C_{22})/(C_{28}+C_{29})$ ratio, low C_{27}/C_{29} diasterane and sterane ratios and the presence of eudesmane and diterpanes.

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POST MORTEM: Pelican 3 established that the lower to middle *M.diversus* palynological zone sediments that contained gas condensate charged reservoirs in Pelican 1 and 2 had thinned considerably over the Pelican 3 structure. Palynological age dating established that the *M.diversus* sequence had thinned from 850m over the Pelican structure to 186m at Pelican 3.

The absence of hydrocarbons in the good quality *M.diversus* and Palaeocene sandstones is interpreted to be due to the juxtaposition of these reservoirs with high porosity high permeability sandstones of the *M.diversus* and *P.asperopolus* zones across the fault which forms the southwestern limit of closure.

GWF9107.009-RJS

WELL SUMMARY AND POST MORTEM

WELL: Poonboon 1 **OPERATOR:** Esso **PERMIT:** T/P6

LOCATION: Lat: 40° 08' 15.19"S Long: 145° 55' 01.29"E

SPUD: 29 August 1972 **RIG RELEASE:** 2 October 1972

TD: 3265.9m **KB:** 9.75m **WATER DEPTH:** 78.9m

DRILLING RIG: Glomar Conception **STATUS:** Gas shows, P&A

STRUCTURE: Poonboon 1 was drilled on the crest of a low relief closed anticlinal feature. Closure was mapped at all levels in the Eastern View Coal Measures above the *L.balmei* palynological zone.

STRATIGRAPHY:

	KB(m)	SS(m)
Torquay Group	88.7	-78.9
Demons Bluff Fm	1755	-1745
EVCM	1892	-1882
M.M.diversus	2384	-2374
L.balmei	2684	-2674
TD (*T.longus*)	3265.9	-3256.1

DRILLING DATA:

Hole size (")	Depth (m:KB)
12¼	2690.5
8½	3265.9

Casing size (")	Depth (m:KB)
20	219.5
13⅜	924.2
9⅝	2670.4

DRILLING: Abnormal pressure was encountered at approximately 2830m. Pore pressure increased to TD at 3265.9m where drilling had to be stopped.

CORES: Five cores were cut as follows:

1	1952.9 - 1960.5m	Rec 7.3m	EVCM - middle *N.asperus*
2	2467.6 - 2474.4m	Rec 6.7m	EVCM - middle *M.diversus*
3	2682.8 - 2690.5m	Rec 7.6m	EVCM - upper *L.balmei*
4	3034.0 - 3042.5m	Rec 8.5m	EVCM - lower *L.balmei*
5	3258.6 - 3265.9m	Rec 7.3m	EVCM - *T.longus*

SWC: 103 cores were attempted between 941.2 - 3258.9m
91 were recovered.

TESTS: 8 FITs were performed as listed below, no drill stem tests were performed.

FIT 1 2670.1m
REC 0.1 cubic feet Gas
+ 400 cc water
FSIP = 3680 psi
HP = 4480 psi

FIT 2 3180.3m
REC 1.4 cubic feet Gas
+ 2200 water
FSIP = 5700 psi
HP = 6200 psi

FIT 3 3103.2m
REC 1000 cc water
Lost pad seal
HP = 6200 psi

FIT 4 2964.8m
REC 2200 cc water
FSIP = 4500 psi
HP = 5800 psi

FIT 5 3191.3m Misrun

FIT 6 3048.0m
REC 2100 cc water
FSIP = 5000 psi
HP = 5750 psi

FIT 7 3178.2m
REC 1.1 cubic feet Gas
FSIP = 5300 psi
HP = 6050 psi

FIT 8 3255.3m
REC 2100 cc water
FSIP = 5950 psi
HP = 6700 psi

SHOWS: Only low levels of background gas were reported throughout the Eastern View Coal Measures, the only exception was when the well kicked from a sandstone interval (3183.3 - 3185.2m). Subsequent testing of the zone by FITs produced fresh water and a small volume of gas, probably solution gas.

RESERVOIR: The reservoir quality of sandstones within the zone of abnormal pressure was good, individual beds up to 18m thick have core porosities of 15-28% and permeabilities of up to several hundred millidarcies.

MATURITY: The oil window (vitrinite reflectance 0.7%) was intersected at approximately 3050m. The maximum recorded mean vitrinite reflectance of 0.9% occurs at total depth, however, there is a large variation in the results at this depth with valves ranging from 0.70 - 0.95% from individual samples.

SOURCE ROCK: Only three samples were analysed from Poonboon 1, all for total organic carbon only. Two coals at 3040.3 and 2473.1m yielded 27.6% and 63.1% TOC respectively, whilst a shale at 2687.7m yielded 1.93% TOC.

POST MORTEM: Poonboon 1 established that good quality reservoirs can be preserved at depth within the Eastern View Coal Measures and within the abnormally pressured zone.

The absence of hydrocarbons in the well other than in the interval 3183.3 - 3185.2m is not fully understood. The well location was based on sparse seismic data and to this day is still not well defined. Indications are that the well may not be crestal on the broad anticlinal dome.

Limited possibilities exist for vertical migration due to the small number of faults in the area, therefore lateral migration would be needed to develop an accumulation. It is probably that reservoir rocks intersected may not have had access to a mature drainage area. Although the structure does appear to drape over a pre cursor Cretaceous culmination the closure may have developed, quite late, as a result of the Miocene compressional event and, hence, may post date hydrocarbon migration.

GWF9107.009-RJS

WELL SUMMARY AND POST MORTEM

WELL: Narimba 1 **OPERATOR:** Esso **PERMIT:** T/5P

LOCATION: Lat: 40° 16' 18.080"S Long: 145° 43' 53.581"E

SPUD: 31 August 1973 **RIG RELEASE:** 4 October 1973

TD: 3353.7m **KB:** 9.75m **WATER DEPTH:** 77.1m

DRILLING RIG: Glomar Conception **STATUS:** Gas shows, P&A

STRUCTURE: Narimba 1 was drilled to test an anticlinal map on tend with, and 12km to the northwest of the Pelican structure. Current mapping indicates that only a small area is closed at the middle *M.diversus* level, whilst closure is absent at both the top of the Eastern View Coal Measures and at the *L.balmei* level.

STRATIGRAPHY:

	KB(M)	SS(M)
Torquay Group	86.9	-77.1
Demons Bluff Fm	1654.5	-1644.7
EVCM	1793.4	-1783.7
M.M.diversus	2545.1	-2535.3
TD (lower *M.diversus*)	3353.7	-3343.9

DRILLING DATA:

Hole size (")	Depth (m:KB)
26	235.3
16½	859.8
12¼	2697.5
8½	3353.7

Casing size (")	Depth (m:KB)
20	205.7
13⅜	837.3
9⅝	2684.7

DRILLING: No abnormally pressured section was reported in the well completion report, however studies of shale velocities at Pelican and Narimba show similar trends indicating that Narimba is also probably abnormally pressured below approximately 2800m. This conclusion is also in agreement with the high mud weight of 11.0 ppg used to reach total depth.

CORES: Three cores were cut as follows:

1	2827.9 - 2836.8m	Rec	8.7m	EVCM - middle *M.diversus*
2	2908.4 - 2914.2m	Rec	5.6m	EVCM - Lower *M.diversus*
3	2971.8 - 2973.6m	Rec	1.8m	EVCM - lower *M.diversus*

SWC: 90 cores were attempted between 914.4 - 3346.1m
84 were recovered.

TESTS: No drill stem tests were performed. 5 FITs were undertaken with the following results:

1	2877.3m	
	Rec.	0.1 cubic feet Gas
		+ 2200 cc water
	ISP	= 4250 psi
	FSIP	= 4300 psi
	HP	= 5075 psi
2	2999.8m	
	Rec	0.35 cubic feet Gas
		+ 1900 cc water
	FSIP	= 4380 psi
	HP	= 5750 psi
3	2919.4m	
	Rec	0.5 cubic feet Gas
		+ 2200 cc water
	FSIP	= 4150 psi
	HP	= 5500 psi
4	3124.5m - No recovery	
	FSIP	= 4700 psi
	HP	= 5800 psi
5	3062.9m Tool plugged, no recovery	

SHOWS: Background gas and peaks associated with coals were detected in the upper EVCM to the top of the middle *M.diversus* zone. In the middle and lower *M.diversus* zones several gas peaks from sandstones were recorded, the largest of which were tested by FIT. The FIT tests produced only small volumes of gas, probably solution gas. Shows of fluorescence and oil were reported from samples of the sandstone at approximately 2950m and at 3340m.

RESERVOIR: Good to excellent quality reservoirs are indicated from logs in the upper EVCM above the base of the upper *M.diversus* palynological zone. Whilst the better reservoirs of the lower and middle *M.diversus* zone were not cored, core analysis results from a sandstone in core 1 yield porosities of 18-25% and permeabilities of up to 330 millidarcies.

MATURITY: A small suite of four samples from 3137.6 - 3291.2m (lower *M.diversus*) were subjected to vitrinite reflectance determinations and gave values in the range 0.71 - 0.79%. These values plot approximately 0.1% lower in maturity than samples at equivalent depths at Pelican Field. The most

likely explanation for this is that the Narimba structure has been subjected to a lesser amount of tectonic inversion than the Pelican structure.

SOURCE ROCK: The stratigraphical and lithological successions in Narimba and the Pelican wells are similar and therefore it is likely that the source rock distribution and compositions are similar. Only limited source rock studies have been performed on samples from Narimba. Three samples were analysed for total organic carbon content, a coal at 2803.2m yielded a value of 70.25%, and a dark shale at 2911.4m yielded a value of 2.4% TOC and another dark shale at 2971.8m yielded a value of 2.47% TOC.

POST MORTEM: Minor gas and fluorescence shows in Narimba are consistent with its location in the generative centre of the Pelican half graben.

The absence of productive zones either shows that the simple and small closure at Narimba 1 was developed too late to trap hydrocarbons or that it is in a migration shadow zone with hydrocarbons bypassing the structure going updip into the Pelican Field.

GWF9107.009-RJS

WELL SUMMARY AND POST MORTEM

WELL: Pelican 4 **OPERATOR:** Hematite **PERMIT:** T/6P

LOCATION: Lat: 40° 21' 40.02"S Long: 145° 52' 15.36"E

SPUD: 17 January 1979 **RIG RELEASE:** 18 February 1979

TD: 3051m **KB:** 25m **WATER DEPTH:** 77.4m

DRILLING RIG: Ocean Endeavour **STATUS:** Gas Cond Appraisal, P&A

STRUCTURE: Pelican 4 is located 3.5 km southeast of Pelican 1 on a separate fault block of the Pelican anticline. Closure at the middle *M.diversus* and *L.balmei* levels is dependant on sealing on at least two faulted margins.

At the top of the Eastern View Coal Measures the well is located near the western limit of a large fault independent closure. A fault intersects the well in the lower *M.diversus* zone and faults out the lower-most part of the lower *M.diversus* zone.

STRATIGRAPHY:

	KB(M)	SS(M)
Torquay Group	102.4	-77.4
Demons Bluff Fm	1634	-1609
EVCM	1735	-1710
M.M.diversus	2443.5	-2418.5
L.balmei	2960	-2935
TD (upper *L.balmei*)	3051m	-3026

DRILLING DATA:

Hole size (")	Depth (m:KB)
26	247.8
17½	870.2
12¼	3051

Casing size (")	Depth (m:KB)
20	231.3
13⅜	850.1

DRILLING: No drilling problems related to the geology were encountered, however abnormally pressured sediments were encountered within the middle *M.diversus* zone.

CORES: Two cores were cut as follows:

1	2846 - 2858m	Rec	12m	EVCM - lower *M.diversus*
2	2918 - 2931m	Rec	13m	EVCM - lower *M.diversus*

SWC: 95 cores were attempted between 887.0 - 3037.3m
89 were recovered.

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TESTS: Four FIT and three RFT tests were performed as described below, no drill tests were performed.

FIT 1 2739.5m (8988')
Rec: 47.66 cubic feet Gas
+ 1500 cc Condensate
FSIP = 4000 psi
FP = 60 psi
HP = 4902 psi

FIT 2 2793.2m (9164')
Rec: 0.34 cubic feet Gas
+ 15,700 cc Water
FSIP = 4200 psi
FP = 400 psi
HP = 5068 psi

FIT 3 2847.4m (9342')
Rec: 0.3 cubic feet Gas
+ 700 cc Water
FSIP = 0 psi
HP = 5000 psi

FIT 4 2815.7m (9238')
Rec: 0.1 cubic feet Gas
+ 20,700 cc Water
FSIP = 4250 psi
FP = 500 psi
HP = 5300 psi

RFT 1 2824.0m (9265')
Rec: 0.09 cubic feet Gas
+ 125 cc Condensate
+ 10,752 cc Water
ISIP = 4253 psi
HP = 5070 psi

RFT 2 2822.8m (9261')
Rec: 0.03 cubic feet Gas
+ 9250 cc Water

RFT 3 2884.6m (9464')
Rec: 69.5 cubic feet Gas
= 900 cc Condensate
= 11,400 cc Water
ISIP = 4388 psi
FSIP = 4289 psi
HP = 5874 psi

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SHOWS: Hydrocarbons were recovered from wireline tests in three sands:

2519m, 125 cc condensate
2740m, 47.66 cubic feet gas, 1500 cc condensate
2885m, 69.5 cubic feet gas, 900 cc condensate

During drilling, fluorescence from coals was reported below 2210m and high gas readings were associated with coal beds. Gas with hydrocarbon fractions heavier than methane was recorded on the gas chromatograph from depths below 2579m.

RESERVOIR: Log derived porosities for sands in the lower to middle *M.diversus* zone range between 11.2% and 18.5%. Values obtained from core analysis range up to 20.5%. Permeabilities calculated from pressure data by the operator are described as low throughout the entire lower to middle *M.diversus* zone. Permeabilities measured from core are also low (less than 10 millidarcies).

MATURITY: Only two maturity measurements were made at Pelican 4, both at approximately 2916.9m. The measured mean maximum vitrinite reflectance was 0.73 - 0.75% and is in agreement with maturity profiles established in other Pelican wells.

SOURCE ROCK: No source rock data has been collected from samples from Pelican 4, see data and observations from nearby Pelican 5.

POST MORTEM: Pelican 4 confirmed the presence of gas condensate charged lower to middle *M.diversus* reservoirs in a separate fault block at the southern end of the Pelican structure. Permeability data derived from core and test data were not encouraging and the well was plugged and abandoned.

GWF9107.009-RJS

WELL SUMMARY AND POST MORTEM

WELL: Pipipa 1 **OPERATOR:** Hematite **PERMIT:** T/P5

LOCATION: Lat: 40° 23' 14"S Long: 145° 41' 45"E

SPUD: 4 May 1982 **RIG RELEASE:** 23 May 1982

TD: 2115m **KB:** 21m **WATER DEPTH:** 73m

DRILLING RIG: Southern Cross **STATUS:** Oil & Gas Shows, P&A

STRUCTURE: The Pipipa structure is located approximately 15km southwest and updip of the Pelican structural complex. Structurally therefore the well is located on the southwestern flank of the Pelican half graben a province subsequently named the Southwest Ramp. At the time of drilling the well was located to test the upper levels of the Eastern View Coal Measures in a fault controlled anticline.

STRATIGRAPHY:

	KB(M)	SS(M)
Torquay Group	94.0	-73.0
Demons Bluff Fm	1411.0	-1390.0
EVCM	1523.0	-1502.0
M.M.diversus (?)	2049.0	-2028.0
TD (? *M.M.diversus*)	2115.0	-2094.0

DRILLING DATA:

Hole Size (")	Depth (m:KB)
17½	880
12¼	2115

Casing size (")	Depth (m:KB)
20	213
13⅜	866

DRILLING: No drilling problems are reported from Pipipa 1.

CORES: No cores were cut in Pipipa 1.

SWC: 30 cores were attempted between 1383.0 - 2105.0m
29 were recovered.

TESTS: No formation tests were performed.

SHOWS: At the top of the Eastern View Coal Measures a small gas peak of 20 units was detected, between this gas peak and a depth of approximately 1940m no fluorescence was observed in the cuttings and gas peaks were only associated with coals. Within the *M.diversus* zone over the interval 1940 - 2050m fluorescence was reported from cuttings in the range 0 - 40%, the best show being from a sandstone from 1945 - 1952m where fluorescence of up to 40% was observed. The fluorescence is described as milky

yellow green with a moderate to fast milky cut. The chromatograph recorded the presence of methane to pentane below 1920m and hexane was observed between 1985m and 2050m. Sidewall core samples from 1949.8 and 1946.2m yielded oil saturations of 2 and 22% respectively.

Log analysis of this zone indicated only the presence of residual hydrocarbons and consequently no testing was undertaken. Log analysis by SAGASCO supports these conclusions.

RESERVOIR: Excellent porosity reservoirs are present in the upper EVCM with porosities in excess of 30% and good indicated permeability from mud cake build-up as indicated by the caliper log. In the basal part of the well where the shows are reported, reservoir quality is good with log derived average porosities of 17 - 21.7% in sandstones 2-8.7m in thickness, and good permeability is indicated by mud cake build-up.

MATURITY: The maturity profile in Pipipa 1 is normal until a depth of 1750m where an unusually high mean vitrinite reflectance measurement of 2.29% was recorded, indicating the presence of an intrusion near to the well location.

Examination of cuttings descriptions and logs reveals no evidence of an intrusion at the well location. Below this depth the maturity values decrease toward total depth to a value of 1.41 - 1.57%. Examination of the data from the deepest sample indicates a bimodal distribution in the measured vitrinite reflectance values indicating that either there is contamination of the sample (cuttings) from higher vitrinite reflectance zones above this depth, or that another intrusion is near to the total depth of Pipipa 1.

SOURCE ROCK: No source data has been collected from samples from Pipipa 1, the nearest data occurs in the Pelican 5 well where similar source rocks probably occur. The Pipipa location is ideally located to trap hydrocarbons migrating from mature source rocks in the depocentre of the Pelican half graben.

POST MORTEM: Pipipa 1 was the first well drilled on the southern margin of the Pelican half graben, and was therefore an important control point in evaluating the stratigraphy, reservoirs and hydrocarbon potential of this flank. Unfortunately the well was not drilled deep enough to evaluate the middle to lower *M.diversus* gas condensate charged reservoirs encountered down dip at Pelican Field. However, the well did establish better quality reservoirs than exist at Pelican, and also demonstrated that hydrocarbons, most likely gas condensate but possibly also oil, have migrated from mature source rocks in the deeper part of the Pelican half graben.

The presence of nearby igneous intrusions is indicated from maturity data, however as at Yolla 1, there appears to have been no detrimental effect on reservoir quality.

The opportunity for hydrocarbon trapping along the southern flank of the Pelican half graben were significantly upgraded by the results of Pipipa 1.

GWF9107.009-RJS

WELL SUMMARY AND POST MORTEM

WELL: Pelican 5 **OPERATOR:** Amoco **PERMIT:** T/22P

LOCATION: Lat: 40° 20' 43.472"S Long: 145° 41' 49.296"E

SPUD: 28 December 1986 **RIG RELEASE:** 16 April 1986

TD: 4267m **KB:** 22.3m **WATER DEPTH:** 77m

DRILLING RIG: Diamond M.Epoch **STATUS:** Gas Cond Appraisal, P&A

STRUCTURE: Pelican 5 was drilled to establish the deliverability characteristics of the lower to middle *M.diversus* gas condensate charged reservoirs discovered and appraised by Pelican 1, 2 and 4. The location was selected on the basis of a map produced at the top of the 'F' sand (the thickest of the reservoir sands in the *M.diversus* zone). The selected location was on the same faulted block as the Pelican 1 well approximately half way between it and Pelican 4.

A secondary objective of the well was to evaluate the reservoir and hydrocarbon charge potential of the Palaeocene and Late Cretaceous sedimentary sequence which also have closure over the Pelican structure.

STRATIGRAPHY:

	KB(M)	SS(M)
Torquay Group	99.7	- 77.4
Demons Bluff Formation	1630.0	1608.0
EVCM	1747.0	-1725.0
M.M.diversus	2553.0	-2531.0
L.balmei	3111.0	-3089.0
? *T.lillei*	3940.0	-3918.0
TD (*T.lillei*)	4267.0	-4245.0

DRILLING DATA:

Hole Size (")	Depth (m:KB)
36	195
26	411
17½	1776
12¼	3002
8½	3647
6	4267
Casing size (")	**Depth (m:KB)**
30	192.0
20	400.2
13⅜	1753.8
9⅝	2994.1
7	3647.2
5	4065.1

DRILLING: Minor difficulties were encountered in the Torquay group during the first logging run and during running the 13⅜" casing due to tight hole conditions. Despite increasing abnormal pressures below the *M.diversus* palynological zone, no drilling problems were encountered.

CORES: Three cores were cut as follows:

1	2790.5 - 2808.5m	REC	18.0m	EVCM - *M.M.diversus*
2	2863.5 - 2881.7m	REC	18.2m	EVCM - *M.M.diversus*
3	2881.7 - 2896.2m	REC	11.5m	EVCM - *M.M.diversus*

SWC: 210 cores were attempted between 1800 - 4255m, 172 were recovered.

TESTS: Five RFT tests and six production tests through casing were performed as summarised below:

RFT 1 — 2788.3m (9148')
REC: 9500 cc Mud Filtrate
Trace Condensate

RFT 2 — 2881.0m (9452.1')
REC: 6500 cc Mud Filtrate

RFT 3 — 2882.0m (9455.4')
REC: 9500 cc Mud Filtrate

RFT 4 — 2788.2m (9147.6')
REC: 38.4 cubic feet gas
400 cc Condensate
5000 cc Mud Filtrate

RFT 5 — 2788.24m (9147.8')
REC: 9500 ccr Mud Filtrate

DST 1 — 3671.9 - 3685.6m (12,047.0 - 12,092.0')
No pressure. No flow.

DST 1A — 3685.6 - 3699.0m (12,092.0 - 12,136.0')
No pressure. No flow.

DST 2 — 3611.9 - 3618.0m (11,850.0 - 11,870.0')
No pressure. No flow.

DST 3 — 3611.9 - 3618.0m (11,850.0 - 11,870.0') and
3440.0 - 3451.0m (11,285.9 - 11,322,0')
NGTS
REC: Gas cut mud from upper zone.
Shut in pressure 800 psi declining to zero.

DST 4 3142.0 - 3163.0m (10,308.0 - 10,378.8')
GTS at 0.75 MMCFD with trace condensate after 9½ hours on a ½" choke.
GTS at 0.433 MMCFD on a 2" choke with 0.5 barrel condensate from the separator.

DST 5 2869.0 - 2883.0m (9412.6 - 9458.5')
REC: Small quantity of condensate (waxy and parafinnic; 51° API at 60°F), and flowed at 0-23 psi.

DST 5A 2855.0 - 2860.5m (9366.6 - 9384.7')
REC: 85 barrels of GCM and WCM.

DST 6 2786.0 - 27900m (9140.0 - 9153.5')
GTS @ 3.5 MMCFD with 450 BCPD on a ⅜" choke.
GTS @ 5.6 MMCFD with 302-441 BCPD and 662-705 BWPD on a ¾" choke.

SHOWS: Pelican 5 recorded a similar distribution of gas shows and shows of fluorescence through the lower and middle *M.diversus* zones to that encountered in Pelican 1, 2 and 4. Below the top of the Palaeocene the gas and florescence shows continued to total depth in the Late Cretaceous. Increased concentrations of the heavy hydrocarbons (Butane to Pentane) are observed on the gas chromatograph with increased depth.

RESERVOIR: The lower to middle *M.diversus* sequence contained similar quality reservoirs to those encountered in the earlier Pelican wells. In the Palaeocene and Late Cretaceous sequence similar deltaic and fluvial sandstone reservoirs were encountered to those in the lower to middle *M.diversus* zones. Log analysis by the operator prior to testing indicated the potential for 62m of net pay using cut off of SW <50%, Vsh <50% and porosity >10%. Despite these promising results production testing failed to meet the initial enthusiasm and many of the apparent pay zones proved to be tight with low permeability. Only two zones flowed hydrocarbons, at the top of the Palaeocene, a sandstone between 3142 - 3163m flowed gas at 0.75 MMCFD, and a test of a sand in the "E" unit of the middle *M.diversus* zone flowed at a more encouraging rate of 5.6 MMCFD with 302-441 BCPD and 662-705 BWPD. The water in the second test is interpreted to be from a deeper interval via communication behind casing as there was no water recovery during an earlier flow period.

MATURITY: Pelican 5 provides the most complete maturity profile for the central part of the Pelican half graben. The profile down to the top *L.balmei* zone matches that recorded in other Pelican wells. Peak oil maturity (vitrinite reflectance 1.1%) is reached at a depth of approximately 3,600m and the wet gas window (vitrinite reflectance 1.3%) starts at approximately 3800m. The maximum mean vitrinite reflectance of 1.67% was measured in the deepest sample near to total depth.

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SOURCE ROCK: The primary source rock interval in T/25P is the Eastern View Coal Measures. The source potential of the Otway Group has not been tested in the permit and is unknown. Analysis of samples from the Eastern View Coal Measures has identified samples with good to very good gas richness (C_1-C_4=10,000 - 180,000 ppm) throughout the Eocene and Palaeocene intervals. Wet gas (C_5+) yields in excess of 1000 ppm occur at two levels which produced hydrocarbons on test. Total organic carbon valves are high because of the presence of abundant coal seams. TOC values range between 1.10-79.2% in the Eocene, 0.96 - 47.0% in the Palaeocene and 0.82 - 13.7% in the Late Cretaceous. Potential hydrocarbon yields (oil and gas) are very high in the Eocene and Palaeocene (S_1+S_2 >6-366 kg hydrocarbons/tonne). However, much of this genetic potential is likely to be for gas and condensate. Cuttings from the Late Cretaceous were contaminated by cavings. One carbonaceous claystone at 3846m gave a S_1+S_2, ratio of 24 kg hydrocarbons/tonne, whilst sidewall core data indicated poor source richness from the Late Cretaceous section (S_1+S_2 <2 kg hydrocarbon/tonne).

In the Eocene coal in the dominantly carbonaceous lithofacies, two main types of organic matter were identified, a good quality oil and gas-prone type II-III kerogen and a poor quality dry gas-prone type IV kerogen. The major kerogens are vitrinite (45-85%) and exinite (10-40%). The exinites include resinite and subertinite which are potentially generative at low maturities (vitrinite reflectance, 0.45% for oil generation).

In the Palaeocene the source rock consists of more mature oil and gas-prone type II-III kerogen. Coal is less abundant, and the major exinite is sporinite.

In the Late Cretaceous source rocks shale appears to be the most common organic-rich rock type. Many shales are very rich in exinite (up to 85% of DOM). The oil deadline for this exinite which is dominantly bituminite is a vitrinite reflectance of 0.9% and therefore most of these shales are now post-mature for oil Earlier in their history they were probably prolific sources of liquid hydrocarbons.

Source affinity studies were conducted on samples of liquid hydrocarbons recovered from Pelican 5. A condensate sample from 2788.2m has an alkane composition and aromatic content which reflect derivation from land-plant organic matter. The C_{12}+ composition also attests to a terrestrial source affinity as shown by dominance of C_{29} in the C_{27}-C_{29} sterane and diasterane distributions, high pristane/phytane and pristane/n-heptadecane ratios. These ratios also indicate that the organic matter was exposed to oxic conditions prior to being reworked in a peat swamp by anaerobic bacteria.

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POST MORTEM: Pelican 5 confirmed the presence of a large gas-condensate accumulation in the lower to middle *M.diversus* zone at Pelican Field. Testing of the reservoirs in this zone was disappointing with only low to moderate deliverability being achieved at best.

Pelican 5 also established that the rich gas condensate ratios (135 bbls/MMCF) measured from FIT recoveries in earlier wells were substantiated by test results.

The Palaeocene and Late Cretaceous sequence contains sandstone reservoirs which appear to be charged with rich gas condensate (from observation of the gas chromatograph) but when testing was attempted all zones proved to be tight.

Further drilling on the Pelican structure to establish if better permeability reservoirs occur on other fault blocks is considered high risk. Fault blocks at higher structural elevations may have better preserved reservoir quality and therefore provide a more acceptable level of risk.

GWF9107.009-RJS

WELL SUMMARY AND POST MORTEM

WELL: Flinders 1 **OPERATOR:** SAGASCO Resources Ltd **PERMIT:** T/25P

LOCATION: Lat: 40° 22' 51.810"S Long: 145° 40' 18.690"E

SPUD: 1000 hrs, 29 November 1992 **RIG RELEASE:** 1400 hrs, 22 December 1992

TD: 2723m (RT) **RT:** 22.3m (MSL) **WATER DEPTH:** 69.25m

DRILLING RIG: Ocean Epoch **STATUS:** Plugged & Abandoned

STRUCTURE: Flinders 1 was located 2km WNW of Pipipa 1. Closure at the top EVCM is unquestionable however a higher risk fault dependent closure was postulated for the prospective zones of the *M.diversus* and Palaeocene. Current mapping, unfortunately, shows that no closure exists at these levels.

STRATIGRAPHY:

	RT(M)	SS(M)
Torquay Group	91.55	-69.25
Demons Bluff Fm	1436.5	-1414.2
EVCM	1546.0	-1523.7
M.M.diversus	?	?
L.balmei	2483.3	-2461.0
TD (Basal *L.L.Balmei*)	2722.3	-2700.0
Dolerite Sill (67m)	2208	-2185.7

DRILLING DATA:

Hole Size (")	Depth (m:KB)
36	124.5
17½	408.0
12¼	1525.0
8½	2723.0
Casing Size (")	**Shoe Size (m:KB)**
30	124.50
13⅜	403.00
9⅝	1519.98

DRILLING: Tight intervals were encountered while tripping from the 1525m casing point. Reaming and increasing mud weight improved the hole, however HLS hit a bridge at 1240m with their combination tool and the intermediate logs were run from there to 403m. A wiper trip was made and casing was run to 1520m. During drilling of the 8½" hole numerous tight spots were encountered on frequent wiper trips. These were reamed and generally caused no further problems.

CORES: None cut.

SWC: Abandoned.

TESTS: None performed.

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SHOWS: No significant hydrocarbons were encountered within the Torquay Group or Demons Bluff Formation. Methane was first detected after drilling out of the 340mm casing at about 880m. Volumes slowly increased with depth and at 1410m ethane, was first detected. From there through to the 244mm casing point at 1525m the gas maintained a background level of 12 units* with a chromatographic breakdown of $C_1$96%$C_2$3%$C_3$5% **. A maximum of 30 units was detected at 1383m comprising 100% methane.

* 1 unit = 200ppm methane equivalent in air.

** Chromatographic breakdown expressed as percent total volume analysed, C_1%C_2%C_3%C_4%C_5+% Routine analysis were run to C_5+.

Rare minor fluorescence and no significant gas shows characterised the EVCM. All observed gas peaks were from coals or carbonaceous shales.

From the 244mm casing shoe to the first observed occurrence of fluorescence at 2004m gas levels remained low at 2 to 3 units with the composition changing from $C_1$96%$C_2$4% to $C_1$65%$C_2$30%$C_3$5%. The only exceptions were gas peaks at 1947m (1951m (L)) and 1977m (1981m (L)) of 12.3 and 20.7 units respectively, both associated with coal seams. From 2004m (2008m (L)) to the top of the dolerite sill at 2204m (2208m (L)) the background gas levels remained low with the only gas peaks associated with the coal beds. The proportion of methane continued to decrease with depth such that the background gas gave a composition of $C_1$46%, $C_2$42%, $C_3$12% in the claystone above the sill.

The only shows recorded were very poor and over the intervals 2004m to 2012m (2008 to 2016m (L)) and 2070m to 2075m (2074m to 2079m (L)) and were associated with tight fine grained sandstone. The fluorescence was spotty dull yellow green with a slow milky cut but was unaccompanied by any gas peak.

From the base of the sill at 2271m (2276m (L)) to TD 2323m the background gas levels ranged from 5 to 10 units with a relatively stable composition of $C_1$83%, $C_2$12%, $C_3$5% Numerous gas peaks were observed, the maximum being 114 units at 2363m (2368m L) ($C_1$92%, $C_2$5%, $C_3$3%), but all were derived from coals.

Trace shows were observed at 2563m (2567m (L)) and 2673m (2676m (L)), but were both confined to thin fine grained tight sandstones.

RESERVOIR: Porosity data for the EVCM sands falls into three sets. Two sets lie above the dolerite sill while all points below the sill comprise the third set. Above the sill the lower values generally correspond with sands less than 2-3m thick and the upper values with sands in excess of 3m. The lower porosity set has values evenly spread from 5% to 15% with the thicker sands being poorly sorted. In contrast the porosities of the higher set range from 18% to 36% with a clear median value of 23% and with no

significant decrease of porosity with depth. These sands are generally fine to medium and locally coarse with moderate to good sorting but becoming predominantly very fine to granular and poorly sorted with depth.

Below the sill porosities range from 4% to 18% and unexpectedly display a general average increase with depth. The sands become increasingly well developed with depth with an associated decrease in calcareous cementation.

Comparison of the visual cuttings porosity with the log porosities shows that the visual estimates were generally conservative. This is both a function of the unconsolidated nature of the sands and the dispersive nature of the claystones as seen at surface. Porosity estimates being influenced by the amount of clay matrix assigned to the sandstone.

As no formation tests or cores were taken at Flinders 1 there have been no measurements of permeability but the induction, SP and caliper logs frequently show indications of good permeability.

MATURITY: TMax values show an unusual profile resulting from igneous activity associated with the Flinders structure. From the near top EVCM to immediately below the igneous intrusion TMax values are consistently overmature (>460°C) whilst the lower part of the EVCM below approximately 2400m has TMax values in the oil mature window (430-460°C) consistent with a regional maturity profile unaffected by intrusives.

The vitrinite reflectance profile is in agreement with that shown by the TMax data, although because all the samples are from cuttings many of the histograms are bimodal due to contamination by cavings. Thermally altered samples have %Ro values between 1.65 & 2.8% due to contact alteration by the igneous intrusion. Samples from 2178 to 2363m show a gradual decrease suggesting this interval represents the outer part of the contact metamorphic aureole. Reflectance at the base of the section ranges from 0.66 to 0.72% where contact alteration is not present.

SOURCE ROCK: A hydrogen index verses oxygen index plot shows that the sources material is mixed type II and III kerogen consistent with other source material from the Eastern View Coal Measures elsewhere in the Bass Basin.

Twenty-seven samples were analysed by Rock Eval and twenty five of these samples were submitted for determination of vitrinite reflectance measurements as described above.

Total Organic Carbon (TOC) is consistently high partly due to the presence of coals in the cuttings samples. Consequently TOC values typically fall in the very good to excellent category (2->4%). Free hydrocarbon richness (S_1) is fair to very good (0.20-1.60 mg/g) and locally excellent (> 1.60 mg/g).

The potential yield or genetic potential (S_1/S_2) is generally moderate to very good (2-20 mg/g) and is occasionally excellent (>20 mg/g). The production indices ($S_1/(S_1 + S_2)$) are largely affected by igneous activity observed at the Flinders 1 and are high (circa 0.3) above and immediately below the igneous intrusion, and decrease to approximately 0.15 below the intrusion.

POST MORTEM: The primary objectives of Flinders 1 were the fluvial sandstones of the lower to middle *M.diversus* (Primary Zone) of the Eastern View Coal Measures, located some 500m updip of the Pelican Field in a large fault bounded structure. The primary objective fluvial sandstones were intersected as prognosed, an amplitude anomaly observed on seismic data was caused by the presence of an igneous intrusion, intruded near to the top of the primary target. There were no significant shows associated with the primary target. Sandstones below the primary target, age dated as Palaeocene, over the intervals 2559-2562m and 2673-2676m have minor shows of fluorescence and cut, possibly resulting from early *insitu* generation or migration of hydrocarbons.

The secondary objective sandstones in the upper *M.diversus* zone which contained shows at Pipipa 1 also contained shows in Flinders 1 but were generally less well developed. It is now interpreted that these shows are probably due to local sourcing associated with the elevated maturity profile associated with the igneous intrusion, rather than being indicative of migration from the Pelican Trough as was proposed prior to drilling.

The presence of minor shows in Palaeocene sandstones towards total depth is indicative of either local sourcing as the sequence is in the early oil mature window or migration of hydrocarbons from down dip in the Pelican Trough. There is, therefore, a possibility of hydrocarbons being accumulated in deeper Palaeocene and late Cretaceous sandstones, if a trap were developed in this area. Unfortunately current mapping fails to find any closure at these levels in Flinders 1.

The "upper" EVCM closure of the Flinders-Pipipa high has resulted from the early Miocene intrusive wedging into the country rock, uplifting the overlying section. This structure may post date significant migration of hydrocarbons.

In summary Flinders 1 failed to intersect hydrocarbons in the primary target because a trap is not present at this level. It failed at the secondary objective most probably as a result of inadequate vertical migration, but it is also likely the culmination did not exist when hydrocarbons were expulsed from Palaeocene and Late Cretaceous source rocks.

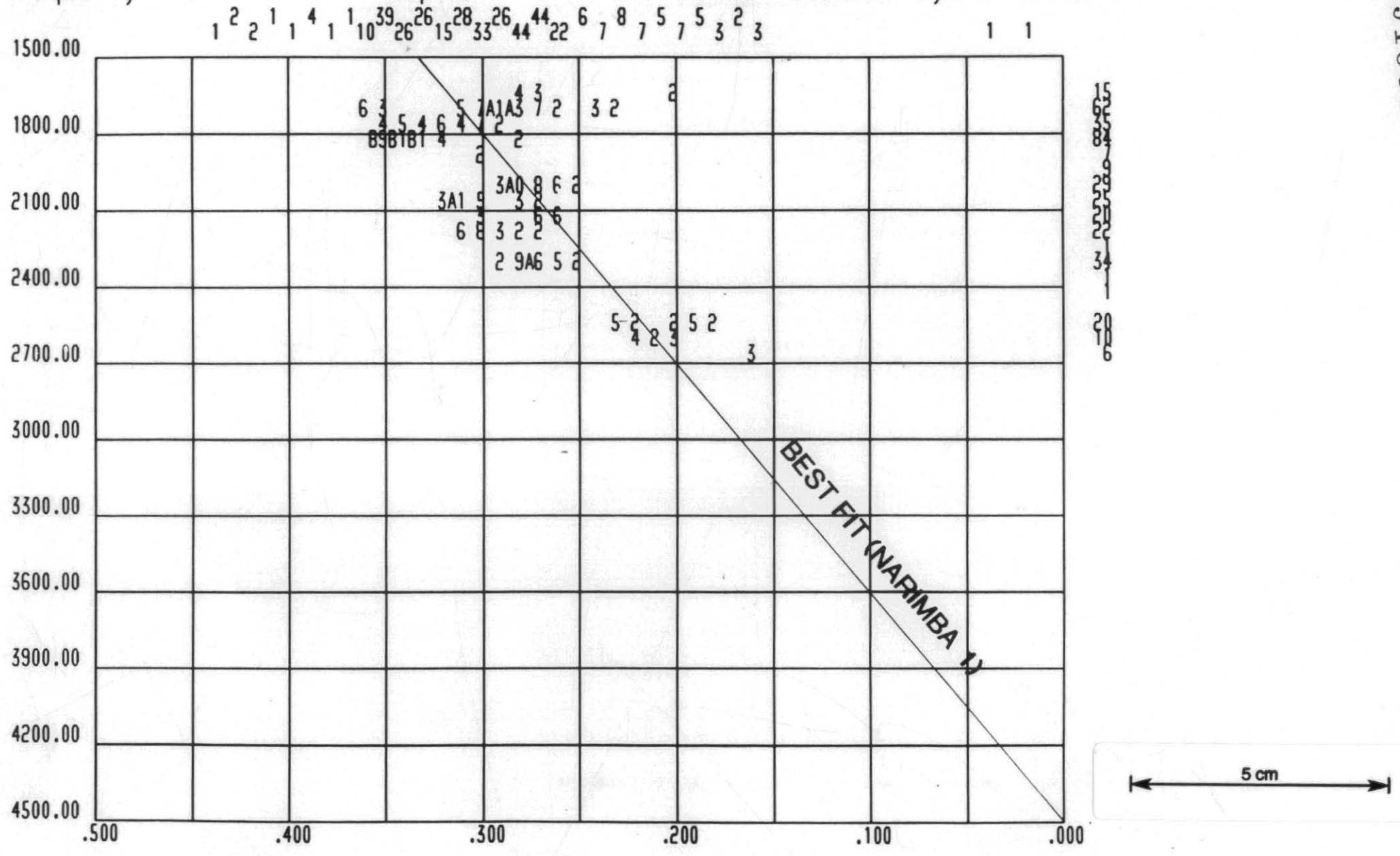
491389

APPENDIX 2

POROSITY - DEPTH PLOTS

Well Name: FLINDERS 1 TLOG - 5.2 - FREQ - - 9

Frequency Plot Depth: 1548.00 to 2800.00 by .10 meters



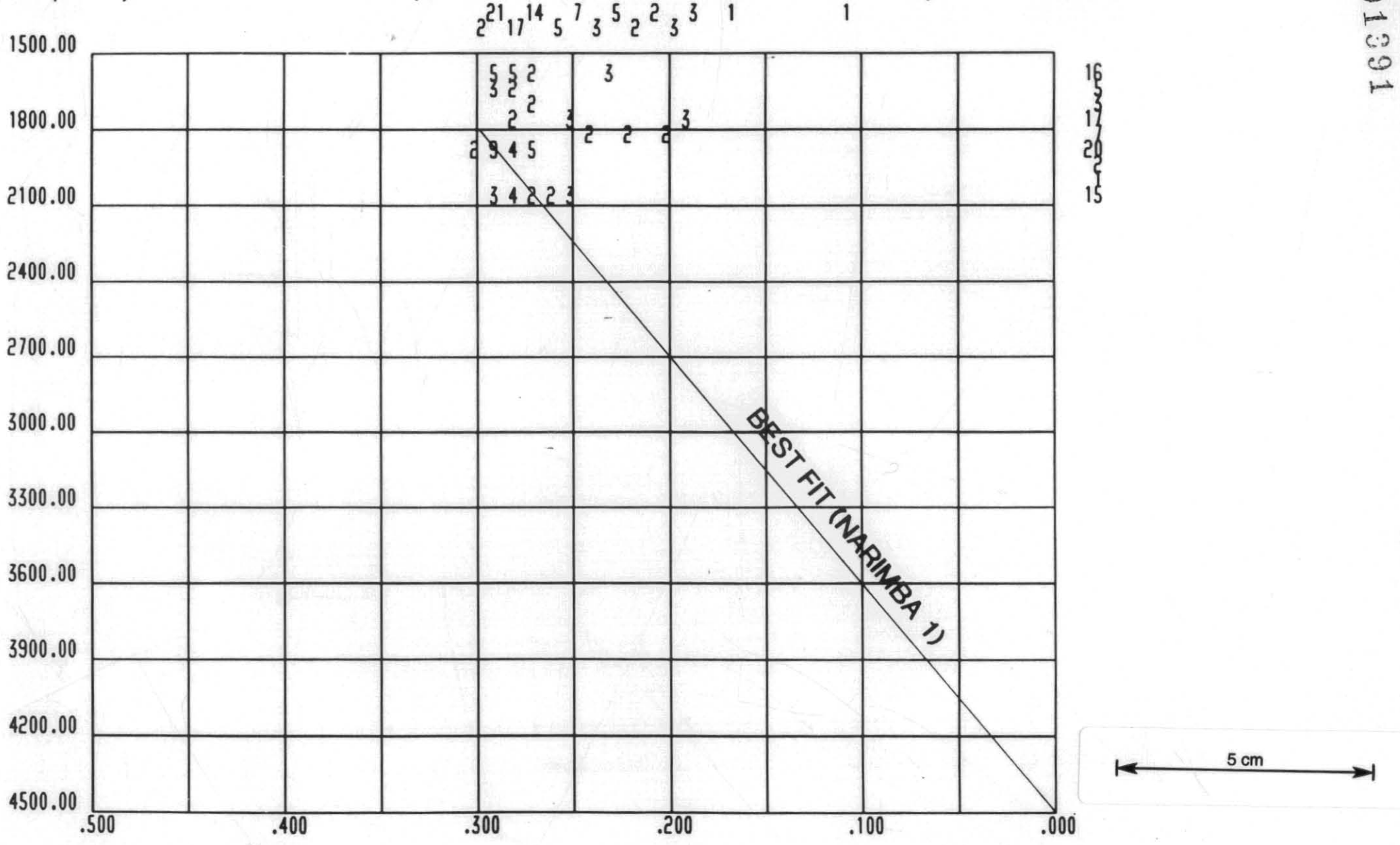
X Axis: PHI-DT Y Axis: DEPTH 381 of 12521 Pts plotted

Constraints: GR SS

4913390

Well Name: PIPIPA 1 TLOG - 5.2 - FREQ - - 10

Frequency Plot Depth: 1522.00 to 2114.77 by .15 meters



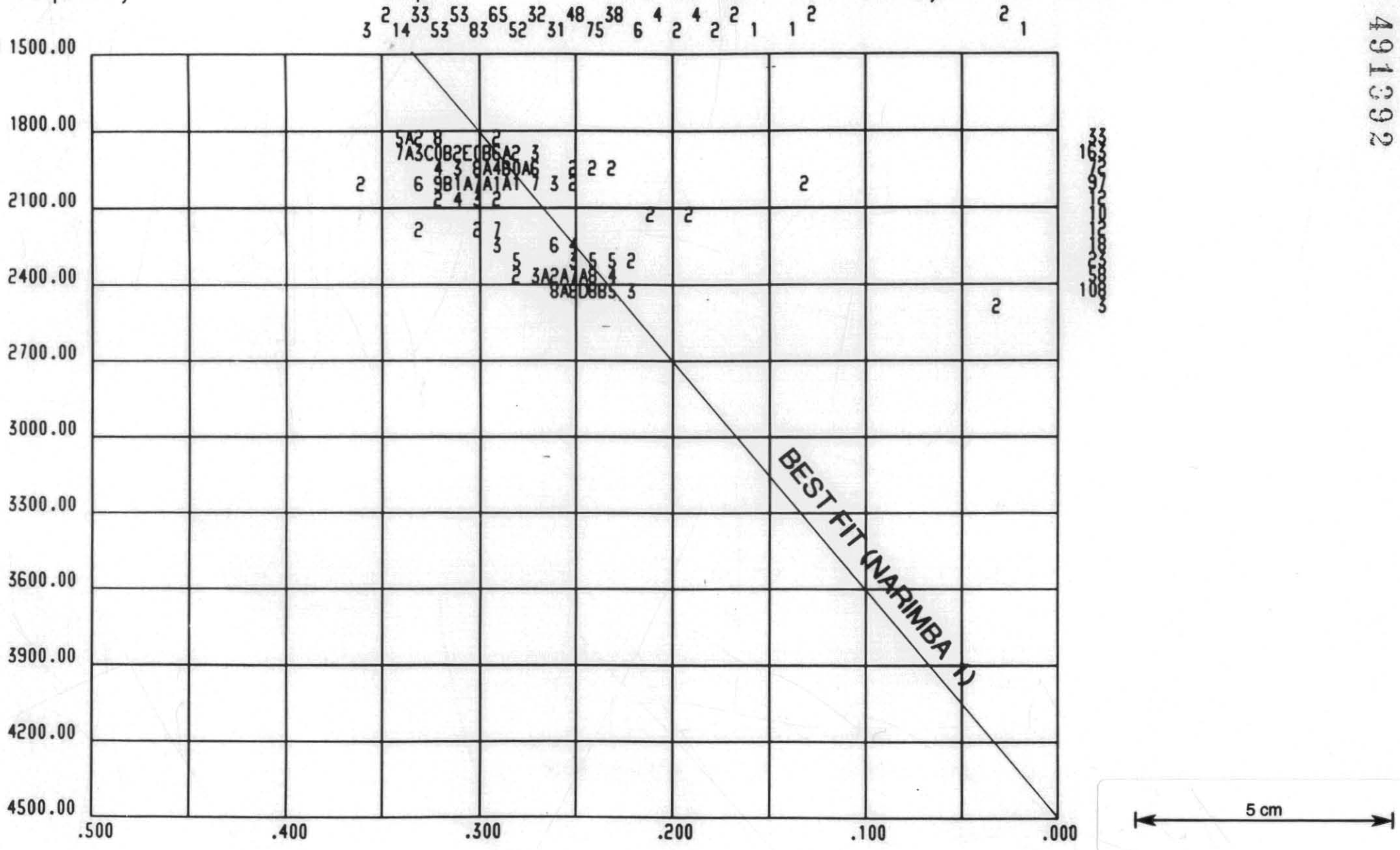
X Axis: PHI-DT Y Axis: DEPTH 86 of 3892 Pts plotted

Constraints: GR SS

491391

Well Name: PELICAN 1 TLOG - 5.2 - FREQ - - 7

Frequency Plot Depth: 1752.00 to 3177.84 by .15 meters



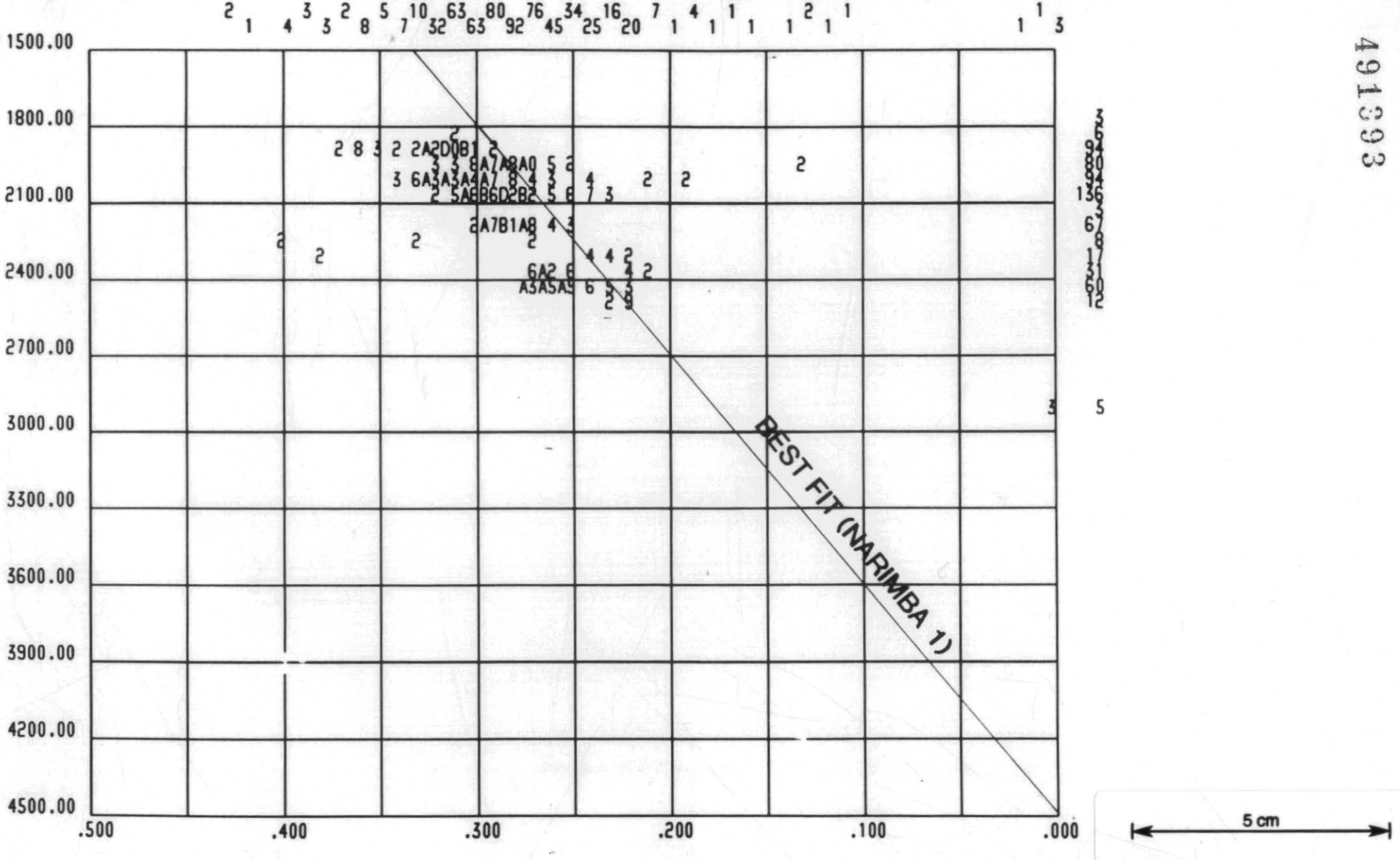
X Axis: PHI-DT Y Axis: DEPTH 609 of 9357 Pts plotted

Constraints: GR SS (PE

4913992

Well Name: PELICAN 2 TLOG - 5.2 - FREQ - - 16

Frequency Plot Depth: 1790.00 to 3078.48 by .15 meters



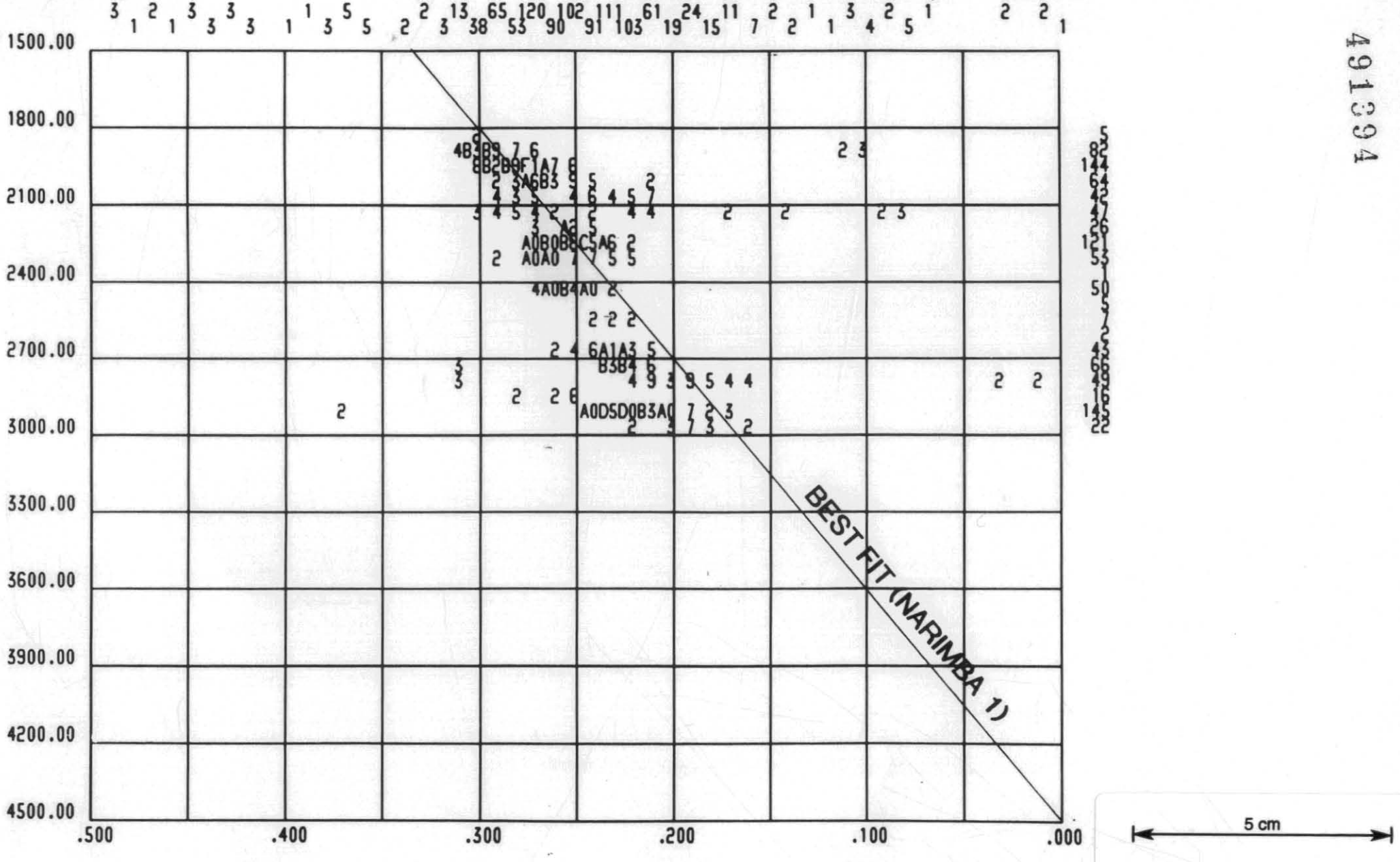
X Axis: PHI-DT Y Axis: DEPTH 616 of 8456 Pts plotted

Constraints: GR SS (PE

491393

Well Name: PELICAN 4 TLOG - 5.2 - FREQ - - 88

Frequency Plot Depth: 1750.00 to 3051.05 by .15 meters



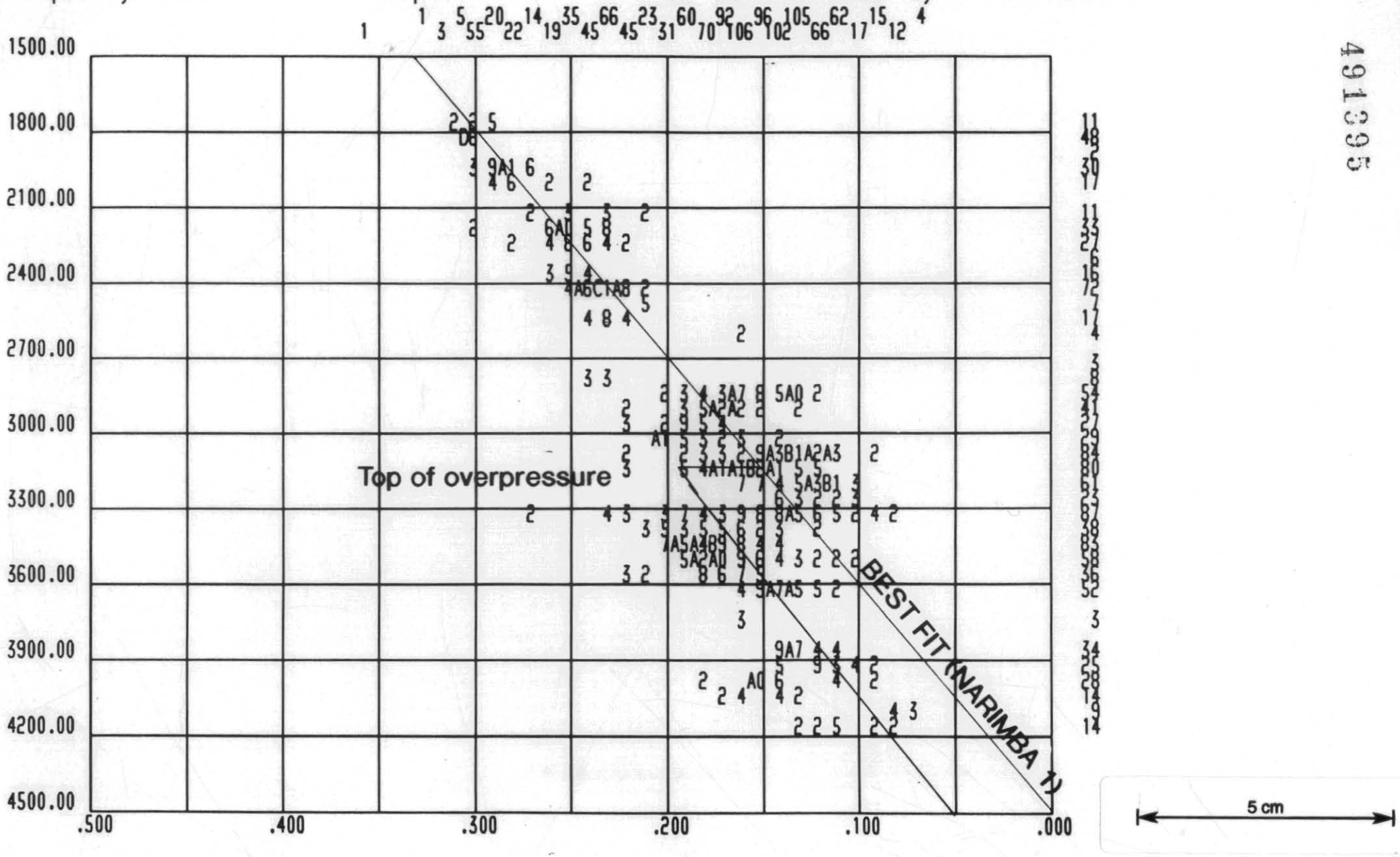
X Axis: PHI-DT Y Axis: DEPTH 990 of 8539 Pts plotted

Constraints: GR

4913994

Well Name: PELICAN 5 TLOG - 5.2 - FREQ - - 32

Frequency Plot Depth: 1747.00 to 4274.39 by .15 meters



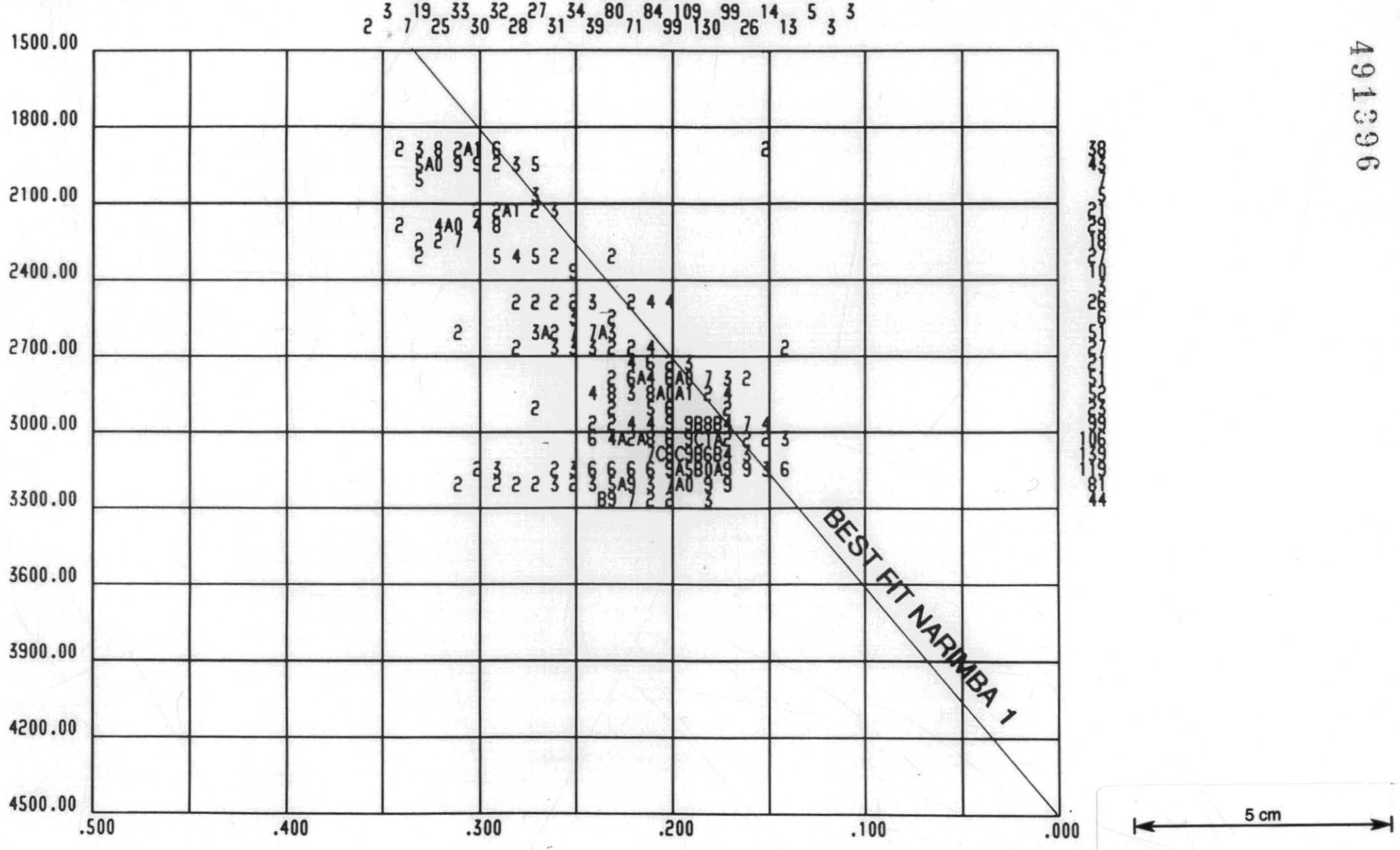
X Axis: PHI-DT Y Axis: DEPTH 1192 of 16597 Pts plotted

Constraints: GR SS

4913695

Well Name: POONBOON 1 TLOG - 5.2 - FREQ - - 26

Frequency Plot Depth: 1890.00 to 3270.50 by .15 meters



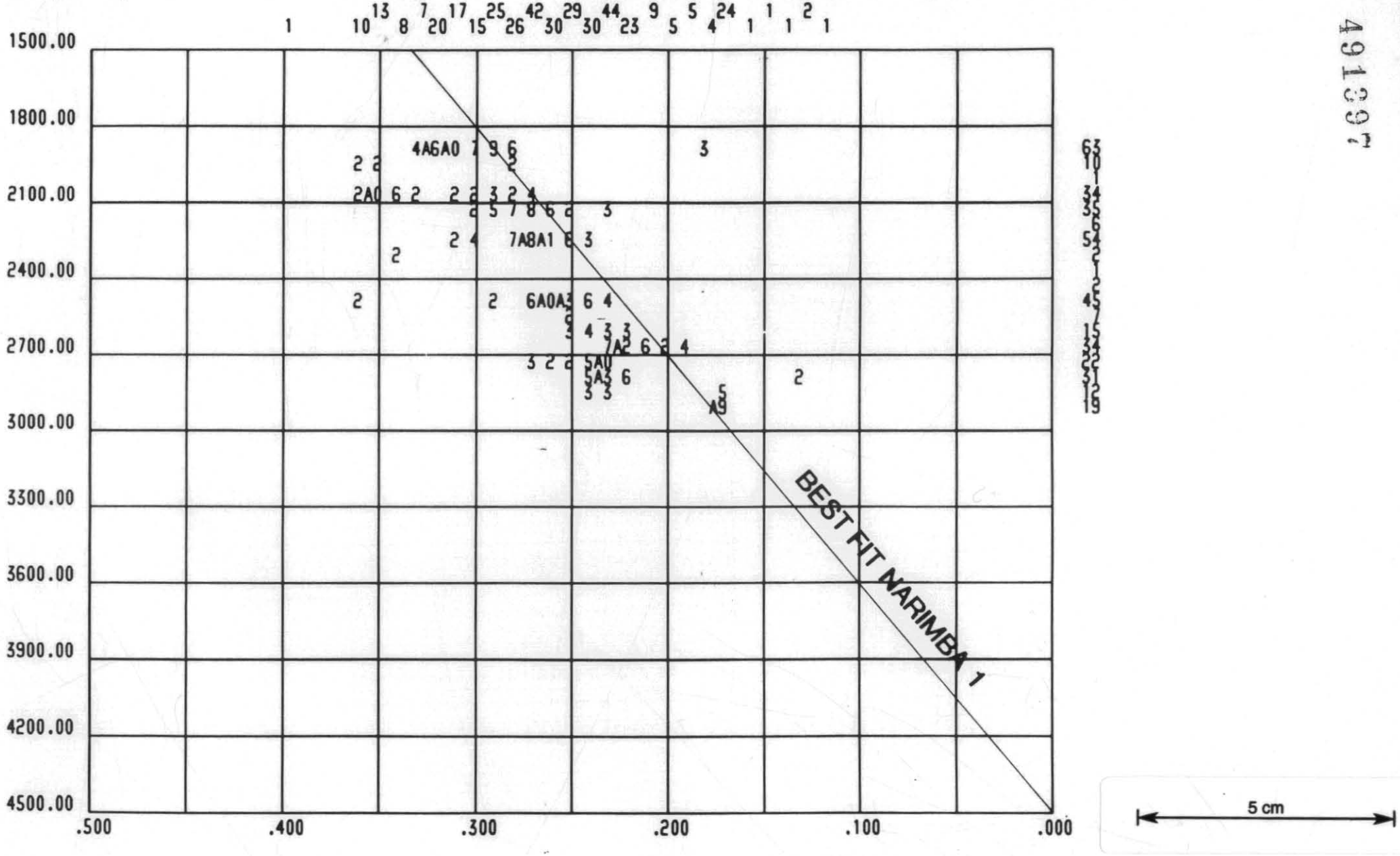
X Axis: PHI-DT Y Axis: DEPTH 1046 of 9060 Pts plotted

Constraints: GR SS (PE

4913396

Well Name: NANGKERO 1 TLOG - 5.2 - FREQ - - 9

Frequency Plot Depth: 1880.00 to 2887.68 by .15 meters



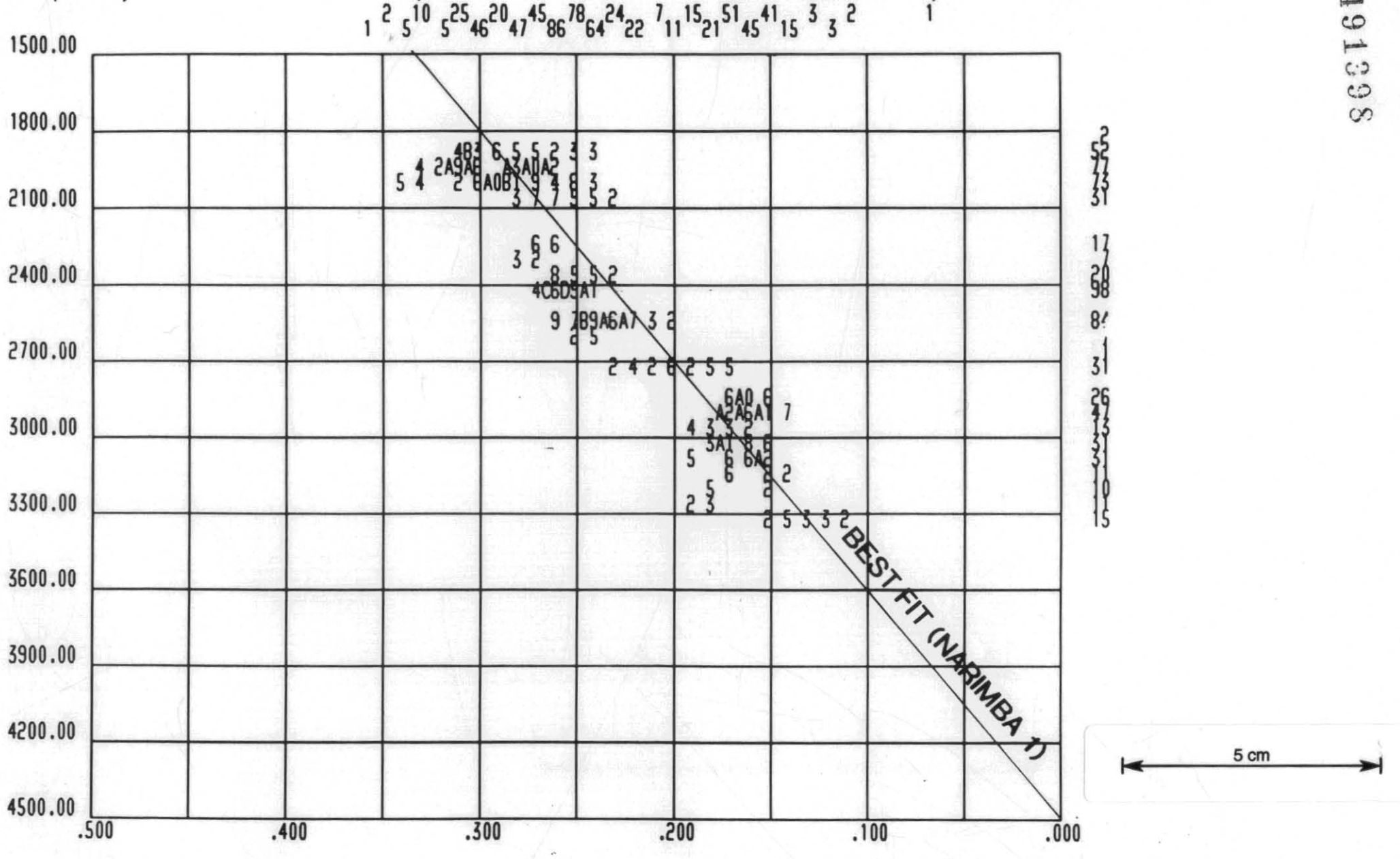
X Axis: PHI-DT Y Axis: DEPTH 393 of 6614 Pts plotted

Constraints: GR SS (PE

491391

Well Name: NARIMBA 1 TLOG - 5.2 - FREQ - - 14

Frequency Plot Depth: 1780.00 to 3382.37 by .15 meters



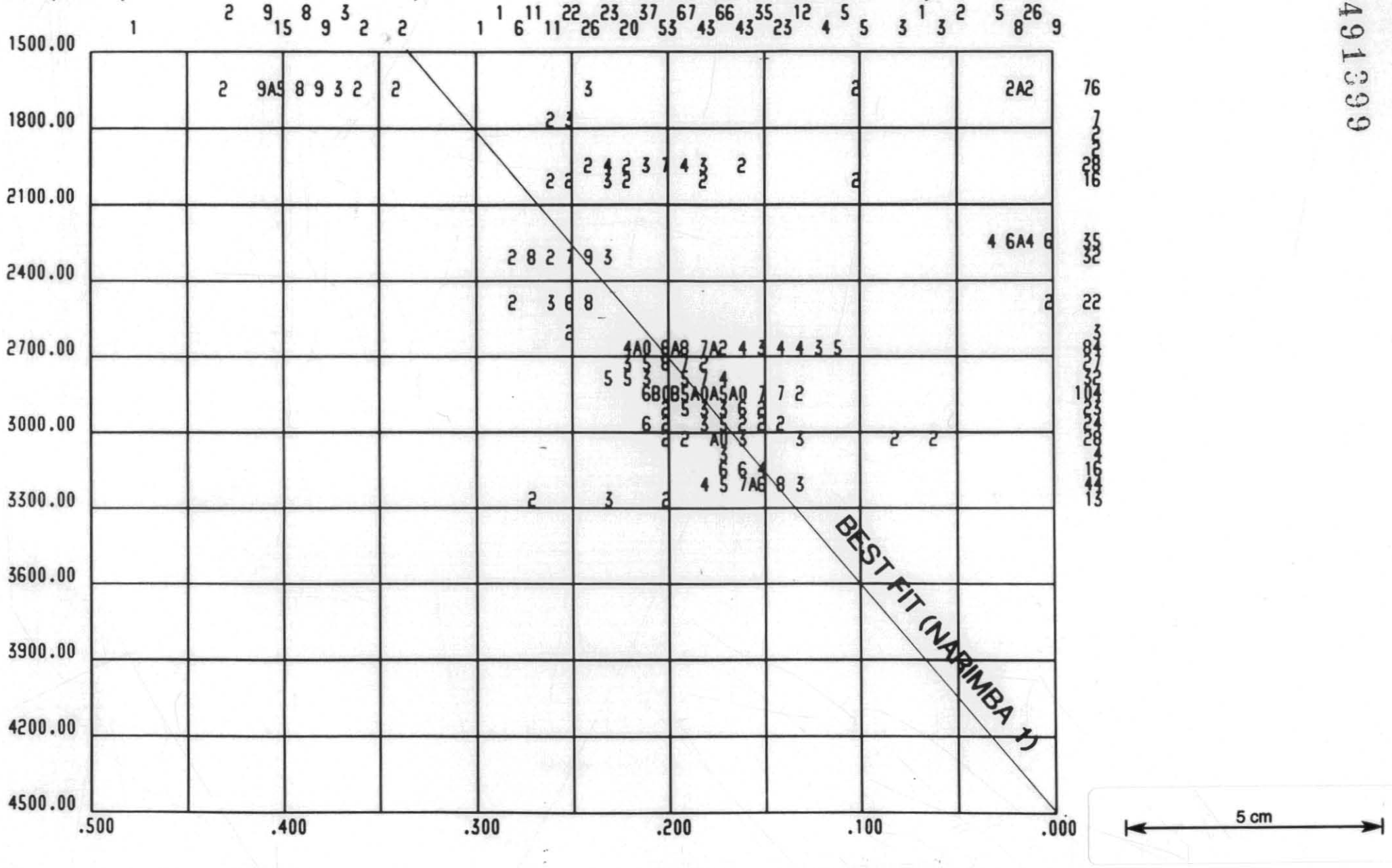
X Axis: PHI-DT Y Axis: DEPTH 695 of 10516 Pts plotted

Constraints: GR SS (PE

4913393

Well Name: TILANA 1 TLOG - 5.2 - FREQ - - 54

Frequency Plot Depth: 1640.00 to 3800.00 by .15 meters



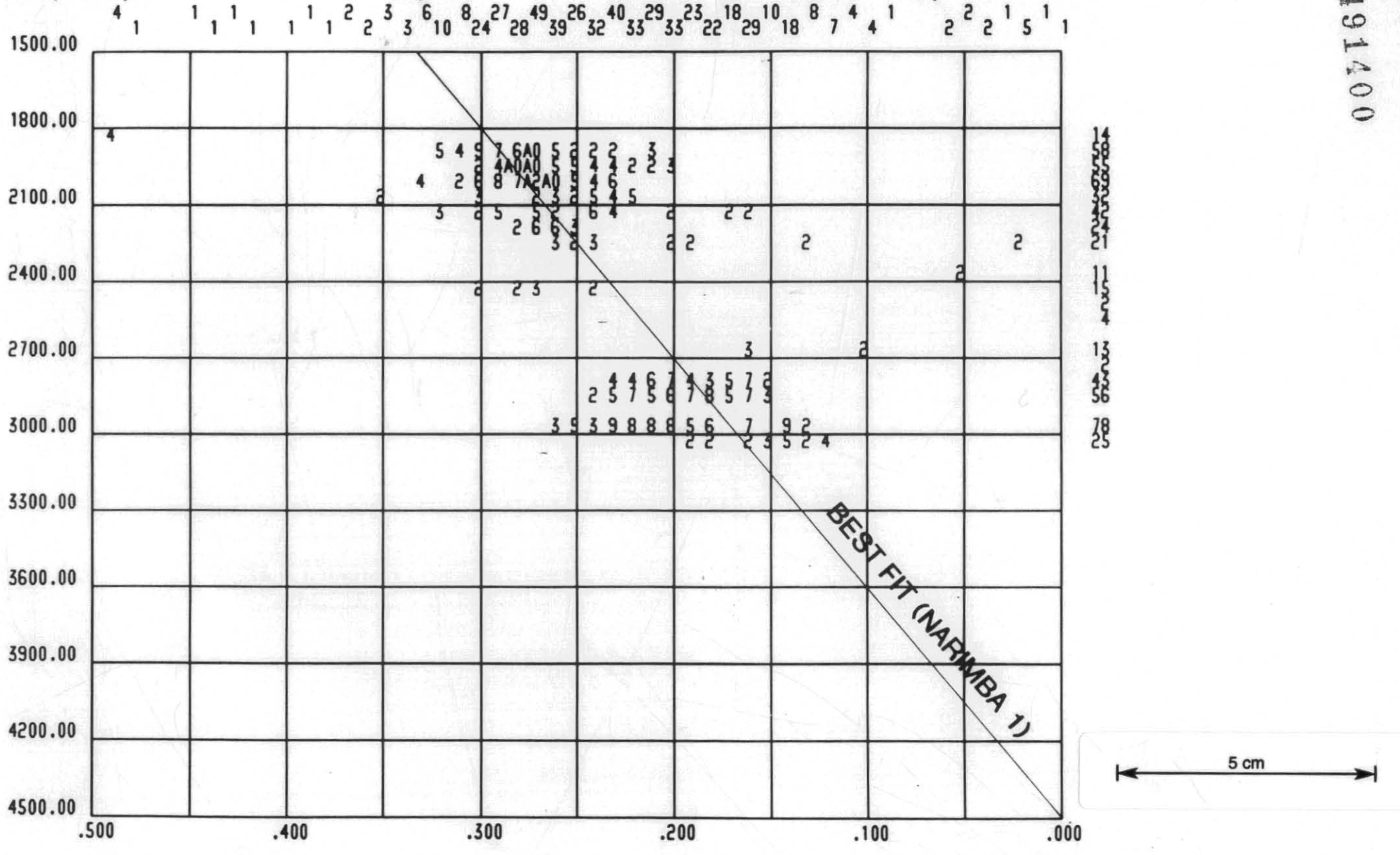
X Axis: PHI-DT Y Axis: DEPTH 622 of 14174 Pts plotted

Constraints: GR SS (PE

4913399

Well Name: YOLLA 1 TLOG - 5.2 - FREQ - - 32

Frequency Plot Depth: 1740.00 to 3360.72 by .15 meters



491400

X Axis: PHI-DT Y Axis: DEPTH 564 of 10636 Pts plotted

Constraints: GR SS (PE

MRC9407005

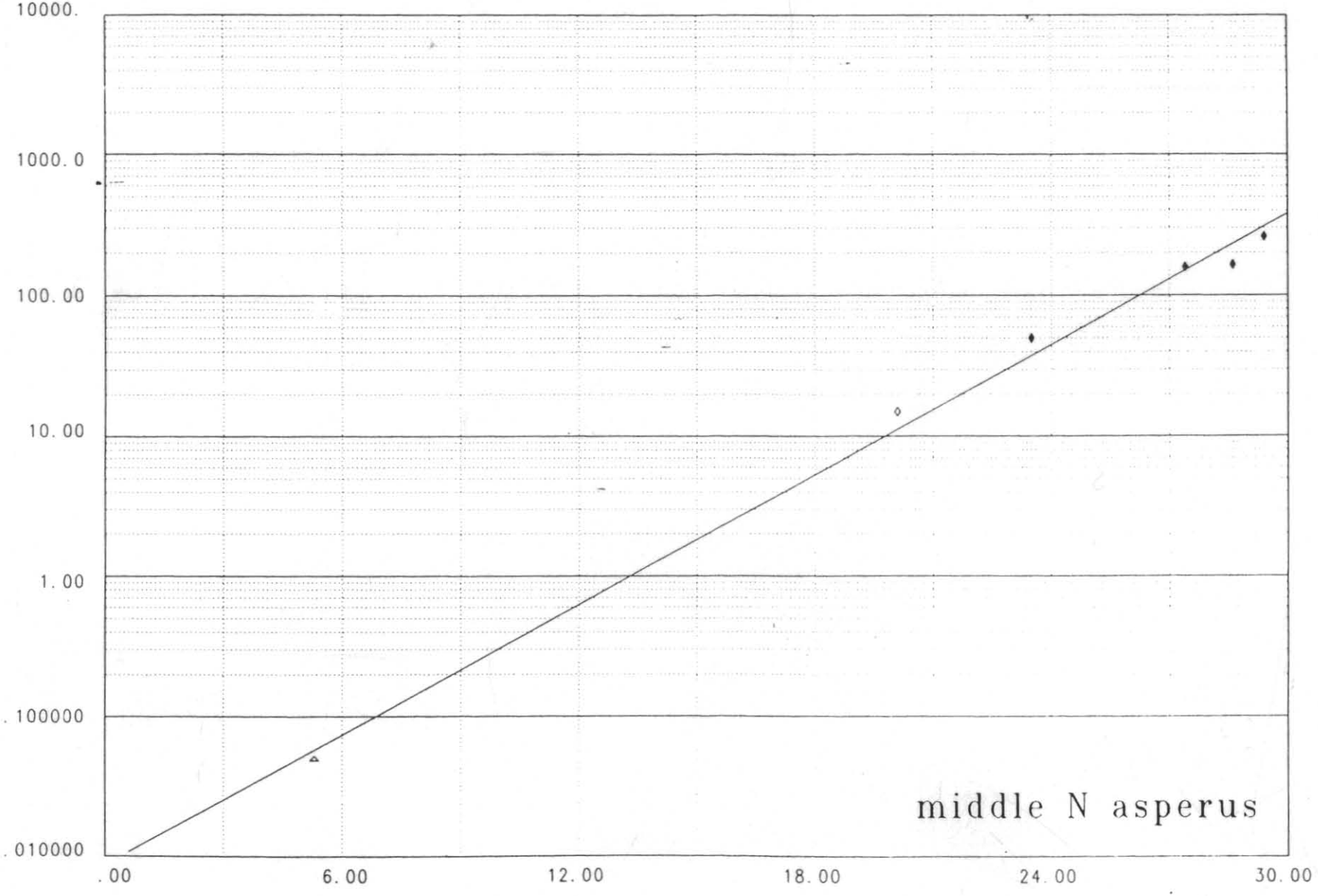
491401

APPENDIX 3

POROSITY - PERMEABILITY CROSS PLOTS BY AGE

Multiple We)ross Plot 5 cm TS - 5.43 - RX - - 79

Regression of X vs Y Slope: .1546 Incpt: -2.0603 Corr Coef: .9968



X Axis: COREPOR Y Axis: COREPERM 6 of 11105 Pts plotted

Constraints: COREAGE

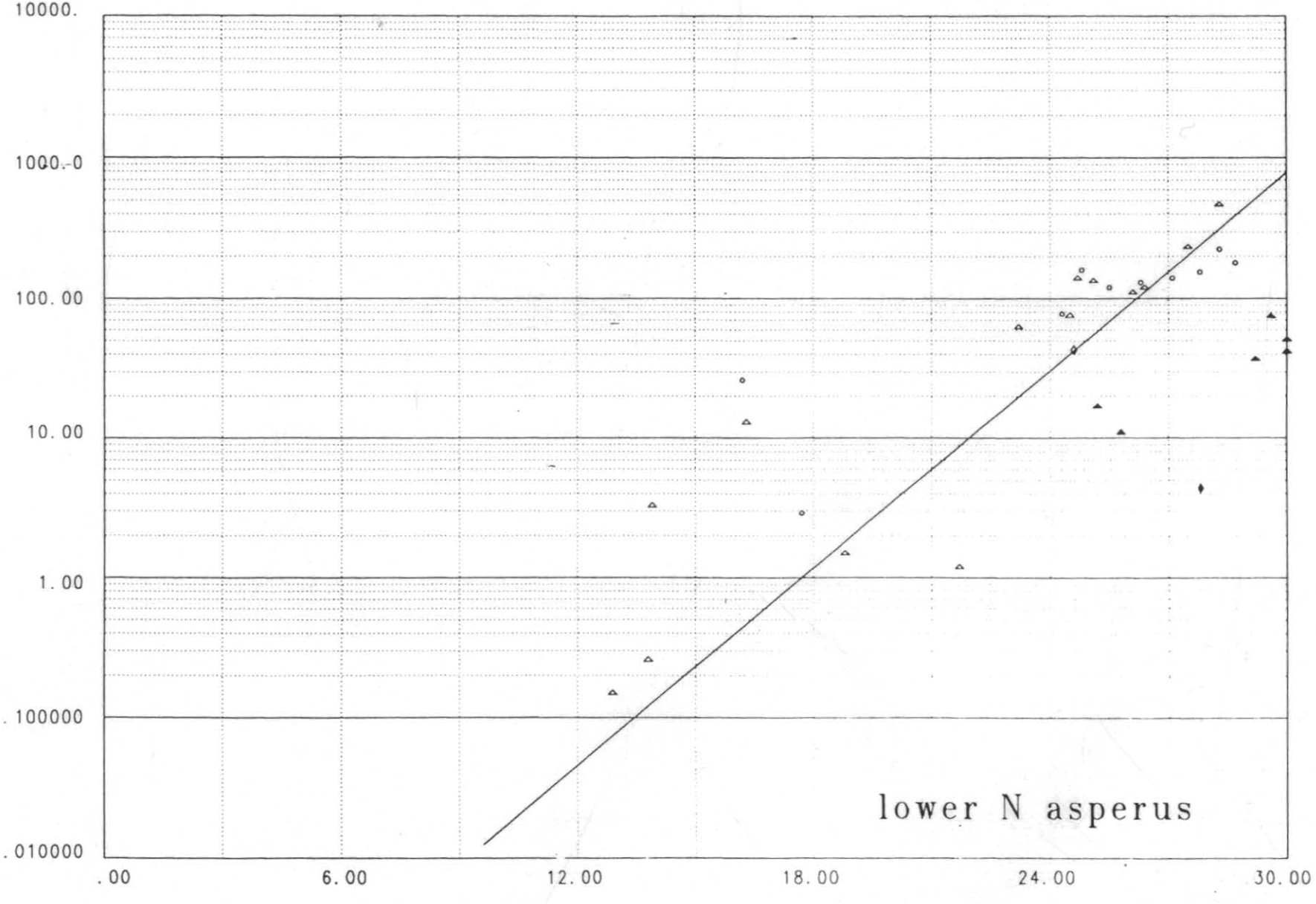
491402

Multiple Well Cross Plot

5 cm

TS - 5.43 - RX - - 69

Regression of X vs Y Slope: .2354 Incpt: -4.1639 Corr Coef: .7475



X Axis: COREPOR Y Axis: COREPERM 33 of 11105 Pts plotted

Constraints: COREAGE

491403

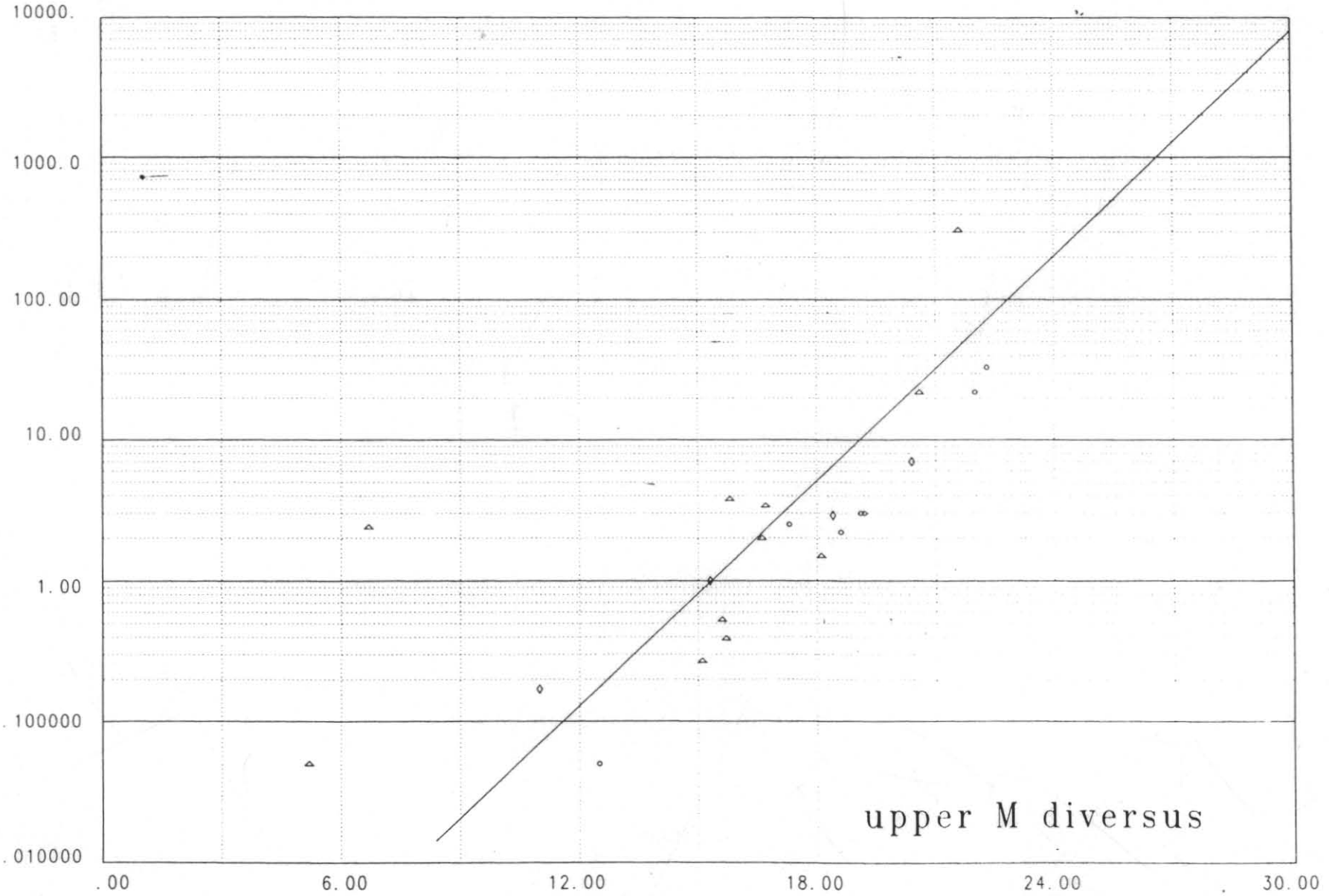
Multiple Well Cross Plot

5 cm

TS - 5.43 - RX - - 99

Regression of X vs Y Slope: .2662 Incpt: -4.0819 Corr Coef: .7524

491404

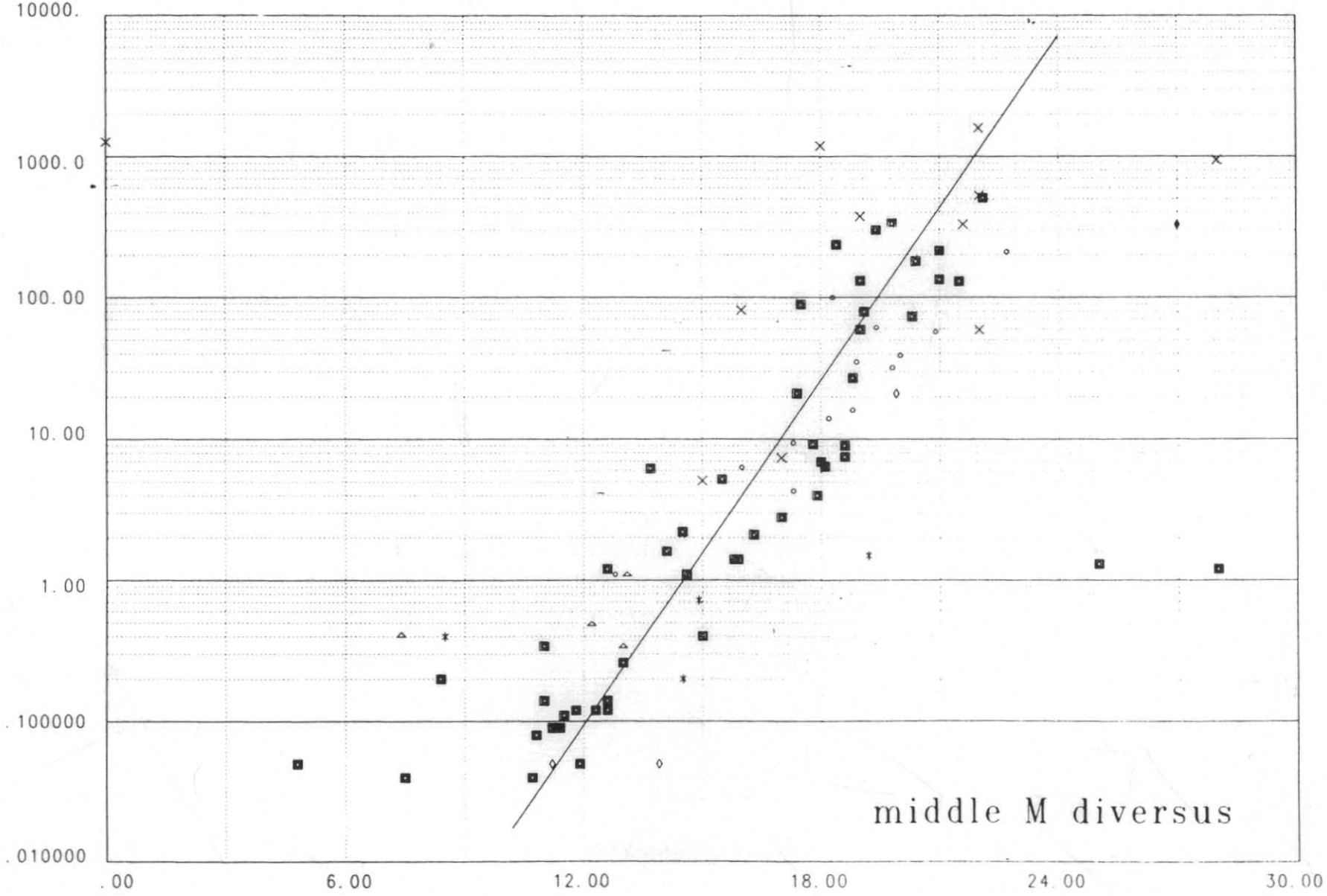


X Axis: COREPOR Y Axis: COREPERM 22 of 11105 Pts plotted

Constraints: COREAGE

Multiple We Cross Plot 5 cm TS - 5.43 - RX - -109

Regression of X vs Y Slope: .4067 Incpt: -5.9046 Corr Coef: .6631



X Axis: COREPOR Y Axis: COREPERM 87 of 11105 Pts plotted

Constraints: COREAGE

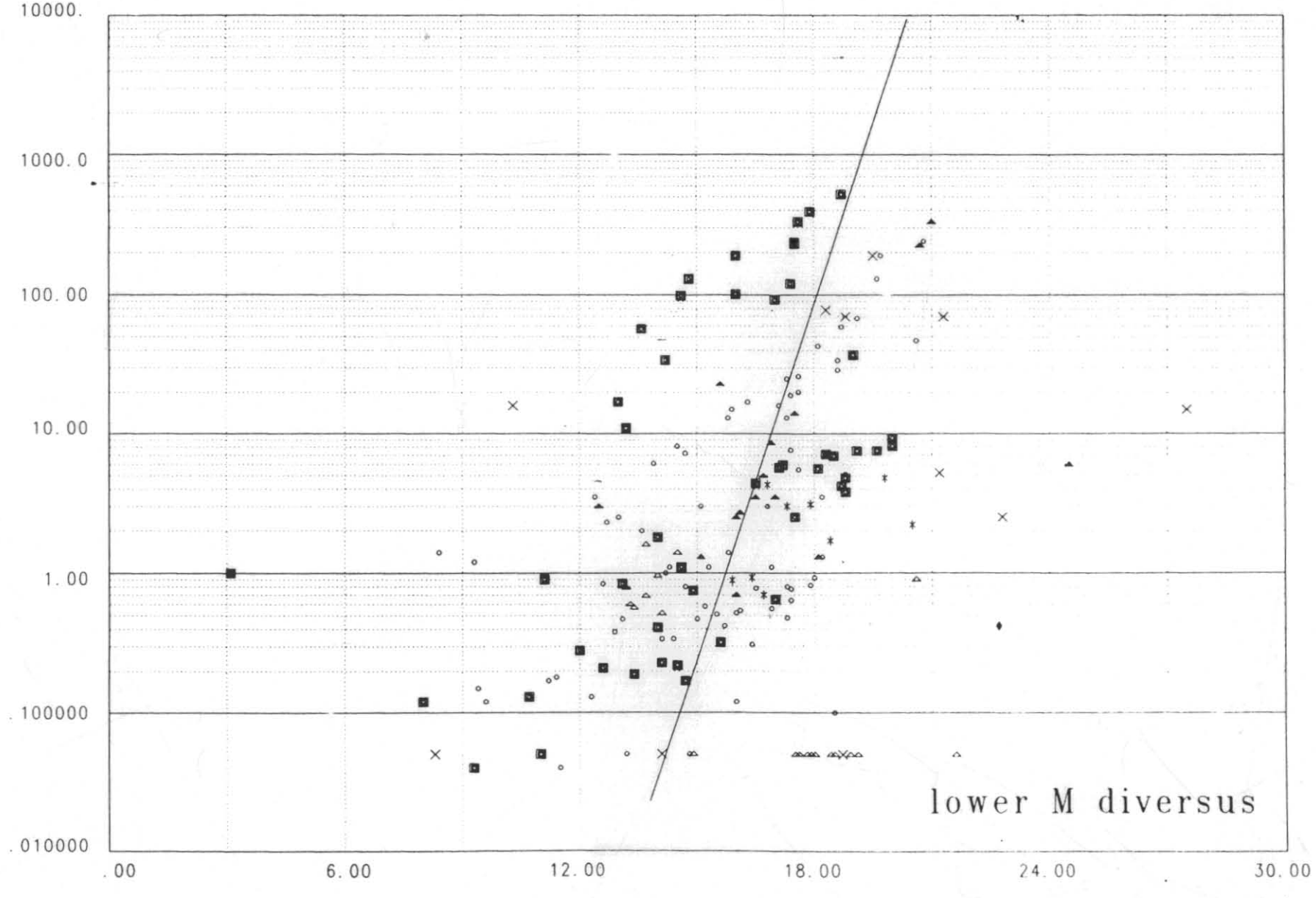
491405

Multiple We. Cross Plot

5 cm

TS - 5.43 - RX - -119

Regression of X vs Y Slope: .8506 Incpt: -13.3774 Corr Coef: .3791



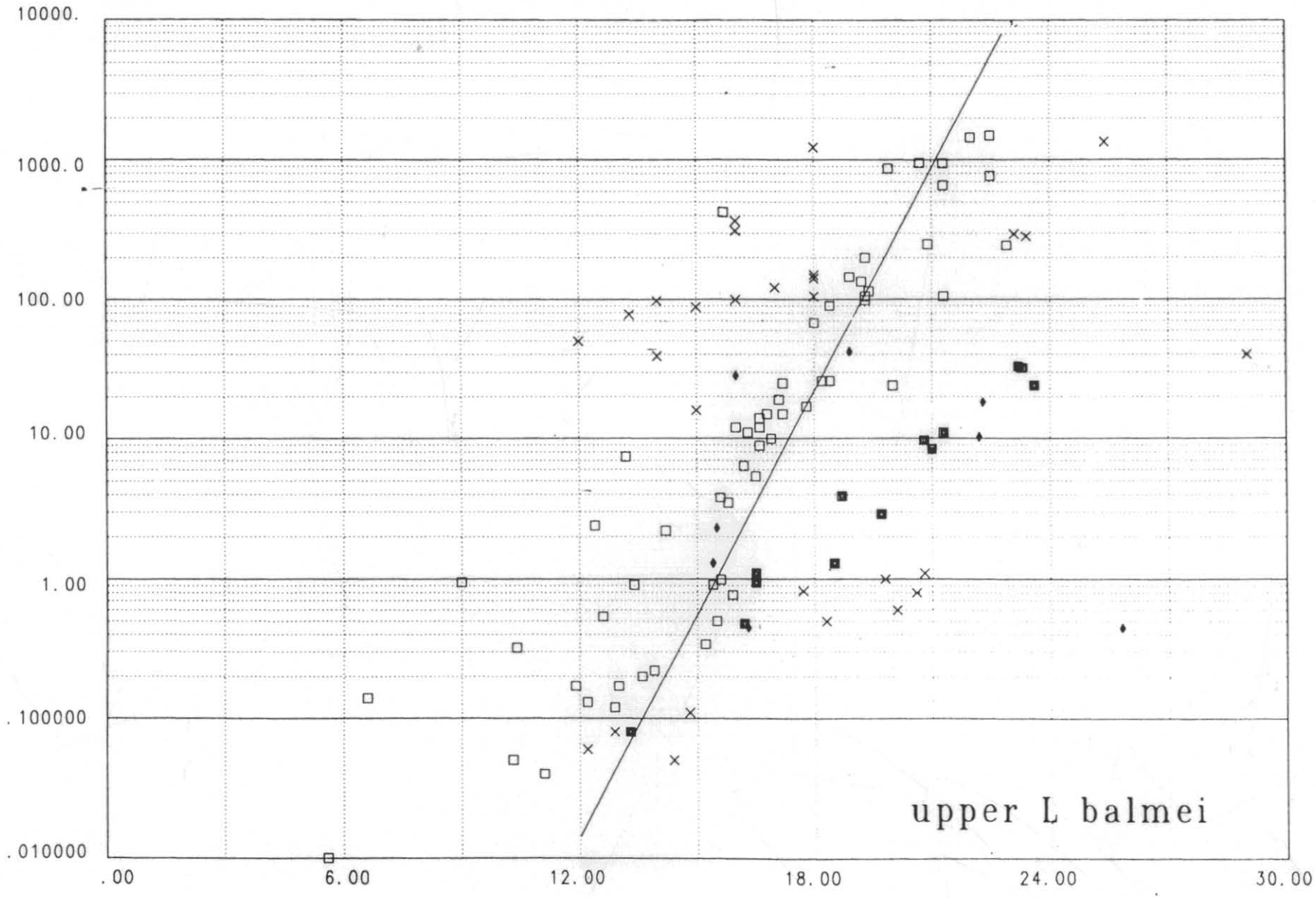
X Axis: COREPOR Y Axis: COREPERM 179 of 11105 Pts plotted

Constraints: COREAGE

491406

Multiple W Cross Plot 5 cm TS - 5.43 - RX - -129

Regression of X vs Y Slope: .5325 Incpt: -8.2340 Corr Coef: .5995



X Axis: COREPOR Y Axis: COREPERM 108 of 11105 Pts plotted

Constraints: COREAGE

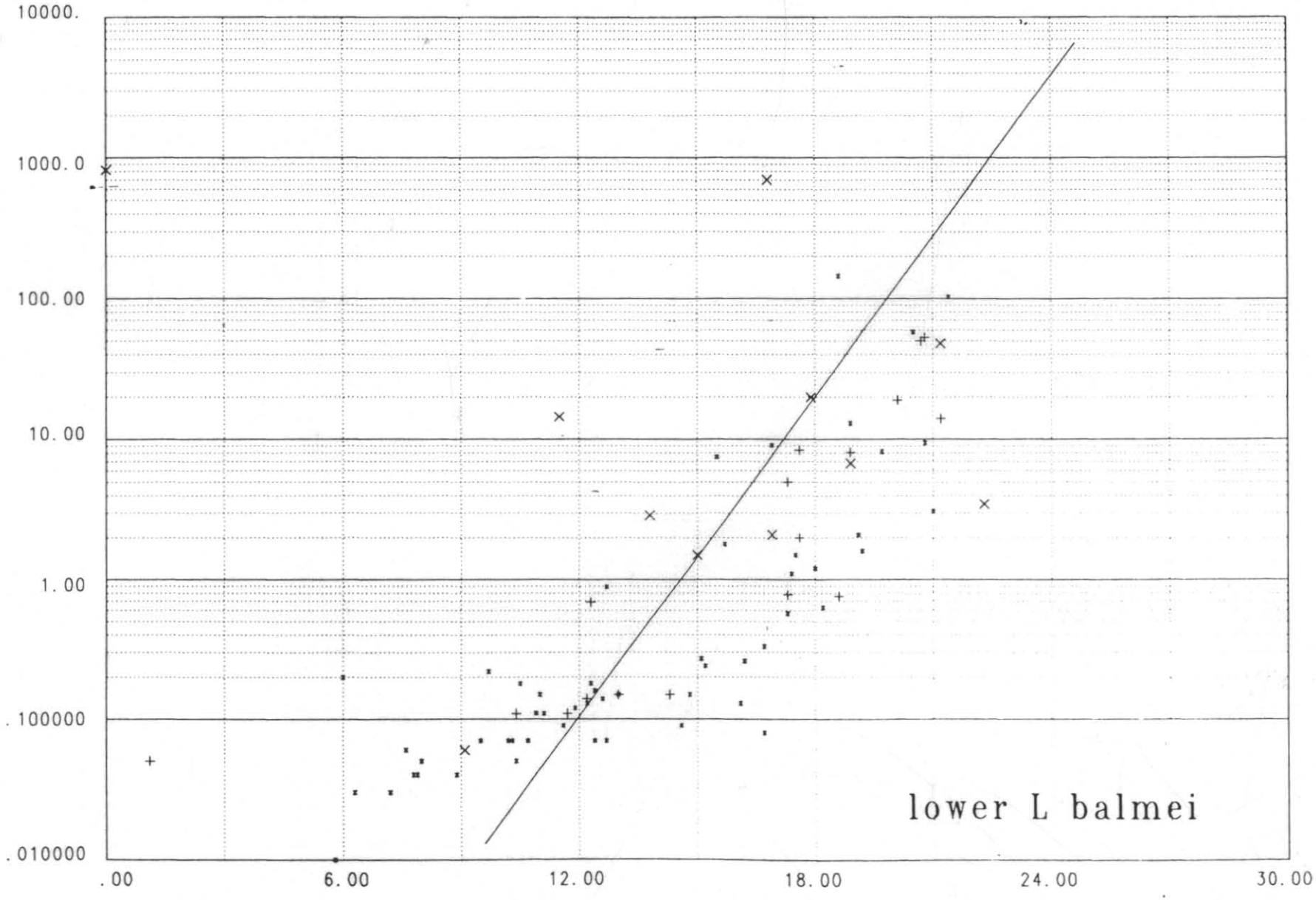
491407

Multiple We. Cross Plot

5 cm

TS - 5.43 - RX - -141

Regression of X vs Y Slope: .3801 Incpt: -5.5337 Corr Coef: .6059



X Axis: COREPOR Y Axis: COREPERM 82 of 11105 Pts plotted

Constraints: COREAGE

491408

491409

APPENDIX 4

POROSITY - PERMEABILITY CROSS PLOTS BY DEPOSITIONAL FACIES

SAGASCO Resources Ltd.

491410

LEGEND

WELL NAME		WELL NAME	
BASS 1		PELICAN 5	*
AROO 1		PIPIPA 1	*
BASS 2		POONBOON 1	*
CORMORANT 1		TAROOK 1	
DURROON 1		TILANA 1	
NANGKERO 1		TOOLKA 1A	
NARIMBA 1	*	YOLLA 1	
PELICAN 1	*	YURONGI 1	
PELICAN 2	*	BASS 3	
PELICAN 3	*	DONDU 1	
PELICAN 4	*	* T/25P	

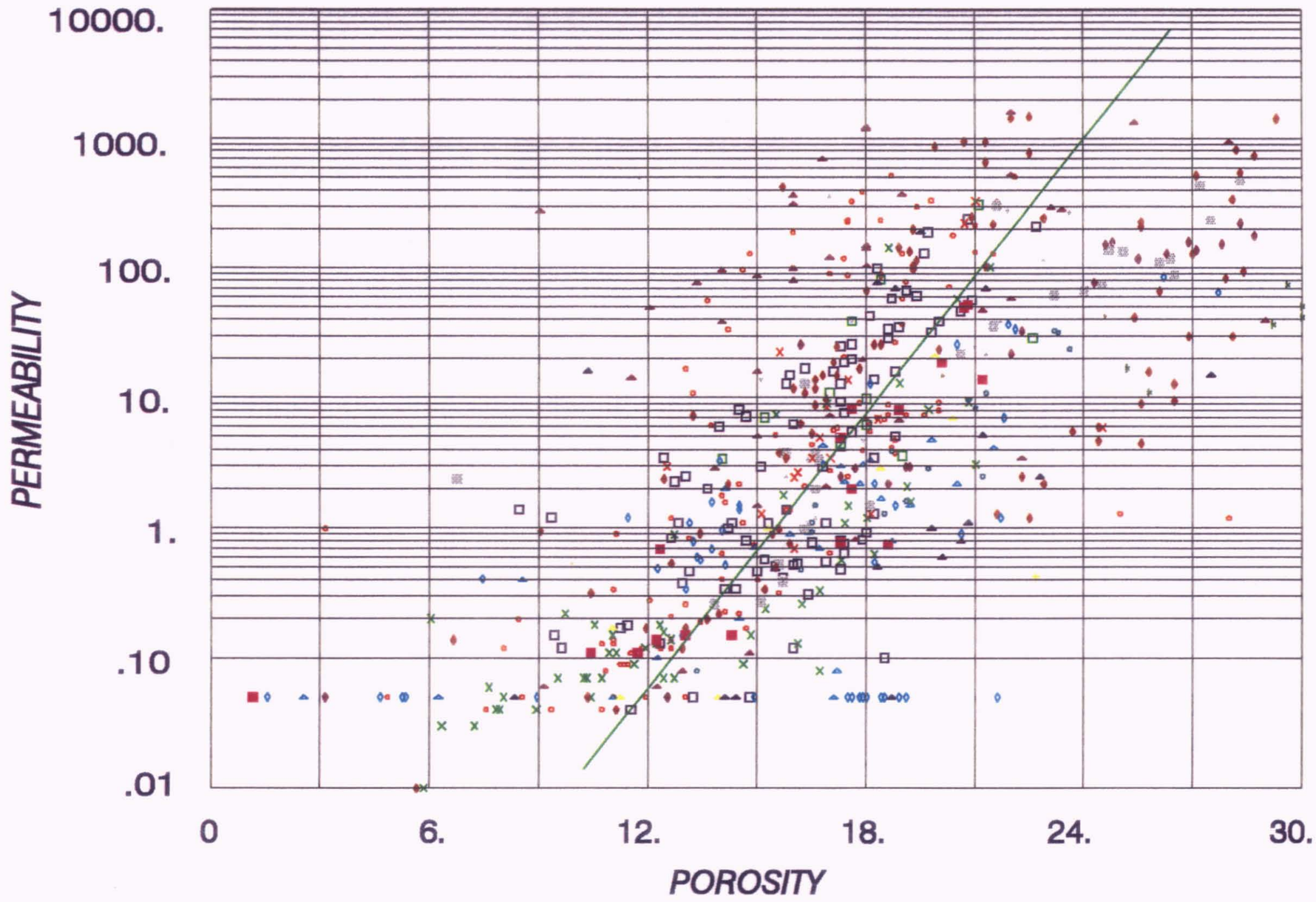
DKTT25.0794.PRS

SAGASCO Resources Ltd.

491411

A. ALL EASTERN VIEW COAL MEASURE DATA

Multiple Well Cross Plot



DKTT25.0794.PRS

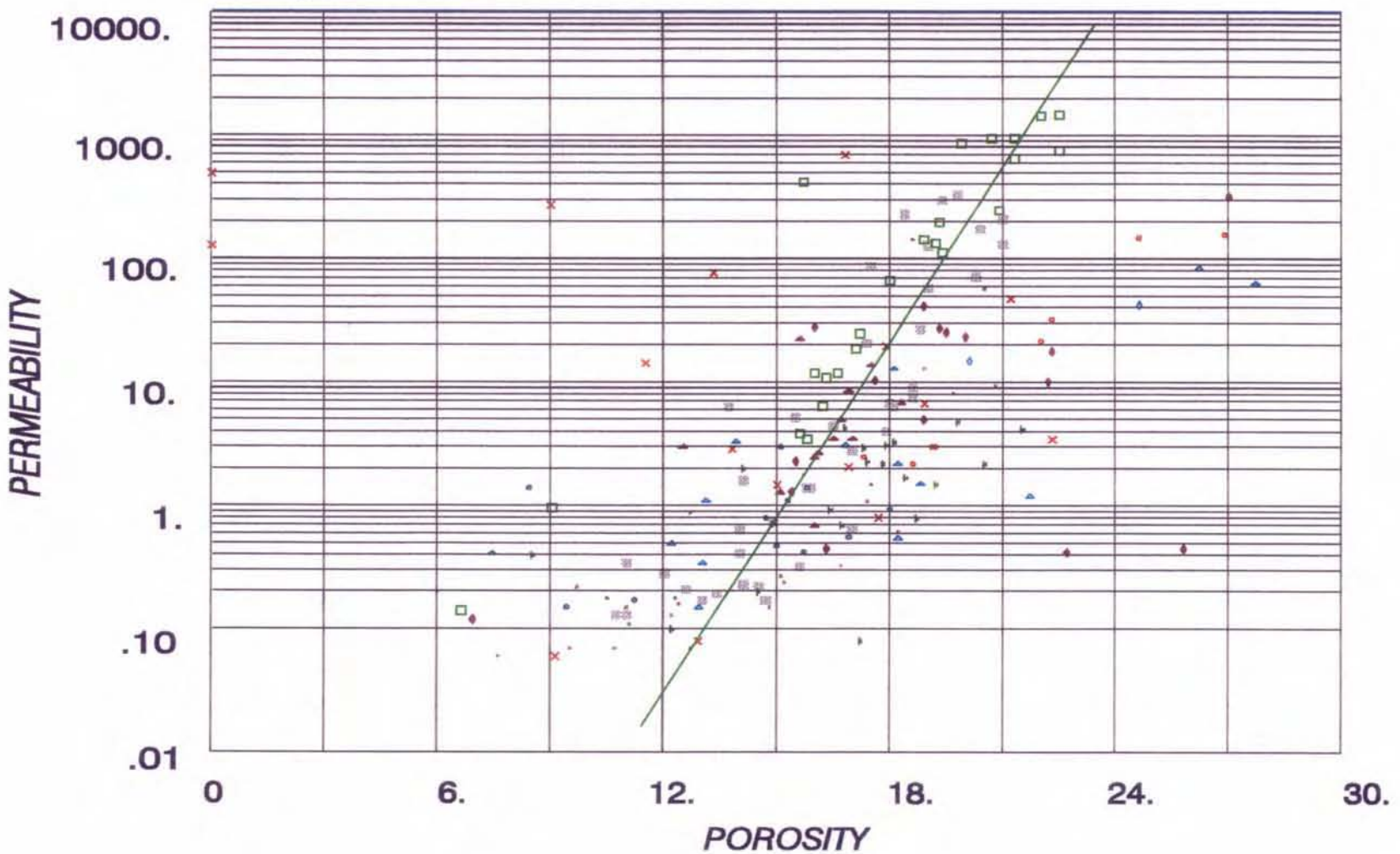
5 cm

SAGASCO Resources Ltd.

B. OVERBANK FACIES

5 cm

Multiple Well Cross Plot



DKTT25.0794.PRS

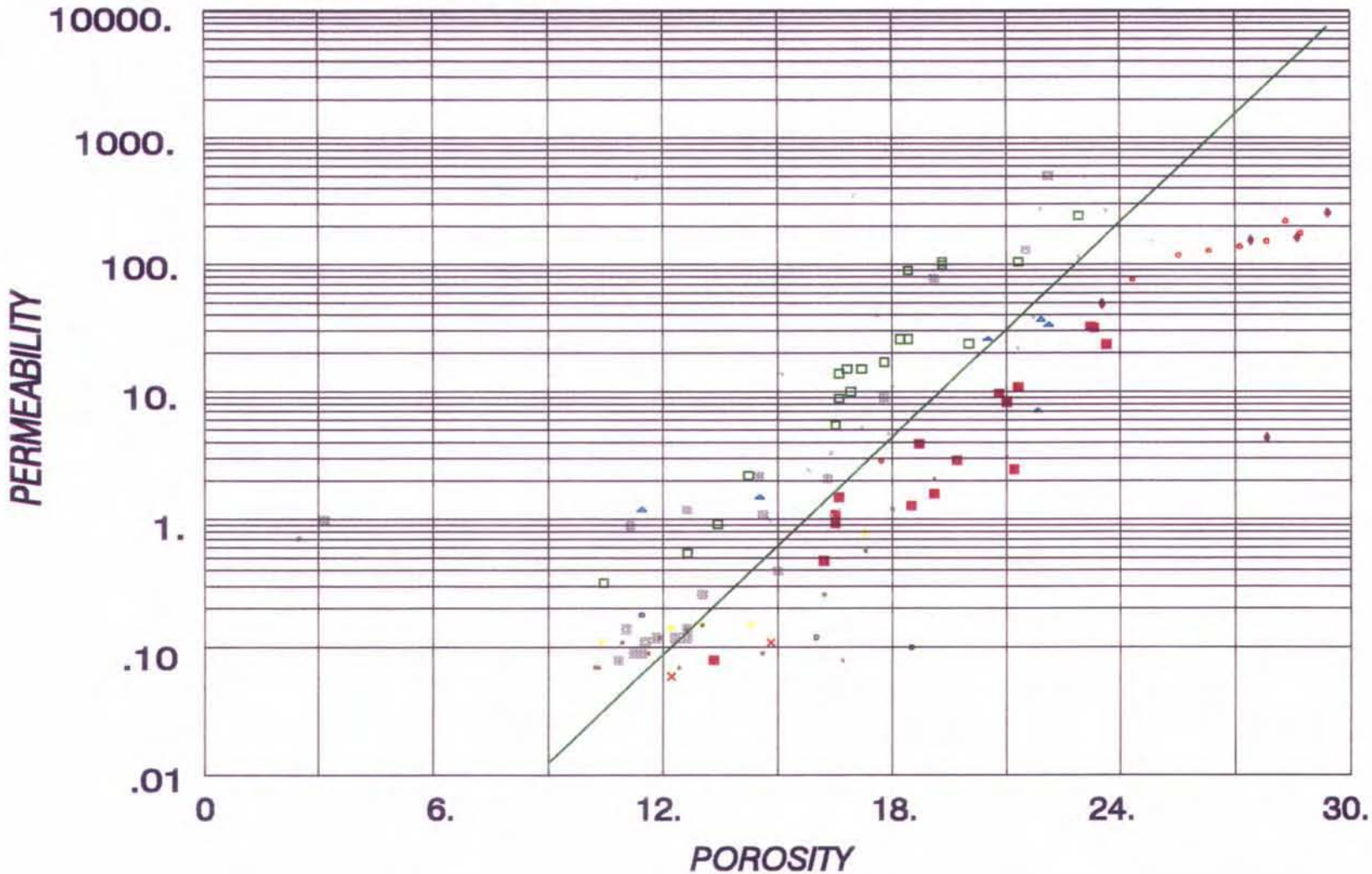
491/112

SAGASCO Resources Ltd.

C. SHORE FACE FACIES

5 cm

Multiple Well Cross Plot



DKTT25.0794.PRS

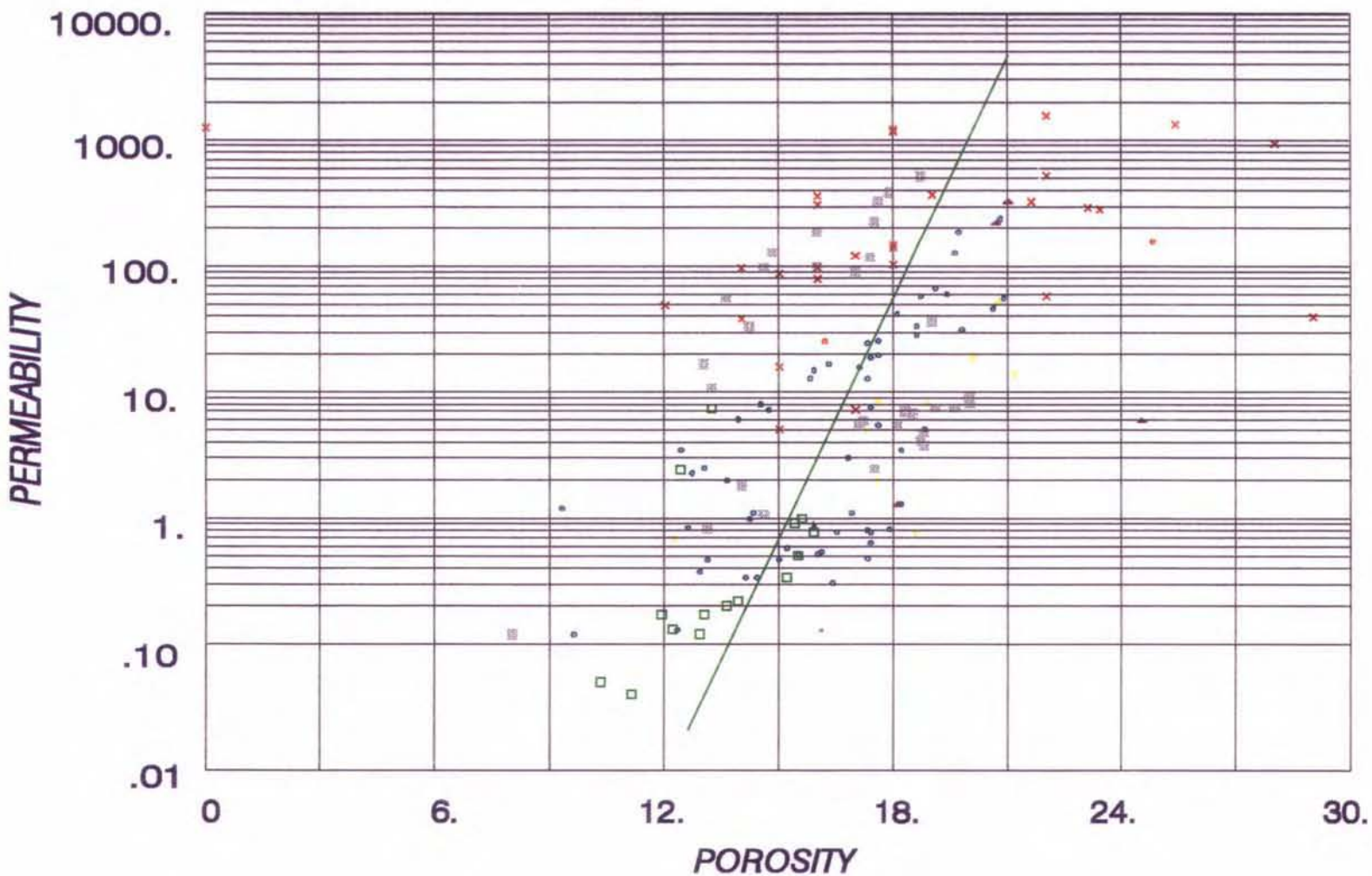
491413

SAGASCO
Resources Ltd.

D. FLUVIAL CHANNEL FACIES

5 cm

Multiple Well Cross Plot



DKTT25.0794.PRS

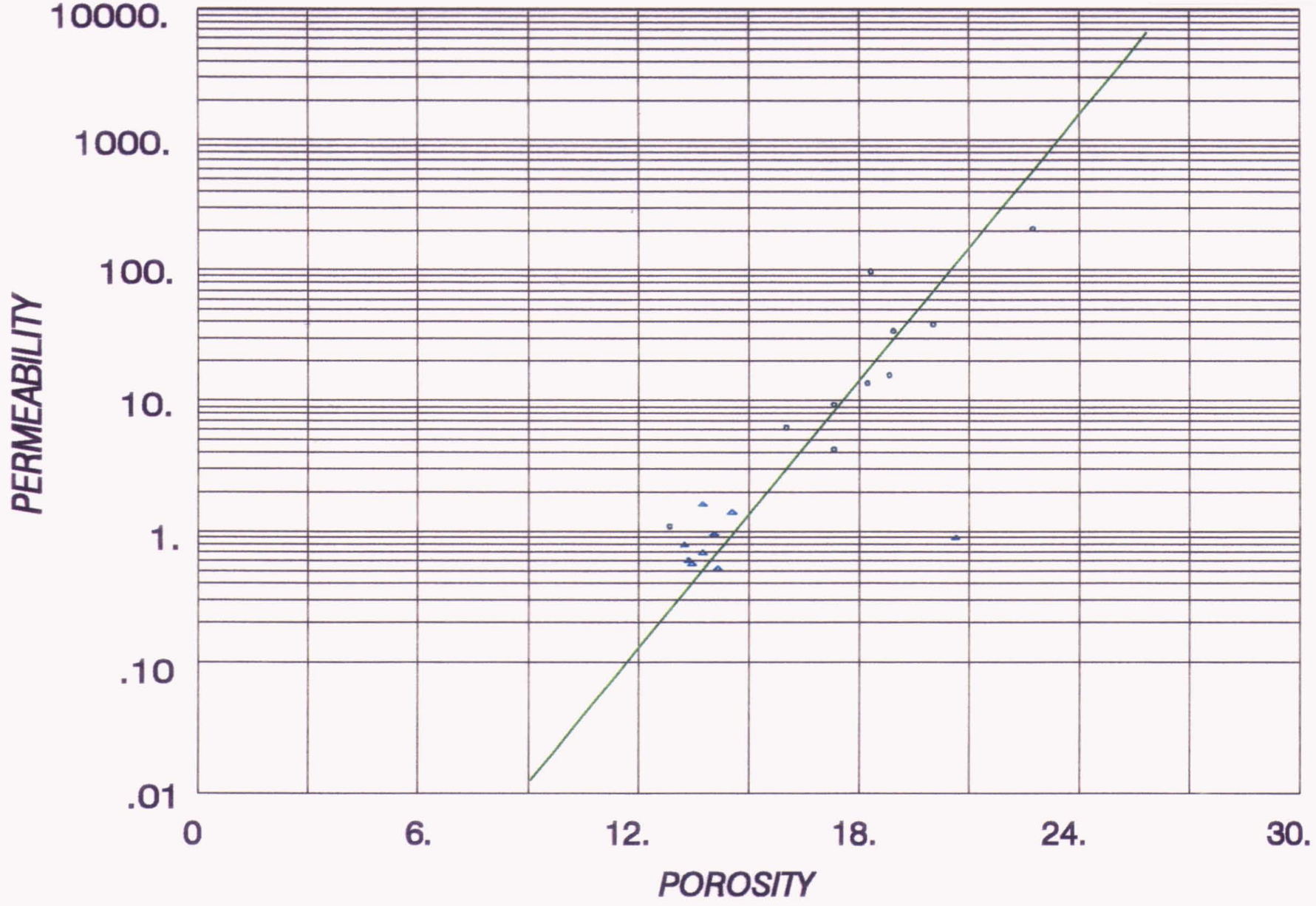
491414

SAGASCO Resources Ltd.

E. LAGOONAL DELTA FACIES

Multiple Well Cross Plot

5 cm



DKTT25.0794.PRS

491/415

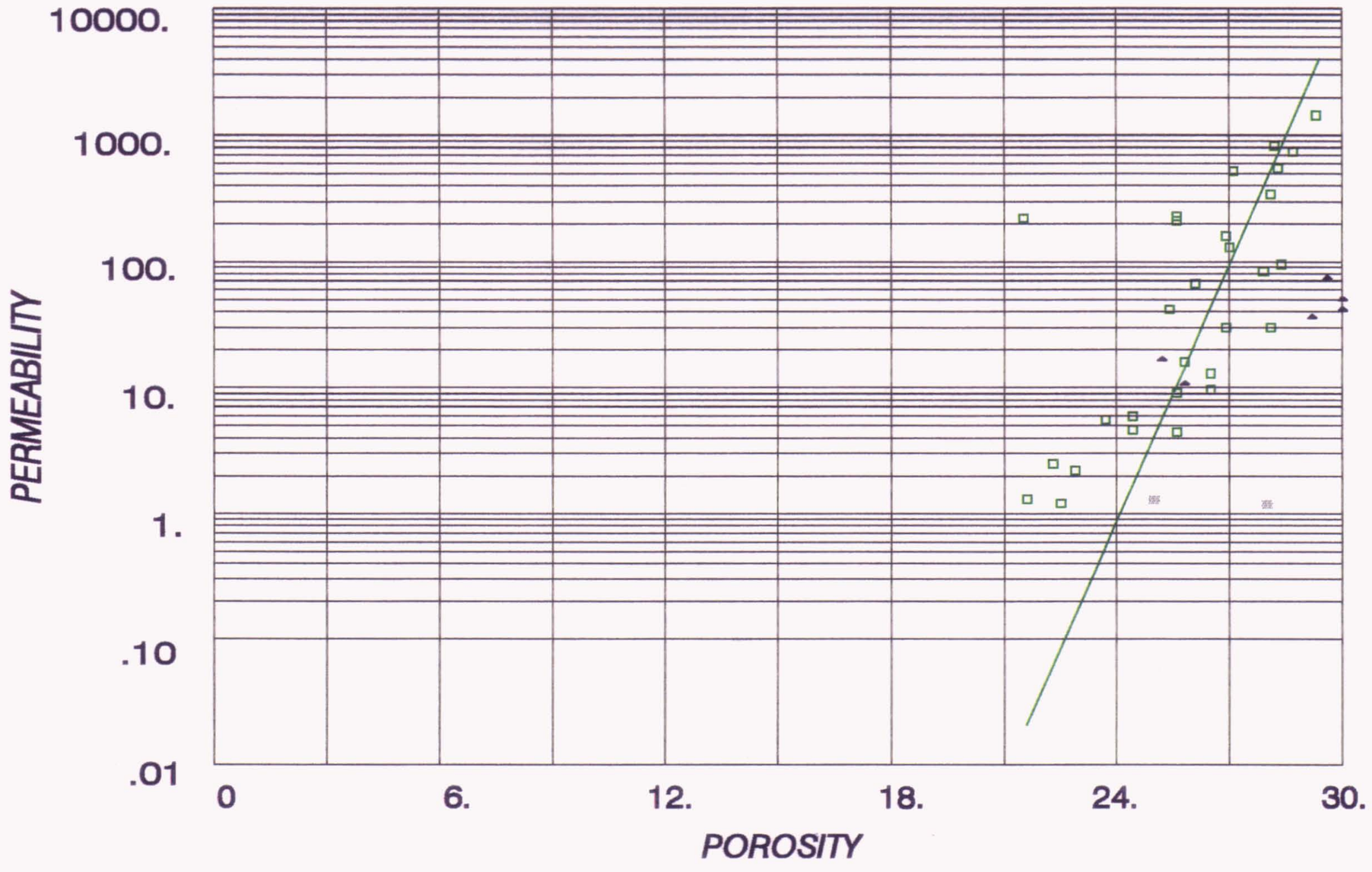
5 cm

SAGASCO Resources Ltd.

491416

F. SHALLOW SUBAQUEOUS SAND SHEETS

Multiple Well Cross Plot



DKTT25.0794.PRS

APPENDIX 5

HYDROCARBON SHOW EVALUATION

MRC9407005

The following codes are used in the show evaluation reports:

1 Depth Interval: Depth interval of show in KB depth

2 F/M: Units of depth - feet or metres

3 L/D: Logger's or driller's depth used in item (1)

4 T: Type of show indicated by the following abbreviation:

G - Gas show
O - Oil show
H - Oil and Gas show ('hydrocarbon')

5 R: Rating of show. This is a qualitative assessment of the show, based on the following categories:

1 Trace
2 Trace to Poor
3 Poor = Weak
4 Poor to Fair
5 Fair = Moderate
6 Fair to Good
7 Good = Strong

6 VP: Visual porosity estimate. Taken generally from the mudlog lithological description, and based on the following categories:

0 No visual porosity = non-porous
1 Tight = v.poor, trace, v.week
2 Tight = low
3 Tight or Poor = minor, weak, small
4 Poor to Fair =
5 Fair = moderate, medium
6 Fair to Good
7 Good

7 HW: Hot wire units. This is a code to indicate the calibration of the hot wire gas detector.

1	1 unit = 0.1%	(= 1000 ppm) methane
2	1 unit = 0.2%	(= 2000 ppm) methane
3	1 unit = 0.02%	(= 200 ppm) methane
4	1 unit = 0.05%	(= 500 ppm) methane
5	1 unit = 0.022%	(= 220 ppm) methane
6	1 unit = 0.033%	(= 330 ppm) methane
7	1 unit = 0.01%	(= 100 ppm) methane

If this value is not found, the code is "Q".

8 Source: This is the nature of the source document from which the information was derived.

Code	Meaning
HW	Hot wire. Used only for shows inferred from the hot wire curve. If the show is reported specifically in the mudlog, then ML is used.
ML	Mudlog
CL	Composite log. Used only if the mudlog is not available.
WCR	Well Completion Report. Used only if no mudlog or composite logs are available.
NS	No shows at all for this well.

9 Hot Wire - Total: This is the total reading of the hot wire (total gas) test, as recorded on the mudlog in "units" (see item (7) for definition of the hot wire units). The peak value will be recorded. Note that a hot wire peak is not coded as a show if it is associated with a coal.

10 Hot Wire - Background This is the lowest hot wire reading in the vicinity of the show, ie just outside the show interval.

11 C1, C2, C3, C4, C5 These are the highest Gas Chromatograph readings of the show interval, expressed in parts per million. These figures represent the composition of hydrocarbon.

C1	Methane
C2	Ethane
C3	Propane
C4	Butane
C5	Pentane

12 Cuttings - Total Gas and Methane: This is the total gas reading and total methane reading from the cuttings analysis, as recorded on the mudlog in "units".

MRC940)-ACM

491420

WELL NAME FLINDERS 1	FORMATION EVCM							DRILLING FLUIDS							CUTTINGS	
DEPTH INTERVAL	F/M	L/D	T	R	VP	HW	SOURCE	HOT WIRE		CHROMATOGRAPHIC ANALYSIS (PPM)					TOTAL GAS	TOTAL METHANE
								TOTAL	BACKGROUND	C1	C2	C3	C4	C5		
2070 - 2075	M	D	D					5	0	200	100	40				

LITHOLOGICAL DESCRIPTION:

DESCRIPTION OF FLUORESCENCE: ☐ No fluorescence

Percent sample with fluorescence	trace	10	20	30	40	50	60	70	80	>90
Fluorescence appearance	trace		spotted			streaked		patchy		solid
Brightness of fluorescence	v.dull		dull		dim			bright	v.bright	glowing
Colour of fluorescence	blue-white		white		green		yellow	gold (orange)		brown
Type of cut	trace	v.slow crush cut	crush cut	instant crush cut	v.slow streaming cut	slow stream	moderate streaming	streaming	fast streaming	instant
Colour of Cut	colourless		pale yellow	yellow	dark yellow	light orange	orange	dark brown		very dark brown opaque
Residue on spot plate	trace	heavy trace	v.thin ring	thin ring	thick ring	v.thick ring	thin film	thin film	thick film	solid

HYDROCARBON RECOVERY (FIT, DST RESULTS):

WELL NAME FLINDERS 1	FORMATION EVCM							DRILLING FLUIDS							CUTTINGS	
DEPTH INTERVAL	F/M	L/D	T	R	VP	HW	SOURCE	HOT WIRE		CHROMATOGRAPHIC ANALYSIS (PPM)					TOTAL GAS	TOTAL METHANE
								TOTAL	BACKGROUND	C1	C2	C3	C4	C5		
2004 - 2012	M	D	O		4		ML	3	1	220	200	50				

LITHOLOGICAL DESCRIPTION:

DESCRIPTION OF FLUORESCENCE: ☐ No fluorescence

Percent sample with fluorescence	trace	10	20	30	40	50	60	70	80	>90
Fluorescence appearance	trace		spotted			streaked		patchy		solid
Brightness of fluorescence	v.dull		dull		dim			bright	v.bright	glowing
Colour of fluorescence	blue-white		white		green		yellow	gold (orange)		brown
Type of cut	trace	v.slow crush cut	crush cut	instant crush cut	v.slow streaming cut	slow stream	moderate streaming	streaming	fast streaming	instant
Colour of Cut	colourless	milky white	pale yellow	yellow	dark yellow	light orange	orange	dark brown		very dark brown opaque
Residue on spot plate	thin trace	heavy trace	v.thin ring	thin ring	thick ring	v.thick ring	thin film	thin film	thick film	solid

HYDROCARBON RECOVERY (FIT, DST RESULTS):

WELL NAME NARIMBA 1	FORMATION EVCM							DRILLING FLUIDS							CUTTINGS	
DEPTH INTERVAL	F/M	L/D	T	R	VP	HW	SOURCE	HOT WIRE		CHROMATOGRAPHIC ANALYSIS (PPM)					TOTAL GAS	TOTAL METHANE
								TOTAL	BACKGROUND	C1	C2	C3	C4	C5		
6200 - 6260	F	L	H	1	1	6	WCR	2	2	1400						

LITHOLOGICAL DESCRIPTION: SST: white, vf grained, sub-ang, fair sorting, some dolomitic, hard, tight

DESCRIPTION OF FLUORESCENCE: ☐ No fluorescence

Percent sample with fluorescence	trace	10	20	30	40	50	60	70	80	>90
Fluorescence appearance	trace		spotted			streaked		patchy		solid
Brightness of fluorescence	v.dull		dull		dim			bright	v.bright	glowing
Colour of fluorescence	blue-white		white		green	yellow		gold (orange)		brown
Type of cut	trace	v.slow crush cut	crush cut	instant crush cut	v.slow streaming cut	slow stream	moderate streaming	streaming	fast streaming	instant
Colour of Cut	colourless		pale yellow	yellow	dark yellow	light orange	orange	dark brown		very dark brown opaque
Residue on spot plate	trace	heavy trace	v.thin ring	thin ring	thick ring	v.thick ring	thin film	thin film	thick film	solid

HYDROCARBON RECOVERY (FIT, DST RESULTS):

WELL NAME NARIMBA 1	FORMATION EVCM							DRILLING FLUIDS							CUTTINGS	
DEPTH INTERVAL	F/M	L/D	T	R	VP	HW	SOURCE	HOT WIRE		CHROMATOGRAPHIC ANALYSIS (PPM)					TOTAL GAS	TOTAL METHANE
								TOTAL	BACKGROUND	C1	C2	C3	C4	C5		
7310 - 7370	F	L	O	1	7	6	WCR	3	3	350						

LITHOLOGICAL DESCRIPTION: SST: dolomitic in part, calc, light grey, v fine-silty with fine carb mica, laminae, friable

DESCRIPTION OF FLUORESCENCE: ☐ No fluorescence

Percent sample with fluorescence	trace	10	20	30	40	50	60	70	80	>90
Fluorescence appearance	trace		spotted			streaked		patchy		solid
Brightness of fluorescence	v.dull		dull		dim			bright	v.bright	glowing
Colour of fluorescence	blue-white		white		green	yellow		gold (orange)		brown
Type of cut	trace - none	v.slow crush cut	crush cut	instant crush cut	v.slow streaming cut	slow stream	moderate streaming	streaming	fast streaming	instant
Colour of Cut	colourless		pale yellow	yellow	dark yellow	light orange	orange	dark brown		very dark brown opaque
Residue on spot plate	trace	heavy trace	v.thin ring	thin ring	thick ring	v.thick ring	thin film	thin film	thick film	solid

HYDROCARBON RECOVERY (FIT, DST RESULTS):

WELL NAME NARIMBA 1	FORMATION EVCM							DRILLING FLUIDS							CUTTINGS	
DEPTH INTERVAL	F/M	L/D	T	R	VP	HW	SOURCE	HOT WIRE		CHROMATOGRAPHIC ANALYSIS (PPM)					TOTAL GAS	TOTAL METHANE
								TOTAL	BACKGROUND	C1	C2	C3	C4	C5		
7570 - 7580	F	L	O	1	7	6	WCR	5	2	500						
7770 - 7810	F	L	O	1	7	6	WCR	2	2	500						
7990 - 8000	F	L	O	1	7	6	WCR	6	5	500						

LITHOLOGICAL DESCRIPTION:

1. SST, grading to siltst, f grained-vf grained, moderate sorting, with occ v thin carbonaceous laminea
2. SST, clear qtz grains, vf-v coarse grained, poorly std, sub-ang to sub-rnd, good P&P
3. SST, as above

NOTE: similar fluor for intervals

DESCRIPTION OF FLUORESCENCE: ☐ No fluorescence

Percent sample with fluorescence	trace	10	20	30	40	50	60	70	80	>90
Fluorescence appearance	trace		spotted			streaked		patchy		solid
Brightness of fluorescence	v.dull		dull		dim			bright	v.bright	glowing
Colour of fluorescence	blue-white		white		green	yellow		gold (orange)		brown
Type of cut	trace - none	v.slow crush cut	crush cut	instant crush cut	v.slow streaming cut	slow stream	moderate streaming	streaming	fast streaming	instant
Colour of Cut	colourless		pale yellow	yellow	dark yellow	light orange	orange	dark brown		very dark brown opaque
Residue on spot plate	trace	heavy trace	v.thin ring	thin ring	thick ring	v.thick ring	thin film	thin film	thick film	solid

HYDROCARBON RECOVERY (FIT, DST RESULTS):

WELL NAME NARIMBA 1	FORMATION EVCM							DRILLING FLUIDS							CUTTINGS	
DEPTH INTERVAL	F/M	L/D	T	R	VP	HW	SOURCE	HOT WIRE		CHROMATOGRAPHIC ANALYSIS (PPM)					TOTAL GAS	TOTAL METHANE
								TOTAL	BACKGROUND	C1	C2	C3	C4	C5		
8400 - 8470	F	D	O	1	4	6	ML	3	3	400						

LITHOLOGICAL DESCRIPTION: 1. SST, v silty, vf-med grained, clay matrix, trace of dark brown staining on qtz grains & dead oil residual?

DESCRIPTION OF FLUORESCENCE: ☐ No fluorescence

Percent sample with fluorescence	trace	10	20	30	40	50	60	70	80	>90
Fluorescence appearance	trace		spotted			streaked		patchy		solid
Brightness of fluorescence	v.dull		dull		dim			bright	v.bright	glowing
Colour of fluorescence	blue-white		white		green	yellow		gold (orange)		brown
Type of cut	trace	v.slow crush cut	crush cut	instant crush cut	v.slow streaming cut	slow stream	moderate streaming	streaming	fast streaming	instant
Colour of Cut	colourless		pale yellow	yellow	dark yellow	light orange	orange	dark brown		very dark brown opaque
Residue on spot plate	trace	heavy trace	v.thin ring	thin ring	thick ring	v.thick ring	thin film	thin film	thick film	solid

HYDROCARBON RECOVERY (FIT, DST RESULTS):

WELL NAME NARIMBA 1	FORMATION EVCM							DRILLING FLUIDS							CUTTINGS	
DEPTH INTERVAL	F/M	L/D	T	R	VP	HW	SOURCE	HOT WIRE		CHROMATOGRAPHIC ANALYSIS (PPM)					TOTAL GAS	TOTAL METHANE
								TOTAL	BACKGROUND	C1	C2	C3	C4	C5		
9660 - 9690	F	D	H	5	3	6	ML	70	5	3000	750	1300	1100	200	45	15

LITHOLOGICAL DESCRIPTION: 1. SST: white, f grained, firm, silty, sub-rnd, consol

DESCRIPTION OF FLUORESCENCE: ☐ No fluorescence

Percent sample with fluorescence	trace	10	20	30	40	50	60	70	80	>90
Fluorescence appearance	trace		spotted			streaked		patchy		solid
Brightness of fluorescence	v.dull		dull		dim			bright	v.bright	glowing
Colour of fluorescence	blue-white		white		green	yellow		gold (orange)		brown
Type of cut	trace	v.slow crush cut	crush cut	instant crush cut	v.slow streaming cut	slow stream	moderate streaming	streaming	fast streaming	instant
Colour of Cut	colourless		pale yellow	yellow	dark yellow	light orange	orange	dark brown		very dark brown opaque
Residue on spot plate	trace	heavy trace	v.thin ring	thin ring	thick ring	v.thick ring	thin film	thin film	thick film	solid

HYDROCARBON RECOVERY (FIT, DST RESULTS):

WELL NAME NARIMBA 1	FORMATION EVCM							DRILLING FLUIDS							CUTTINGS	
DEPTH INTERVAL	F/M	L/D	T	R	VP	HW	SOURCE	HOT WIRE		CHROMATOGRAPHIC ANALYSIS (PPM)					TOTAL GAS	TOTAL METHANE
								TOTAL	BACKGROUND	C1	C2	C3	C4	C5		
9720 - 9770	F	D	O	5		6	ML	20	8	1800	400	200				

LITHOLOGICAL DESCRIPTION: 1. SST: white, f-med grained, consol, sub-rnd qtz with few ang lithics, moderately friable

DESCRIPTION OF FLUORESCENCE: ☐ No fluorescence

Percent sample with fluorescence	trace	10	20	30	40	50	60	70	80	>90
Fluorescence appearance	trace		spotted			streaked		patchy		solid
Brightness of fluorescence	v.dull		dull		dim			bright	v.bright	glowing
Colour of fluorescence	blue-white		white		green	yellow		gold (orange)		brown
Type of cut	trace	v.slow crush cut	crush cut	instant crush cut	v.slow streaming cut	slow stream	moderate streaming	streaming	fast streaming	instant
Colour of Cut	colourless		pale yellow	yellow	dark yellow	light orange	orange	dark brown		very dark brown opaque
Residue on spot plate	trace	heavy trace	v.thin ring	thin ring	thick ring	v.thick ring	thin film	thin film	thick film	solid

HYDROCARBON RECOVERY (FIT, DST RESULTS):

WELL NAME NARIMBA 1	FORMATION EVCM							DRILLING FLUIDS							CUTTINGS	
DEPTH INTERVAL	F/M	L/D	T	R	VP	HW	SOURCE	HOT WIRE		CHROMATOGRAPHIC ANALYSIS (PPM)					TOTAL GAS	TOTAL METHANE
								TOTAL	BACKGROUND	C1	C2	C3	C4	C5		
10045 - 10070	F	D	H	3	1	6	ML/WCR	65	5	2000	800	600	200			

LITHOLOGICAL DESCRIPTION: 1. SST: silty, grey, f-coarse grained, silty clay matrix, poorly std, show may be residual oil?

DESCRIPTION OF FLUORESCENCE: ☐ No fluorescence

Percent sample with fluorescence	trace	10	20	30	40	50	60	70	80	>90
Fluorescence appearance	trace		spotted			streaked		patchy		solid
Brightness of fluorescence	v.dull		dull		dim			bright	v.bright	glowing
Colour of fluorescence	blue-white		white		green	yellow		gold (orange)		brown
Type of cut	trace	v.slow crush cut	crush cut	instant crush cut	v.slow streaming cut	slow stream	moderate streaming	streaming	fast streaming	instant
Colour of Cut	colourless		pale yellow	yellow	dark yellow	light orange	orange	dark brown		very dark brown opaque
Residue on spot plate	trace	heavy trace	v.thin ring	thin ring	thick ring	v.thick ring	thin film	thin film	thick film	solid

HYDROCARBON RECOVERY (FIT, DST RESULTS):

WELL NAME NARIMBA 1	FORMATION EVCM							DRILLING FLUIDS							CUTTINGS	
DEPTH INTERVAL	F/M	L/D	T	R	VP	HW	SOURCE	HOT WIRE		CHROMATOGRAPHIC ANALYSIS (PPM)					TOTAL GAS	TOTAL METHANE
								TOTAL	BACKGROUND	C1	C2	C3	C4	C5		
10840 - 10890	F	D	O	3	1	6	ML	35	15	1800	400	100				

LITHOLOGICAL DESCRIPTION: 1. SST: f-med grained, firm to hard, ang-rnd, mod well std, clay choked

DESCRIPTION OF FLUORESCENCE: ☐ No fluorescence

Percent sample with fluorescence	trace	10			20	30	40	50	60	70	80	>90
Fluorescence appearance	trace			spotted				streaked		patchy		solid
Brightness of fluorescence	v.dull			dull			dim			bright	v.bright	glowing
Colour of fluorescence	blue-white			white			green	yellow		gold (orange)		brown
Type of cut	trace	v.slow crush cut		weak crush cut		instant crush cut	v.slow streaming cut	slow stream	moderate streaming	streaming	fast streaming	instant
Colour of Cut	colourless			pale yellow		yellow	dark yellow	light orange	orange	dark brown		very dark brown opaque
Residue on spot plate	trace	heavy trace		v.thin ring		thin ring	thick ring	v.thick ring	thin film	thin film	thick film	solid

HYDROCARBON RECOVERY (FIT, DST RESULTS):

WELL NAME NARIMBA 1	FORMATION EVCM							DRILLING FLUIDS							CUTTINGS	
DEPTH INTERVAL	F/M	L/D	T	R	VP	HW	SOURCE	HOT WIRE		CHROMATOGRAPHIC ANALYSIS (PPM)					TOTAL GAS	TOTAL METHANE
								TOTAL	BACKGROUND	C1	C2	C3	C4	C5		
10960 - 10980	F	L	O	1	1	6	ML/WCR	60	10	1000	200				55	45

LITHOLOGICAL DESCRIPTION: 1. SST: f-med grained, firm to hard, ang-rnd, mod well std, clay choked

DESCRIPTION OF FLUORESCENCE: ☐ No fluorescence

Percent sample with fluorescence	trace	10	20	30	40	50	60	70	80	>90
Fluorescence appearance	trace		spotted			streaked		patchy		solid
Brightness of fluorescence	v.dull		dull		dim			bright	v.bright	glowing
Colour of fluorescence	blue-white		white		green	yellow		gold (orange)		brown
Type of cut	trace	v.slow crush cut	weak crush cut	instant crush cut	v.slow streaming cut	slow stream	moderate streaming	streaming	fast streaming	instant
Colour of Cut	colourless		pale yellow	yellow	dark yellow	light orange	orange	dark brown		very dark brown opaque
Residue on spot plate	trace	heavy trace	v.thin ring	thin ring	thick ring	v.thick ring	thin film	thin film	thick film	solid

HYDROCARBON RECOVERY (FIT, DST RESULTS):

WELL NAME **PELICAN 1**	FORMATION EVCM							DRILLING FLUIDS							CUTTINGS	
DEPTH INTERVAL	F/M	L/D	T	R	VP	HW	SOURCE	HOT WIRE		CHROMATOGRAPHIC ANALYSIS (PPM)					TOTAL GAS	TOTAL METHANE
								TOTAL	BACKGROUND	C1	C2	C3	C4	C5		
7760 - 7860	F	D	O	1	1	Q	ML	10	2	600	65				5	

LITHOLOGICAL DESCRIPTION: 1. SST, light-grey, vf grained, mod-hard, silty, with white clay matrix

DESCRIPTION OF FLUORESCENCE: ☐ No fluorescence

Percent sample with fluorescence	trace	10	20	30	40	50	60	70	80	>90
Fluorescence appearance	trace		spotted			streaked		patchy		solid
Brightness of fluorescence	v.dull		dull		dim			bright	v.bright	glowing
Colour of fluorescence	blue-white		white		green	yellow		gold (orange)		brown
Type of cut	trace	v.slow crush cut	crush cut	instant crush cut	v.slow streaming cut	slow stream	moderate streaming	streaming	fast streaming	instant
Colour of Cut	colourless		pale yellow	yellow	dark yellow	light orange	orange	dark brown		very dark brown opaque
Residue on spot plate	trace	heavy trace	v.thin ring	thin ring	thick ring	v.thick ring	thin film	thin film	thick film	solid

HYDROCARBON RECOVERY (FIT, DST RESULTS):

WELL NAME PELICAN 1	FORMATION EVCM							DRILLING FLUIDS							CUTTINGS	
DEPTH INTERVAL	F/M	L/D	T	R	VP	HW	SOURCE	HOT WIRE		CHROMATOGRAPHIC ANALYSIS (PPM)					TOTAL GAS	TOTAL METHANE
								TOTAL	BACKGROUND	C1	C2	C3	C4	C5		
8110 - 8130	F	D	H	7	5	Q	ML	240	5	22000	4500	600	150		60	

LITHOLOGICAL DESCRIPTION: 1. SST, light-grey, light brown, vf grained, sl calc with thin coal lenses

DESCRIPTION OF FLUORESCENCE: ☐ No fluorescence

Percent sample with fluorescence	trace	10	20	30	40	50	60	70	80	>90
Fluorescence appearance	trace		spotted			streaked		patchy		solid
Brightness of fluorescence	v.dull		dull		dim			bright	v.bright	glowing
Colour of fluorescence	blue-white		white		green	yellow		gold (orange)		brown
Type of cut	trace	v.slow crush cut	crush cut	instant crush cut	v.slow streaming cut	slow stream	moderate streaming	streaming	fast streaming	instant
Colour of Cut	colourless		pale yellow	yellow	dark yellow	light orange	orange	dark brown		very dark brown opaque
Residue on spot plate	trace	heavy trace	v.thin ring	thin ring	thick ring	v.thick ring	thin film	thin film	thick film	solid

HYDROCARBON RECOVERY (FIT, DST RESULTS): FIT 5 @ 8815 Rec 26.6 ft^3 gas, 1000 cc condensate + 100 cc mud filtrate

WELL NAME PELICAN 1	FORMATION EVCM							DRILLING FLUIDS							CUTTINGS	
DEPTH INTERVAL	F/M	L/D	T	R	VP	HW	SOURCE	HOT WIRE		CHROMATOGRAPHIC ANALYSIS (PPM)					TOTAL GAS	TOTAL METHANE
								TOTAL	BACKGROUND	C1	C2	C3	C4	C5		
8345 - 8390	F	D	H	7	5	Q	ML	68	6	8000	1500	90	20		55	

LITHOLOGICAL DESCRIPTION: 1. SST, white, fine-med grained, white clay matrix, sub-rnd, non-calc, even sorting, with a few thin horiz carb streaks, sugary texture

DESCRIPTION OF FLUORESCENCE: ☐ No fluorescence

Percent sample with fluorescence	trace	10	20	30	40	50	60	70	80	>90
Fluorescence appearance	trace		spotted			streaked		patchy		solid
Brightness of fluorescence	v.dull		dull		dim			bright	v.bright	glowing
Colour of fluorescence	blue-white		white		green	yellow		gold (orange)		brown
Type of cut	trace	v.slow crush cut	crush cut	instant crush cut	v.slow streaming cut	slow stream	moderate streaming	streaming	fast streaming	instant
Colour of Cut	colourless		pale yellow	yellow	dark yellow	light orange	orange	dark brown		very dark brown opaque
Residue on spot plate	trace	heavy trace	v.thin ring	thin ring	thick ring	v.thick ring	thin film	thin film	thick film	solid

HYDROCARBON RECOVERY (FIT, DST RESULTS) FIT 3 @ 8367 Rec 108.2 ft^3 gas + 3250 cc condensate + 6250 cc mud filtrate
FIT 21 @ 8367 (inside casing) Rec 139 ft^3 gas + 6000 cc condensate

WELL NAME PELICAN 1	FORMATION EVCM							DRILLING FLUIDS							CUTTINGS	
DEPTH INTERVAL	F/M	L/D	T	R	VP	HW	SOURCE	HOT WIRE		CHROMATOGRAPHIC ANALYSIS (PPM)					TOTAL GAS	TOTAL METHANE
								TOTAL	BACKGROUND	C1	C2	C3	C4	C5		
8445 - 8500	F	D	H	7	5	Q	ML	120	10	10000	1500	50			120	
									*Note: Gas Peak Associated with Coal Beds							

LITHOLOGICAL DESCRIPTION: 1. SST, white, f-med grained with surgary texture, well std, sub ang to rnd, non-calc

DESCRIPTION OF FLUORESCENCE: ☐ No fluorescence

Percent sample with fluorescence	trace	10	20	30	40	50	60	70	80	>90
Fluorescence appearance	trace		spotted			streaked		patchy (strong?)		solid
Brightness of fluorescence	v.dull		dull		dim			bright	v.bright	glowing
Colour of fluorescence	blue-white		white		green	yellow		gold (orange)		brown
Type of cut	trace	v.slow crush cut	crush cut	instant crush cut	v.slow streaming cut	slow stream	moderate streaming	streaming	fast streaming	instant
Colour of Cut	colourless		pale yellow	yellow	dark yellow	light orange	orange	dark brown		very dark brown opaque
Residue on spot plate	trace	heavy trace	v.thin ring	thin ring	thick ring	v.thick ring	thin film	thin film	thick film	solid

HYDROCARBON RECOVERY (FIT, DST RESULTS) FIT 2 @ 8484 Rec 118 ft^3 gas + 2500 cc condensate @ 7500 cc mud filtrate

WELL NAME PELICAN 1	FORMATION EVCM							DRILLING FLUIDS							CUTTINGS	
DEPTH INTERVAL	F/M	L/D	T	R	VP	HW	SOURCE	HOT WIRE		CHROMATOGRAPHIC ANALYSIS (PPM)					TOTAL GAS	TOTAL METHANE
								TOTAL	BACKGROUND	C1	C2	C3	C4	C5		
8545 - 8560	F	D	O	5	5	Q	ML	22	5	3000	200					

LITHOLOGICAL DESCRIPTION: 1. SST, light grey-white, f grained, well std, sub-ang to sub-rnd, with white clay matrix

DESCRIPTION OF FLUORESCENCE: ☐ No fluorescence

Percent sample with fluorescence	trace	10	20	30	40	50	60	70	80	>90
Fluorescence appearance	trace		spotted			streaked		patchy		solid
Brightness of fluorescence	v.dull		dull		dim			bright	v.bright	glowing
Colour of fluorescence	blue-white		white		green	yellow		gold (orange)		brown
Type of cut	trace	v.slow crush cut	crush cut	instant crush cut	v.slow streaming cut	slow stream	moderate streaming	streaming	fast streaming	instant
Colour of Cut	colourless		pale yellow	yellow	dark yellow	light orange	orange	dark brown		very dark brown opaque
Residue on spot plate	trace	heavy trace	v.thin ring	thin ring	thick ring	v.thick ring	thin film	thin film	thick film	solid

HYDROCARBON RECOVERY (FIT, DST RESULTS) FIT 1 @ 8557 Rec 100 cc (WCR) mud filtrate (ML) mechanical failure (CL)

WELL NAME PELICAN 1	FORMATION EVCM							DRILLING FLUIDS							CUTTINGS	
DEPTH INTERVAL	F/M	L/D	T	R	VP	HW	SOURCE	HOT WIRE		CHROMATOGRAPHIC ANALYSIS (PPM)					TOTAL GAS	TOTAL METHANE
								TOTAL	BACKGROUND	C1	C2	C3	C4	C5		
8620 - 8660	F	D	H	5	1	Q	ML/WCR	150	12	20000	3000	400	250			

LITHOLOGICAL DESCRIPTION: 1. Predom siltst with a trace of SST. SST: white, fine grained, sub-ang, abundant clay matrix

DESCRIPTION OF FLUORESCENCE: ☐ No fluorescence

Percent sample with fluorescence	trace	10	20	30	40	50	60	70	80	>90
Fluorescence appearance	trace		spotted			streaked		patchy		solid
Brightness of fluorescence	v.dull		dull		dim			bright	v.bright	glowing
Colour of fluorescence	blue-white		white		green	yellow		gold (orange)		brown
Type of cut	trace	v.slow crush cut	crush cut	instant crush cut	v.slow (slight) streaming cut	slow stream	moderate streaming	streaming	fast streaming	instant
Colour of Cut	colourless		pale yellow	yellow	dark yellow	light orange	orange	dark brown		very dark brown opaque
Residue on spot plate	trace	heavy trace	v.thin ring	thin ring	thick ring	v.thick ring	thin film	thin film	thick film	solid

HYDROCARBON RECOVERY (FIT, DST RESULTS) FIT 20 @ 8640 Rec 2200 cc mud filtrate

WELL NAME PELICAN 1	FORMATION EVCM							DRILLING FLUIDS							CUTTINGS	
DEPTH INTERVAL	F/M	L/D	T	R	VP	HW	SOURCE	HOT WIRE		CHROMATOGRAPHIC ANALYSIS (PPM)					TOTAL GAS	TOTAL METHANE
								TOTAL	BACKGROUND	C1	C2	C3	C4	C5		
8950 - 9035	F	D	H	7	3	Q	ML	330	10	20000	800	450	150		95	

LITHOLOGICAL DESCRIPTION: 1. SST, white, vf-f grained, hard, tight to fairly tight (= poor ?), white matrix

DESCRIPTION OF FLUORESCENCE: ☐ No fluorescence NOTE: fluor with faint cut described from SWC @ 9002, 9010

Percent sample with fluorescence	trace	10	20	30	40	50	60	70	80	>90
Fluorescence appearance	trace		spotted			streaked		patchy		solid
Brightness of fluorescence	v.dull		dull (pale)		dim			bright	v.bright	glowing
Colour of fluorescence	blue-white		white		green	yellow		gold (orange)		brown
Type of cut	trace	v.slow crush cut	crush cut	instant crush cut	v.slow (faint) streaming cut	slow stream	moderate streaming	streaming	fast streaming	instant
Colour of Cut	colourless		pale yellow	yellow	dark yellow	light orange	orange	dark brown		very dark brown opaque
Residue on spot plate	trace	heavy trace	v.thin ring	thin ring	thick ring	v.thick ring	thin film	thin film	thick film	solid

HYDROCARBON RECOVERY (FIT, DST RESULTS) FIT 19 @ 8985 Rec 69.8 ft^3 gas, 1000 cc condensate + 1750 cc mud filtrate
NOTE: The fluore scence throughout this section was reported from cuttings to be mineral fluorescence only

WELL NAME PELICAN 1	FORMATION EVCM							DRILLING FLUIDS							CUTTINGS	
DEPTH INTERVAL	F/M	L/D	T	R	VP	HW	SOURCE	HOT WIRE		CHROMATOGRAPHIC ANALYSIS (PPM)					TOTAL GAS	TOTAL METHANE
								TOTAL	BACKGROUND	C1	C2	C3	C4	C5		
9065 - 9205	F	D	G	5	3	Q	ML/WCR	300	20	20000	2000	600	200		60	

LITHOLOGICAL DESCRIPTION: 1. Several gas peaks ass with the sandstones of this interval.
SST, white, f.grained, mod std, sl mica, sl dolo, clay matrix.

DESCRIPTION OF FLUORESCENCE: ☐ No fluorescence NOTE: fluorescence from SWC @ 9180 & detailed cuttings description in WCR

Percent sample with fluorescence	trace	10	20	30	40	50	60	70	80	>90
Fluorescence appearance	trace		spotted			streaked		patchy		solid
Brightness of fluorescence	v.dull		dull		dim			bright	v.bright	glowing
Colour of fluorescence	blue-white		white		green	yellow		gold (orange)		brown
Type of cut	trace	v.slow crush cut	crush cut	instant crush cut	v.slow streaming cut	slow stream	moderate streaming	streaming	fast streaming	instant
Colour of Cut	colourless		pale yellow	yellow	dark yellow	light orange	orange	dark brown		very dark brown opaque
Residue on spot plate	trace	heavy trace	v.thin ring	thin ring	thick ring	v.thick ring	thin film	thin film	thick film	solid

HYDROCARBON RECOVERY (FIT, DST RESULTS) FIT's 17 & 18 @ 9167 & 9107 rec mud filtrate only

WELL NAME PELICAN 1	FORMATION EVCM							DRILLING FLUIDS							CUTTINGS	
DEPTH INTERVAL	F/M	L/D	T	R	VP	HW	SOURCE	HOT WIRE		CHROMATOGRAPHIC ANALYSIS (PPM)					TOTAL GAS	TOTAL METHANE
								TOTAL	BACKGROUND	C1	C2	C3	C4	C5		
9260 - 9300	F	D	H	3	1	Q	ML	80	12	9000	750	80			20	

LITHOLOGICAL DESCRIPTION: 1. Several minor gas peaks throughout this interval, some due to coals.
SST, appear as lenses within siltst & sh sequence. SST: silty to vf grained, v hwd

DESCRIPTION OF FLUORESCENCE: ☐ No fluorescence

Percent sample with fluorescence	trace	10	20	30	40	50	60	70	80	>90
Fluorescence appearance	trace		spotted			streaked		patchy		solid
Brightness of fluorescence	v.dull		dull		dim			bright	v.bright	glowing
Colour of fluorescence	blue-white		white		green	yellow		gold (orange)		brown
Type of cut	trace	v.slow crush cut	crush cut	instant crush cut	v.slow streaming cut	slow stream	moderate streaming	streaming	fast streaming	instant
Colour of Cut	colourless		pale yellow	yellow	dark yellow	light orange	orange	dark brown		very dark brown opaque
Residue on spot plate	trace	heavy trace	v.thin ring	thin ring	thick ring	v.thick ring	thin film	thin film	thick film	solid

HYDROCARBON RECOVERY (FIT, DST RESULTS) FIT's 14, 15 & 16 @ 9422, 9424, 9378 Rec mud filtrate & max 0.2 ft^3 gas

WELL NAME PELICAN 1	FORMATION EVCM							DRILLING FLUIDS							CUTTINGS	
DEPTH INTERVAL	F/M	L/D	T	R	VP	HW	SOURCE	HOT WIRE		CHROMATOGRAPHIC ANALYSIS (PPM)					TOTAL GAS	TOTAL METHANE
								TOTAL	BACKGROUND	C1	C2	C3	C4	C5		
9375 - 9505	F	D	H	5	3	Q	ML	280	15	25000	2000	150	30		55	
									* Gas Peaks from Coal Contaminated Sample							

LITHOLOGICAL DESCRIPTION: 1. SST, white, vf-f grained, sub-ang, quartzose, mod to poorly std, abundant clay matrix, hard, shale clasts common

DESCRIPTION OF FLUORESCENCE: ☐ No fluorescence

Percent sample with fluorescence	trace	10	20	30	40	50	60	70	80	>90
Fluorescence appearance	trace		spotted			streaked		patchy		solid
Brightness of fluorescence	v.dull		dull		dim			bright	v.bright	glowing
Colour of fluorescence	blue-white		white		green	yellow		gold (orange)		brown
Type of cut	trace	v.slow crush cut	crush cut	instant crush cut	v.slow streaming cut	slow stream	moderate streaming	streaming	fast streaming	instant
Colour of Cut	colourless		pale yellow	yellow	dark yellow	light orange	orange	dark brown		very dark brown opaque
Residue on spot plate	trace	heavy trace	v.thin ring	thin ring	thick ring	v.thick ring	thin film	thin film	thick film	solid

HYDROCARBON RECOVERY (FIT, DST RESULTS)

WELL NAME PELICAN 1	FORMATION EVCM							DRILLING FLUIDS							CUTTINGS	
DEPTH INTERVAL	F/M	L/D	T	R	VP	HW	SOURCE	HOT WIRE		CHROMATOGRAPHIC ANALYSIS (PPM)					TOTAL GAS	TOTAL METHANE
								TOTAL	BACKGROUND	C1	C2	C3	C4	C5		
9830 - 9880	F	D	O	3	5	Q	ML		Gas Peaks Ass with Coals							

LITHOLOGICAL DESCRIPTION: 1. SST, med-coarse grained, well std, sub-ang, loose

DESCRIPTION OF FLUORESCENCE: ☐ No fluorescence

Percent sample with fluorescence	trace	10	20	30	40	50	60	70	80	>90
Fluorescence appearance	trace		spotted			streaked		patchy		solid
Brightness of fluorescence	v.dull		dull		dim			bright	v.bright	glowing
Colour of fluorescence	blue-white		white		green	yellow		gold (orange)		brown
Type of cut	trace	v.slow crush cut	crush cut	instant crush cut	v.slow streaming cut	slow stream	moderate streaming	streaming	fast streaming	instant
Colour of Cut	colourless		pale yellow	yellow	dark yellow	light orange	orange	dark brown		very dark brown opaque
Residue on spot plate	trace	heavy trace	v.thin ring	thin ring	thick ring	v.thick ring	thin film	thin film	thick film	solid

HYDROCARBON RECOVERY (FIT, DST RESULTS): FIT 11 @ 9858 Rec 3000 cc mud filtrate

WELL NAME PELICAN 1	FORMATION EVCM							DRILLING FLUIDS							CUTTINGS	
DEPTH INTERVAL	F/M	L/D	T	R	VP	HW	SOURCE	HOT WIRE		CHROMATOGRAPHIC ANALYSIS (PPM)					TOTAL GAS	TOTAL METHANE
								TOTAL	BACKGROUND	C1	C2	C3	C4	C5		
9910 - 9955	F	D	G	3	5	Q	ML/HW	110	30	8000	850	80	20		10	

LITHOLOGICAL DESCRIPTION: 1. Several minor gas peaks throughout interval
SST, loose grains, f-coarse grained, sub-ang, mod std, trace white & brown clay on grain faces

DESCRIPTION OF FLUORESCENCE: ☒ No fluorescence

Percent sample with fluorescence	trace	10	20	30	40	50	60	70	80	>90
Fluorescence appearance	trace		spotted			streaked		patchy		solid
Brightness of fluorescence	v.dull		dull		dim			bright	v.bright	glowing
Colour of fluorescence	blue-white		white		green	yellow		gold (orange)		brown
Type of cut	trace	v.slow crush cut	crush cut	instant crush cut	v.slow streaming cut	slow stream	moderate streaming	streaming	fast streaming	instant
Colour of Cut	colourless		pale yellow	yellow	dark yellow	light orange	orange	dark brown		very dark brown opaque
Residue on spot plate	trace	heavy trace	v.thin ring	thin ring	thick ring	v.thick ring	thin film	thin film	thick film	solid

HYDROCARBON RECOVERY (FIT, DST RESULTS):

WELL NAME PELICAN 1	FORMATION EVCM							DRILLING FLUIDS							CUTTINGS	
DEPTH INTERVAL	F/M	L/D	T	R	VP	HW	SOURCE	HOT WIRE		CHROMATOGRAPHIC ANALYSIS (PPM)					TOTAL GAS	TOTAL METHANE
								TOTAL	BACKGROUND	C1	C2	C3	C4	C5		
10030 - 10060	F	D	H	5	3	Q	ML/WCR	70	30	5000	500	50	20		15	

LITHOLOGICAL DESCRIPTION: 1. SST, white, hard, silty-coarse grained, poorly std, white clay matrix

DESCRIPTION OF FLUORESCENCE: ☐ No fluorescence NOTE: fluor from SWC @ 10040

Percent sample with fluorescence	trace	10	20	30	40	50	60	70	80	>90
Fluorescence appearance	trace		spotted			streaked		patchy		solid
Brightness of fluorescence	v.dull		dull		dim			bright	v.bright	glowing
Colour of fluorescence	blue-white		white		green	yellow		gold (orange)		brown
Type of cut	trace	v.slow crush cut	crush cut	instant crush cut	v.slow streaming cut	slow stream	moderate streaming	streaming good?	fast streaming	instant
Colour of Cut	colourless		pale yellow	yellow	dark yellow	light orange	orange	dark brown		very dark brown opaque
Residue on spot plate	trace	heavy trace	v.thin ring	thin ring	thick ring	v.thick ring	thin film	thin film	thick film	solid

HYDROCARBON RECOVERY (FIT, DST RESULTS): FIT 13 @ 10041 Rec 3.2 ft^3 gas + 21000 cc mud filtrate with trace condensate

WELL NAME PELICAN 1	FORMATION EVCM							DRILLING FLUIDS							CUTTINGS	
DEPTH INTERVAL	F/M	L/D	T	R	VP	HW	SOURCE	HOT WIRE		CHROMATOGRAPHIC ANALYSIS (PPM)					TOTAL GAS	TOTAL METHANE
								TOTAL	BACKGROUND	C1	C2	C3	C4	C5		
10360 - 10385	F	D	G	7	5	Q	ML	2000	60	90000	15000	3000	2500		250	
									* Gas Peak may be Trip Gas/or Coal Gas							

LITHOLOGICAL DESCRIPTION: 1. SST, white-light brown, f-med grained, silty in part, mod std, abundant clay matrix

DESCRIPTION OF FLUORESCENCE: ☒ No fluorescence

Percent sample with fluorescence	trace	10	20	30	40	50	60	70	80	>90
Fluorescence appearance	trace		spotted			streaked		patchy		solid
Brightness of fluorescence	v.dull		dull		dim			bright	v.bright	glowing
Colour of fluorescence	blue-white		white		green	yellow		gold (orange)		brown
Type of cut	trace	v.slow crush cut	crush cut	instant crush cut	v.slow streaming cut	slow stream	moderate streaming	streaming	fast streaming	instant
Colour of Cut	colourless		pale yellow	yellow	dark yellow	light orange	orange	dark brown		very dark brown opaque
Residue on spot plate	trace	heavy trace	v.thin ring	thin ring	thick ring	v.thick ring	thin film	thin film	thick film	solid

HYDROCARBON RECOVERY (FIT, DST RESULTS): FIT 8 @ 10372 Rec 7.8 ft^3 gas + 100 cc condensate

491445

WELL NAME PELICAN 2	FORMATION TORQUAY							DRILLING FLUIDS							CUTTINGS	
DEPTH INTERVAL	F/M	L/D	T	R	VP	HW	SOURCE	HOT WIRE		CHROMATOGRAPHIC ANALYSIS (PPM)					TOTAL GAS	TOTAL METHANE
								TOTAL	BACKGROUND	C1	C2	C3	C4	C5		
3200 - 3530	F	D	H	1		Q	ML/WCR	2	2	180						
(CORR: 3420 - 3630)																

LITHOLOGICAL DESCRIPTION: 1. Marl, light grey, soluble, with abundant fossil fragments, calcareous, traces calcarenite traces pyrite

DESCRIPTION OF FLUORESCENCE: ☐ No fluorescence NOTE: fluorescence ass with some fossil fragments

Percent sample with fluorescence	trace	10	20	30	40	50	60	70	80	>90
Fluorescence appearance	trace		spotted			streaked		patchy		solid
Brightness of fluorescence	v.dull		dull		dim			bright	v.bright	glowing
Colour of fluorescence	blue-white		white		green	yellow		gold (orange)		brown
Type of cut	trace - none	v.slow crush cut	crush cut	instant crush cut	v.slow streaming cut	slow stream	moderate streaming	streaming	fast streaming	instant
Colour of Cut	colourless		pale yellow	yellow	dark yellow	light orange	orange	dark brown		very dark brown opaque
Residue on spot plate	trace	heavy trace	v.thin ring	thin ring	thick ring	v.thick ring	thin film	thin film	thick film	solid

HYDROCARBON RECOVERY (FIT, DST RESULTS):

WELL NAME PELICAN 2	FORMATION EVCM							DRILLING FLUIDS							CUTTINGS	
DEPTH INTERVAL	F/M	L/D	T	R	VP	HW	SOURCE	HOT WIRE		CHROMATOGRAPHIC ANALYSIS (PPM)					TOTAL GAS	TOTAL METHANE
								TOTAL	BACKGROUND	C1	C2	C3	C4	C5		
9096 - 9116	F	L	O	1	1	Q	CL	12	12	300	40					

LITHOLOGICAL DESCRIPTION: 1. SST, buff, vf-f grained, sub-ang to sub-rnd, clay choked, laminated with dark brown carbonaceous shale

DESCRIPTION OF FLUORESCENCE: ☐ No fluorescence NOTE: fluor from SWC @ 9112

Percent sample with fluorescence	trace	10	20	30	40	50	60	70	80	>90
Fluorescence appearance	trace		spotted			streaked		patchy		solid
Brightness of fluorescence	v.dull		dull		dim			bright	v.bright	glowing
Colour of fluorescence	blue-white		white		green	yellow		gold (orange)		brown
Type of cut	trace	v.slow crush cut	crush cut	instant crush cut	v.slow streaming cut	slow stream	moderate streaming	streaming	fast streaming	instant
Colour of Cut	colourless		pale yellow	yellow	dark yellow	light orange	orange	dark brown		very dark brown opaque
Residue on spot plate	trace	heavy trace	v.thin ring	thin ring	thick ring	v.thick ring	thin film	thin film	thick film	solid

HYDROCARBON RECOVERY (FIT, DST RESULTS):

WELL NAME PELICAN 2	FORMATION EVCM							DRILLING FLUIDS							CUTTINGS	
DEPTH INTERVAL	F/M	L/D	T	R	VP	HW	SOURCE	HOT WIRE		CHROMATOGRAPHIC ANALYSIS (PPM)					TOTAL GAS	TOTAL METHANE
								TOTAL	BACKGROUND	C1	C2	C3	C4	C5		
9144 - 9156	F	L	O	1	2	Q	CL	25	25	600	40					

LITHOLOGICAL DESCRIPTION: 1. SST, buff, f.gr, sub-ang to sub-rnd, clay choked

DESCRIPTION OF FLUORESCENCE: ☐ No fluorescence

Percent sample with fluorescence	trace	10	20	30	40	50	60	70	80	>90
Fluorescence appearance	trace		spotted			streaked		patchy		solid
Brightness of fluorescence	v.dull		dull		dim			bright	v.bright	glowing
Colour of fluorescence	blue-white		white		green	yellow		gold (orange)		brown
Type of cut	trace	v.slow crush cut	crush cut	instant crush cut	v.slow streaming cut	slow stream	moderate streaming	streaming	fast streaming	instant
Colour of Cut	colourless		pale yellow	yellow	dark yellow	light orange	orange	dark brown		very dark brown opaque
Residue on spot plate	trace	heavy trace	v.thin ring	thin ring	thick ring	v.thick ring	thin film	thin film	thick film	solid

HYDROCARBON RECOVERY (FIT, DST RESULTS): FIT 3 @ 9149' Rec 1600 cc filtrate

WELL NAME PELICAN 2	FORMATION EVCM							DRILLING FLUIDS							CUTTINGS	
DEPTH INTERVAL	F/M	L/D	T	R	VP	HW	SOURCE	HOT WIRE		CHROMATOGRAPHIC ANALYSIS (PPM)					TOTAL GAS	TOTAL METHANE
								TOTAL	BACKGROUND	C1	C2	C3	C4	C5		
9175 - 9218	F	D	O	1	2	Q	ML	150	25	8500	500	50				
									* Gas Peaks Ass with Coal Contamination (wireline logs indicate no coals present							

LITHOLOGICAL DESCRIPTION: 1. SST, vf grained, light grey, well std, friable

DESCRIPTION OF FLUORESCENCE: ☐ No fluorescence

Percent sample with fluorescence	trace	10	20 minor?	30	40	50	60	70	80	>90
Fluorescence appearance	trace		spotted			streaked		patchy		solid
Brightness of fluorescence	v.dull		dull		dim			bright	v.bright	glowing
Colour of fluorescence	blue-white		white		green	yellow		gold (orange)		brown
Type of cut	trace	v.slow crush cut	crush cut	instant crush cut	v.slow streaming cut	slow stream	moderate streaming	streaming	fast streaming	instant
Colour of Cut	colourless		pale yellow	yellow	dark yellow	light orange	orange	dark brown		very dark brown opaque
Residue on spot plate	trace	heavy trace	v.thin ring	thin ring	thick ring	v.thick ring	thin film	thin film	thick film	solid

HYDROCARBON RECOVERY (FIT, DST RESULTS):

WELL NAME PELICAN 2	FORMATION EVCM							DRILLING FLUIDS							CUTTINGS	
DEPTH INTERVAL	F/M	L/D	T	R	VP	HW	SOURCE	HOT WIRE		CHROMATOGRAPHIC ANALYSIS (PPM)					TOTAL GAS	TOTAL METHANE
								TOTAL	BACKGROUND	C1	C2	C3	C4	C5		
9300 - 9350	F	D	O	3	1	Q	ML	25	10	700	90					

LITHOLOGICAL DESCRIPTION: 1. SST, white, vf-f gr, firm, sub-rnd, sl calc, clay matrix

DESCRIPTION OF FLUORESCENCE: ☐ No fluorescence

Percent sample with fluorescence	trace	10	20	30	40	50	60	70	80	>90
Fluorescence appearance	trace		spotted			streaked		patchy		solid
Brightness of fluorescence	v.dull		dull		dim			bright	v.bright	glowing
Colour of fluorescence	blue-white		white		green	yellow		gold (orange)		brown
Type of cut	trace	v.slow crush cut	crush cut	instant crush cut	v.slow streaming cut	slow stream	moderate streaming	streaming - good?	fast streaming	instant
Colour of Cut	colourless		pale yellow	yellow	dark yellow	light orange	orange	dark brown		very dark brown opaque
Residue on spot plate	trace	heavy trace	v.thin ring	thin ring	thick ring	v.thick ring	thin film	thin film	thick film	solid

HYDROCARBON RECOVERY (FIT, DST RESULTS): FIT 2 @ 9312 Rec 100 cc mud

WELL NAME PELICAN 2	FORMATION EVCM							DRILLING FLUIDS							CUTTINGS	
DEPTH INTERVAL	F/M	L/D	T	R	VP	HW	SOURCE	HOT WIRE		CHROMATOGRAPHIC ANALYSIS (PPM)					TOTAL GAS	TOTAL METHANE
								TOTAL	BACKGROUND	C1	C2	C3	C4	C5		
9400 - 9485	F	D	H	7	4	Q	ML	250	15	20000	2000	250	80		50	

LITHOLOGICAL DESCRIPTION: 1. SST, vf gr, light grey-grey brown, well sorted, silty, friable

DESCRIPTION OF FLUORESCENCE: ☐ No fluorescence

Percent sample with fluorescence	trace	10	20	30	40	50	60	70	80	>90
Fluorescence appearance	trace		spotted			streaked		patchy		solid
Brightness of fluorescence	v.dull		dull		dim			bright	v.bright	glowing
Colour of fluorescence	blue-white		white		green	yellow		gold (orange)		brown
Type of cut	trace	v.slow crush cut	crush cut	instant crush cut	v.slow streaming cut	slow stream	moderate streaming	streaming	fast streaming	instant
Colour of Cut	colourless		pale yellow	yellow	dark yellow	light orange	orange	dark brown		very dark brown opaque
Residue on spot plate	trace	heavy trace	v.thin ring	thin ring	thick ring	v.thick ring	thin film	thin film	thick film	solid

HYDROCARBON RECOVERY (FIT, DST RESULTS): FIT 1 @ 9447 Rec 37 ft^3 gas, 950 cc condensate (56°API) 13000 cc filtrate

WELL NAME PELICAN 2	FORMATION EVCM							DRILLING FLUIDS							CUTTINGS	
DEPTH INTERVAL	F/M	L/D	T	R	VP	HW	SOURCE	HOT WIRE		CHROMATOGRAPHIC ANALYSIS (PPM)					TOTAL GAS	TOTAL METHANE
								TOTAL	BACKGROUND	C1	C2	C3	C4	C5		
9655 - 9750	F	D	G	3	3	Q	ML	40	5	2500	300					

LITHOLOGICAL DESCRIPTION: 1. SST, white-clear, quartzose, med-coarse, well std, white clay matrix

DESCRIPTION OF FLUORESCENCE: ☐ No fluorescence

Percent sample with fluorescence	trace	10	20	30	40	50 fair?	60	70	80	>90
Fluorescence appearance	trace		spotted			streaked		patchy		solid
Brightness of fluorescence	v.dull		dull		dim			bright	v.bright	glowing
Colour of fluorescence	blue-white		white		green	yellow		gold (orange)		brown
Type of cut	trace	v.slow crush cut	crush cut	instant crush cut	v.slow streaming cut	slow stream	moderate streaming	streaming	fast streaming	instant
Colour of Cut	colourless		pale yellow	yellow	dark yellow	light orange	orange	dark brown		very dark brown opaque
Residue on spot plate	trace	heavy trace	v.thin ring	thin ring	thick ring	v.thick ring	thin film	thin film	thick film	solid

HYDROCARBON RECOVERY (FIT, DST RESULTS): FIT 7 @ 9706 Rec 3.7 ft^3 gas, 16,300 cc filtrate

WELL NAME PELICAN 2	FORMATION EVCM							DRILLING FLUIDS							CUTTINGS	
DEPTH INTERVAL	F/M	L/D	T	R	VP	HW	SOURCE	HOT WIRE		CHROMATOGRAPHIC ANALYSIS (PPM)					TOTAL GAS	TOTAL METHANE
								TOTAL	BACKGROUND	C1	C2	C3	C4	C5		
9780 - 9815	F	D	O	3	3	Q	ML		Returns not Circulated (Cored Interval)							

LITHOLOGICAL DESCRIPTION: 1. SST, vf-med grain, well std, sub-ang, sl friable

DESCRIPTION OF FLUORESCENCE: ☐ No fluorescence

Percent sample with fluorescence	trace	10	20	30	40	50	60	70	80	>90
Fluorescence appearance	trace		spotted			streaked		patchy		solid
Brightness of fluorescence	v.dull		dull		dim			bright	v.bright	glowing
Colour of fluorescence	blue-white		white		green	yellow		gold (orange)		brown
Type of cut	trace	v.slow crush cut	crush cut	instant crush cut	v.slow streaming cut	slow stream	moderate streaming	streaming	fast streaming	instant
Colour of Cut	colourless		pale yellow	yellow	dark yellow	light orange	orange	dark brown		very dark brown opaque
Residue on spot plate	trace	heavy trace	v.thin ring	thin ring	thick ring	v.thick ring	thin film	thin film	thick film	solid

HYDROCARBON RECOVERY (FIT, DST RESULTS): FIT 5 @ 9784 Rec 50 cc mud
FIT 9 @ 9785 Rec 0.6 ft^3 gas + 1100 cc filtrate

WELL NAME PELICAN 2	FORMATION EVCM							DRILLING FLUIDS							CUTTINGS	
DEPTH INTERVAL	F/M	L/D	T	R	VP	HW	SOURCE	HOT WIRE		CHROMATOGRAPHIC ANALYSIS (PPM)					TOTAL GAS	TOTAL METHANE
								TOTAL	BACKGROUND	C1	C2	C3	C4	C5		
9890 - 9980	F	D	O	3	5	Q	ML		Gas Peaks Ass with Coals							

LITHOLOGICAL DESCRIPTION: 1. SST, quartzose, white, f-med grain, white matrix, well std

DESCRIPTION OF FLUORESCENCE: ☐ No fluorescence

Percent sample with fluorescence	trace	10	20	30	40	50	60	70 good?	80	>90
Fluorescence appearance	trace		spotted			streaked		patchy		solid
Brightness of fluorescence	v.dull		dull		dim			bright	v.bright	glowing
Colour of fluorescence	blue-white		white		green	yellow		gold (orange)		brown
Type of cut	trace	v.slow crush cut	crush cut	instant crush cut	v.slow streaming cut	slow stream	moderate streaming	streaming	fast streaming	instant
Colour of Cut	colourless		pale yellow	yellow	dark yellow	light orange	orange	dark brown		very dark brown opaque
Residue on spot plate	trace	heavy trace	v.thin ring	thin ring	thick ring	v.thick ring	thin film	thin film	thick film	solid

HYDROCARBON RECOVERY (FIT, DST RESULTS): FIT 6 @ 9906 Rec 0.4 ft^3 gas & 1100 cc filtrate
FIT 10 @ 9904 Rec 0.6 ft^3 gas & 1100 cc filtrate

491454

WELL NAME PELICAN 2	FORMATION EVCM							DRILLING FLUIDS							CUTTINGS	
DEPTH INTERVAL	F/M	L/D	T	R	VP	HW	SOURCE	HOT WIRE		CHROMATOGRAPHIC ANALYSIS (PPM)					TOTAL GAS	TOTAL METHANE
								TOTAL	BACKGROUND	C1	C2	C3	C4	C5	13	
10050 - 10066	F	D	O	1	3	Q	ML	1	10	800	60					

LITHOLOGICAL DESCRIPTION: 1. SST, light grey, quartzose, fine gr, trace lithics, carb debris, trace white, clay matrix

DESCRIPTION OF FLUORESCENCE: ☐ No fluorescence

Percent sample with fluorescence	trace	10	20	30	40	50	60	70	80	>90
Fluorescence appearance	trace		spotted			streaked		patchy		solid
Brightness of fluorescence	v.dull		dull		dim			bright	v.bright	glowing
Colour of fluorescence	blue-white		white		green	yellow		gold (orange)		brown
Type of cut	trace	v.slow crush cut	crush cut	instant crush cut	v.slow streaming cut	slow stream	moderate streaming	streaming	fast streaming	instant
Colour of Cut	colourless		pale yellow	yellow	dark yellow	light orange	orange	dark brown		very dark brown opaque
Residue on spot plate	trace	heavy trace	v.thin ring	thin ring	thick ring	v.thick ring	thin film	thin film	thick film	solid

HYDROCARBON RECOVERY (FIT, DST RESULTS):

WELL NAME PELICAN 3	FORMATION TORQUAY							DRILLING FLUIDS							CUTTINGS	
DEPTH INTERVAL	F/M	L/D	T	R	VP	HW	SOURCE	HOT WIRE		CHROMATOGRAPHIC ANALYSIS (PPM)					TOTAL GAS	TOTAL METHANE
								TOTAL	BACKGROUND	C1	C2	C3	C4	C5		
4975 - 5130	F	D	G	1		6	HW	5	5	2000					27	25

LITHOLOGICAL DESCRIPTION: 1. Siltst, med-dark brown, sl calc, vf grained, loosely consol to firm

DESCRIPTION OF FLUORESCENCE: ☒ No fluorescence

Percent sample with fluorescence	trace	10	20	30	40	50	60	70	80	>90
Fluorescence appearance	trace		spotted			streaked		patchy		solid
Brightness of fluorescence	v.dull		dull		dim			bright	v.bright	glowing
Colour of fluorescence	blue-white		white		green	yellow		gold (orange)		brown
Type of cut	trace	v.slow crush cut	crush cut	instant crush cut	v.slow streaming cut	slow stream	moderate streaming	streaming	fast streaming	instant
Colour of Cut	colourless		pale yellow	yellow	dark yellow	light orange	orange	dark brown		very dark brown opaque
Residue on spot plate	trace	heavy trace	v.thin ring	thin ring	thick ring	v.thick ring	thin film	thin film	thick film	solid

HYDROCARBON RECOVERY (FIT, DST RESULTS):

WELL NAME PELICAN 3	FORMATION EVCM							DRILLING FLUIDS							CUTTINGS	
DEPTH INTERVAL	F/M	L/D	T	R	VP	HW	SOURCE	HOT WIRE		CHROMATOGRAPHIC ANALYSIS (PPM)					TOTAL GAS	TOTAL METHANE
								TOTAL	BACKGROUND	C1	C2	C3	C4	C5		
6410 - 6820	F	D	G	1		6	ML/HW	7	3	2000						

LITHOLOGICAL DESCRIPTION: 1. Several minor gas peaks throughout this interval. Intbd sand & siltst sequence, with minor coal SST, white, v.fine-fine grained, ang-subang, consol

DESCRIPTION OF FLUORESCENCE: ☐ No fluorescence

Percent sample with fluorescence	trace	10	20	30	40	50	60	70	80	>90
Fluorescence appearance	trace		spotted			streaked		patchy		solid
Brightness of fluorescence	v.dull		dull		dim			bright	v.bright	glowing
Colour of fluorescence	blue-white		white		green	yellow		gold (orange)		brown
Type of cut	trace	v.slow crush cut	crush cut	instant crush cut	v.slow streaming cut	slow stream	moderate streaming	streaming	fast streaming	instant
Colour of Cut	colourless		pale yellow	yellow	dark yellow	light orange	orange	dark brown		very dark brown opaque
Residue on spot plate	trace	heavy trace	v.thin ring	thin ring	thick ring	v.thick ring	thin film	thin film	thick film	solid

HYDROCARBON RECOVERY (FIT, DST RESULTS):

WELL NAME PELICAN 3	FORMATION EVCM							DRILLING FLUIDS							CUTTINGS	
DEPTH INTERVAL	F/M	L/D	T	R	VP	HW	SOURCE	HOT WIRE		CHROMATOGRAPHIC ANALYSIS (PPM)					TOTAL GAS	TOTAL METHANE
								TOTAL	BACKGROUND	C1	C2	C3	C4	C5		
7500 - 7600	F	D	O	1		6	ML	30	3	10000	350					

LITHOLOGICAL DESCRIPTION: 1. SST/Siltst/Coal intbds SST: clear, f-med grained, calc matrix
Gas peaks associated with coals. fluorescence associated with the sandstone

DESCRIPTION OF FLUORESCENCE: ☐ No fluorescence

Percent sample with fluorescence	trace	10	20	30	40	50	60	70	80	>90
Fluorescence appearance	trace		spotted			streaked		patchy		solid
Brightness of fluorescence	v.dull		dull		dim			bright	v.bright	glowing
Colour of fluorescence	blue-white		white		green	yellow		gold (orange)		brown
Type of cut	trace	v.slow crush cut	crush cut	instant crush cut	v.slow streaming cut	slow stream	moderate streaming	streaming	fast streaming	instant
Colour of Cut	colourless		pale yellow	yellow	dark yellow	light orange	orange	dark brown		very dark brown opaque
Residue on spot plate	trace	heavy trace	v.thin ring	thin ring	thick ring	v.thick ring	thin film	thin film	thick film	solid

HYDROCARBON RECOVERY (FIT, DST RESULTS):

WELL NAME PELICAN 3	FORMATION EVCM							DRILLING FLUIDS							CUTTINGS	
DEPTH INTERVAL	F/M	L/D	T	R	VP	HW	SOURCE	HOT WIRE		CHROMATOGRAPHIC ANALYSIS (PPM)					TOTAL GAS	TOTAL METHANE
								TOTAL	BACKGROUND	C1	C2	C3	C4	C5		
8200 - 8300	F	D	O	1		6	ML	15	3	5000					45	43
8450 - 8550	F	D	O	1		6	ML	5	2	1500						

LITHOLOGICAL DESCRIPTION: 1. SST, clear white-light brown, f-grained, sub-rnd, consol-unconsol

DESCRIPTION OF FLUORESCENCE: ☐ No fluorescence

Percent sample with fluorescence	trace	10	20	30	40	50	60	70	80	>90
Fluorescence appearance	trace		spotted			streaked		patchy		solid
Brightness of fluorescence	v.dull - weak?		dull		dim			bright	v.bright	glowing
Colour of fluorescence	blue-white		white		green	yellow		gold (orange)		brown
Type of cut	trace - none	v.slow crush cut	crush cut	instant crush cut	v.slow streaming cut	slow stream	moderate streaming	streaming	fast streaming	instant
Colour of Cut	colourless		pale yellow	yellow	dark yellow	light orange	orange	dark brown		very dark brown opaque
Residue on spot plate	trace	heavy trace	v.thin ring	thin ring	thick ring	v.thick ring	thin film	thin film	thick film	solid

HYDROCARBON RECOVERY (FIT, DST RESULTS):

WELL NAME PELICAN 3	FORMATION EVCM							DRILLING FLUIDS							CUTTINGS	
DEPTH INTERVAL	F/M	L/D	T	R	VP	HW	SOURCE	HOT WIRE		CHROMATOGRAPHIC ANALYSIS (PPM)					TOTAL GAS	TOTAL METHANE
								TOTAL	BACKGROUND	C1	C2	C3	C4	C5		
9120 - 9270	F	D	H	1		6	ML	10	5	7000	600	400			10	8

LITHOLOGICAL DESCRIPTION: 1. Intbd sand, silt & coal. Gas peaks & fluor ass with sand
SST, clear/white, quartzitic, vf grained, sub-rnd to rnd, clean, well std, mod consol with white sl calc matrix

DESCRIPTION OF FLUORESCENCE: ☐ No fluorescence

Percent sample with fluorescence	trace	10	20	30	40	50	60	70	80	>90
Fluorescence appearance	trace		spotted			streaked		patchy		solid
Brightness of fluorescence	v.dull		dull		dim			bright	v.bright	glowing
Colour of fluorescence	blue-white		white		green	yellow		gold (orange)		brown
Type of cut	trace	v.slow crush cut	crush cut	instant crush cut	v.slow streaming cut	slow stream	moderate streaming	streaming	fast streaming	instant
Colour of Cut	colourless		pale yellow	yellow	dark yellow	light orange	orange	dark brown		very dark brown opaque
Residue on spot plate	trace	heavy trace	v.thin ring	thin ring	thick ring	v.thick ring	thin film	thin film	thick film	solid

HYDROCARBON RECOVERY (FIT, DST RESULTS): DST 1 @ 9351-9521, Rec formation water gas at RTSTM

WELL NAME PELICAN 3	FORMATION EVCM							DRILLING FLUIDS							CUTTINGS	
DEPTH INTERVAL	F/M	L/D	T	R	VP	HW	SOURCE	HOT WIRE		CHROMATOGRAPHIC ANALYSIS (PPM)					TOTAL GAS	TOTAL METHANE
								TOTAL	BACKGROUND	C1	C2	C3	C4	C5		
9350 - 9520	F	D	O	3	4	6	ML	Chromatograph Not Operating) (This Interval Represents Three Continuous Cores)								

LITHOLOGICAL DESCRIPTION: 1. SST, light grey, vf-f grained, silty, sub-ang

DESCRIPTION OF FLUORESCENCE: ☐ No fluorescence

Percent sample with fluorescence	trace	10	20	30	40	50	60	70	80	>90
Fluorescence appearance	trace		spotted			streaked		patchy		solid
Brightness of fluorescence	v.dull		dull		dim			bright	v.bright	glowing
Colour of fluorescence	blue-white		white		green	yellow		gold (orange)		brown
Type of cut	trace	v.slow crush cut	crush cut	instant crush cut	v.slow streaming cut	slow stream	moderate streaming	streaming	fast streaming	instant
Colour of Cut	colourless		pale yellow	yellow	dark yellow	light orange	orange	dark brown		very dark brown opaque
Residue on spot plate	trace	heavy trace	v.thin ring	thin ring	thick ring	v.thick ring	thin film	thin film	thick film	solid

HYDROCARBON RECOVERY (FIT, DST RESULTS):

WELL NAME PELICAN 4	FORMATION EVCM							DRILLING FLUIDS							CUTTINGS	
DEPTH INTERVAL	F/M	L/D	T	R	VP	HW	SOURCE	HOT WIRE		CHROMATOGRAPHIC ANALYSIS (PPM)					TOTAL GAS	TOTAL METHANE
								TOTAL	BACKGROUND	C1	C2	C3	C4	C5		
7900 - 8005	F	L	G	1	3	4	CL/HW	1	1	220						

LITHOLOGICAL DESCRIPTION: 1. SST, white, hard, vf-coarse grain, mod std, sub-ang, quartzose, siliceous, calc/dolo cement

DESCRIPTION OF FLUORESCENCE: ☒ No fluorescence

Percent sample with fluorescence	trace	10	20	30	40	50	60	70	80	>90
Fluorescence appearance	trace		spotted			streaked		patchy		solid
Brightness of fluorescence	v.dull		dull		dim			bright	v.bright	glowing
Colour of fluorescence	blue-white		white		green	yellow		gold (orange)		brown
Type of cut	trace	v.slow crush cut	crush cut	instant crush cut	v.slow streaming cut	slow stream	moderate streaming	streaming	fast streaming	instant
Colour of Cut	colourless		pale yellow	yellow	dark yellow	light orange	orange	dark brown		very dark brown opaque
Residue on spot plate	trace	heavy trace	v.thin ring	thin ring	thick ring	v.thick ring	thin film	thin film	thick film	solid

HYDROCARBON RECOVERY (FIT, DST RESULTS):

WELL NAME PELICAN 4	FORMATION EVCM							DRILLING FLUIDS							CUTTINGS	
DEPTH INTERVAL	F/M	L/D	T	R	VP	HW	SOURCE	HOT WIRE		CHROMATOGRAPHIC ANALYSIS (PPM)					TOTAL GAS	TOTAL METHANE
								TOTAL	BACKGROUND	C1	C2	C3	C4	C5		
8950 - 9000	F	D	H	7		4	ML	150	2	40000	3500	2500	320			

LITHOLOGICAL DESCRIPTION: 1. SST, f-med, grain, clear, white, loose, mod cmtd

DESCRIPTION OF FLUORESCENCE: ☒ No fluorescence

Percent sample with fluorescence	trace	10	20	30	40	50	60	70	80	>90
Fluorescence appearance	trace		spotted			streaked		patchy		solid
Brightness of fluorescence	v.dull		dull		dim			bright	v.bright	glowing
Colour of fluorescence	blue-white		white		green	yellow		gold (orange)		brown
Type of cut	trace	v.slow crush cut	crush cut	instant crush cut	v.slow streaming cut	slow stream	moderate streaming	streaming	fast streaming	instant
Colour of Cut	colourless		pale yellow	yellow	dark yellow	light orange	orange	dark brown		very dark brown opaque
Residue on spot plate	trace	heavy trace	v.thin ring	thin ring	thick ring	v.thick ring	thin film	thin film	thick film	solid

HYDROCARBON RECOVERY (FIT, DST RESULTS): FIT 1 @ 8988' Rec 47.66 ft^3 gas + 1500 cc condensate & 13000 cc water/filtrate

WELL NAME PELICAN 4	FORMATION EVCM							DRILLING FLUIDS							CUTTINGS	
DEPTH INTERVAL	F/M	L/D	T	R	VP	HW	SOURCE	HOT WIRE		CHROMATOGRAPHIC ANALYSIS (PPM)					TOTAL GAS	TOTAL METHANE
								TOTAL	BACKGROUND	C1	C2	C3	C4	C5		
9250 - 9275	F	D	O	7	1	4	ML/WCR	5	5	2000	200	120	50			

LITHOLOGICAL DESCRIPTION: 1. SST, white, buff, firm-hard, med-grain, mod well std, sub-ang, quartzose, mica in part, sli carb, sli calc cmtd

DESCRIPTION OF FLUORESCENCE: ☐ No fluorescence

Percent sample with fluorescence	trace	10	20	30	40	50	60	70	80	>90
Fluorescence appearance	trace		spotted			streaked		patchy		solid
Brightness of fluorescence	v.dull		dull		dim			bright	v.bright	glowing
Colour of fluorescence	blue-white		white		green	yellow		gold (orange)		brown
Type of cut	trace	v.slow crush cut	crush cut	instant crush cut	v.slow streaming cut	slow stream	moderate streaming	streaming	fast streaming	instant
Colour of Cut	colourless		pale yellow	yellow	dark yellow	light orange	orange	dark brown		very dark brown opaque
Residue on spot plate	trace	heavy trace	v.thin ring	thin ring	thick ring	v.thick ring	thin film	thin film	thick film	solid

HYDROCARBON RECOVERY (FIT, DST RESULTS): REC 1 @ 9265' Rec 0.09 ft^3 gas + 125 cc condensate & 10725 cc filtrate/water

WELL NAME PELICAN 4	FORMATION EVCM							DRILLING FLUIDS							CUTTINGS	
DEPTH INTERVAL	F/M	L/D	T	R	VP	HW	SOURCE	HOT WIRE		CHROMATOGRAPHIC ANALYSIS (PPM)					TOTAL GAS	TOTAL METHANE
								TOTAL	BACKGROUND	C1	C2	C3	C4	C5		
9425 - 9535	F	D	H	7		4	ML	170	10	70000	11000	7000	1500	700		

LITHOLOGICAL DESCRIPTION: 1. SST, buff, mod friable, med grain, mod std, sub-ang, white argil cmt

DESCRIPTION OF FLUORESCENCE: ☒ No fluorescence

Percent sample with fluorescence	trace	10	20	30	40	50	60	70	80	>90
Fluorescence appearance	trace		spotted			streaked		patchy		solid
Brightness of fluorescence	v.dull		dull		dim			bright	v.bright	glowing
Colour of fluorescence	blue-white		white		green	yellow		gold (orange)		brown
Type of cut	trace	v.slow crush cut	crush cut	instant crush cut	v.slow streaming cut	slow stream	moderate streaming	streaming	fast streaming	instant
Colour of Cut	colourless		pale yellow	yellow	dark yellow	light orange	orange	dark brown		very dark brown opaque
Residue on spot plate	trace	heavy trace	v.thin ring	thin ring	thick ring	v.thick ring	thin film	thin film	thick film	solid

HYDROCARBON RECOVERY (FIT, DST RESULTS): RFT 3 @ 9464' Rec 69.5 ft^3 gas + 900 cc condensate & 11400 cc filtrate

WELL NAME PELICAN 4	FORMATION EVCM							DRILLING FLUIDS							CUTTINGS	
DEPTH INTERVAL	F/M	L/D	T	R	VP	HW	SOURCE	HOT WIRE		CHROMATOGRAPHIC ANALYSIS (PPM)					TOTAL GAS	TOTAL METHANE
								TOTAL	BACKGROUND	C1	C2	C3	C4	C5		
9905 - 9925	F	D	G	5		4	HW	90	2	60000	4000	1500	300	20		

LITHOLOGICAL DESCRIPTION: 1. SST, white-buff, f-med grain, mod friable, white clay matrix

DESCRIPTION OF FLUORESCENCE: ☒ No fluorescence

Percent sample with fluorescence	trace	10	20	30	40	50	60	70	80	>90
Fluorescence appearance	trace		spotted			streaked		patchy		solid
Brightness of fluorescence	v.dull		dull		dim			bright	v.bright	glowing
Colour of fluorescence	blue-white		white		green	yellow		gold (orange)		brown
Type of cut	trace	v.slow crush cut	crush cut	instant crush cut	v.slow streaming cut	slow stream	moderate streaming	streaming	fast streaming	instant
Colour of Cut	colourless		pale yellow	yellow	dark yellow	light orange	orange	dark brown		very dark brown opaque
Residue on spot plate	trace	heavy trace	v.thin ring	thin ring	thick ring	v.thick ring	thin film	thin film	thick film	solid

HYDROCARBON RECOVERY (FIT, DST RESULTS):

WELL NAME PELICAN 5	FORMATION EVCM							DRILLING FLUIDS							CUTTINGS	
DEPTH INTERVAL	F/M	L/D	T	R	VP	HW	SOURCE	HOT WIRE		CHROMATOGRAPHIC ANALYSIS (PPM)					TOTAL GAS	TOTAL METHANE
								TOTAL	BACKGROUND	C1	C2	C3	C4	C5		
2564 - 2580	M	D	G		5			35	8	4000	400	200				
2808 - 2844	M	D	G		5			45	5	6000	800	600				

LITHOLOGICAL DESCRIPTION:

1. vf-f gr, clr sbang-sbrd, wsrt, tr intstl cly, con sil cmt, occ qte o'gths, fri-lse,
2. mlky wh-clr, f gr, mod w srt, sbang-sbrd, wk dol + sil cmt, cln, uncons - easily fri qtz o'gths

DESCRIPTION OF FLUORESCENCE: ☒ No fluorescence

Percent sample with fluorescence	trace	10	20	30	40	50	60	70	80	>90
Fluorescence appearance	trace		spotted			streaked		patchy		solid
Brightness of fluorescence	v.dull		dull		dim			bright	v.bright	glowing
Colour of fluorescence	blue-white		white		green	yellow		gold (orange)		brown
Type of cut	trace	v.slow crush cut	crush cut	instant crush cut	v.slow streaming cut	slow stream	moderate streaming	streaming	fast streaming	instant
Colour of Cut	colourless		pale yellow	yellow	dark yellow	light orange	orange	dark brown		very dark brown opaque
Residue on spot plate	trace	heavy trace	v.thin ring	thin ring	thick ring	v.thick ring	thin film	thin film	thick film	solid

HYDROCARBON RECOVERY (FIT, DST RESULTS): DST 5: 2869-2833 well flowed back some gas and condensate then went to water at 12 BBLS/day

WELL NAME PELICAN 5	FORMATION EVCM							DRILLING FLUIDS							CUTTINGS	
DEPTH INTERVAL	F/M	L/D	T	R	VP	HW	SOURCE	HOT WIRE		CHROMATOGRAPHIC ANALYSIS (PPM)					TOTAL GAS	TOTAL METHANE
								TOTAL	BACKGROUND	C1	C2	C3	C4	C5		
3042 - 3106	M	D	G		2		ML	400	30	35000	5800	2500				
3141 - 3162	M	D	G		0		ML	600	50	60000	10000	4200				

LITHOLOGICAL DESCRIPTION:

1. Off wh-clr vf-f gr, mod srt, ang-sbrd, mod sil cmt, mnr dol cmt, tr wh arg mtx, occ slty, intlam w/sltst
2. Clr-opq, lse qz, f-m, sbrnd-sbang, mod srt, loo cons w/wh mtx, sll cmt

DESCRIPTION OF FLUORESCENCE: ☒ No fluorescence

Percent sample with fluorescence	trace	10	20	30	40	50	60	70	80	>90
Fluorescence appearance	trace		spotted			streaked		patchy		solid
Brightness of fluorescence	v.dull		dull		dim			bright	v.bright	glowing
Colour of fluorescence	blue-white		white		green	yellow		gold (orange)		brown
Type of cut	trace	v.slow crush cut	crush cut	instant crush cut	v.slow streaming cut	slow stream	moderate streaming	streaming	fast streaming	instant
Colour of Cut	colourless		pale yellow	yellow	dark yellow	light orange	orange	dark brown		very dark brown opaque
Residue on spot plate	trace	heavy trace	v.thin ring	thin ring	thick ring	v.thick ring	thin film	thin film	thick film	solid

HYDROCARBON RECOVERY (FIT, DST RESULTS): DST 4: 3143 - 3162 430 MCFD, 1" choke 35 PSI, ftp sg gas 0.87 (9% CO_2)

WELL NAME PELICAN 5	FORMATION EVCM							DRILLING FLUIDS							CUTTINGS	
DEPTH INTERVAL	F/M	L/D	T	R	VP	HW	SOURCE	HOT WIRE		CHROMATOGRAPHIC ANALYSIS (PPM)					TOTAL GAS	TOTAL METHANE
								TOTAL	BACKGROUND	C1	C2	C3	C4	C5		
2704 - 2794	M	D	O				ML	350	20	20000	3000	1500		30		

LITHOLOGICAL DESCRIPTION:

DESCRIPTION OF FLUORESCENCE: ☐ No fluorescence

Percent sample with fluorescence	trace	10	20	30	40	50	60	70	80	>90
Fluorescence appearance	trace		spotted			streaked		patchy		solid
Brightness of fluorescence	v.dull		dull		dim			bright	v.bright	glowing
Colour of fluorescence	blue-white		white		green	yellow		gold (orange)		brown
Type of cut	trace	v.slow crush cut	crush cut	instant crush cut	v.slow streaming cut	slow stream	moderate streaming	streaming	fast streaming	instant
Colour of Cut	colourless		pale yellow	yellow	dark yellow	light orange	orange	dark brown		very dark brown opaque
Residue on spot plate	trace	heavy trace	v.thin ring	thin ring	thick ring	v.thick ring	thin film	thin film	thick film	solid

HYDROCARBON RECOVERY (FIT, DST RESULTS): DST 6: 2786 - 2790 5.5 MCFD, 400 BCPD, 675 BWPD, 1" choke 520 PSI, ftp sg gas 0.84 (9% CO_2)

WELL NAME PELICAN 5	FORMATION EVCM							DRILLING FLUIDS							CUTTINGS	
DEPTH INTERVAL	F/M	L/D	T	R	VP	HW	SOURCE	HOT WIRE		CHROMATOGRAPHIC ANALYSIS (PPM)					TOTAL GAS	TOTAL METHANE
								TOTAL	BACKGROUND	C1	C2	C3	C4	C5		
3590 - 3620	M	D	G		3		ML	90	20	70000	10000	7000	2000	800		
3660 - 3670	M	D	G		0		ML	45	10	5000	750	200				

LITHOLOGICAL DESCRIPTION:

1. ?
2. Clr-off wh, f-occ.M, Fr, Sub ang-sub rnd, occ sil cmt + hd, com lse w/ogths

DESCRIPTION OF FLUORESCENCE: ☒ No fluorescence

Percent sample with fluorescence	trace	10	20	30	40	50	60	70	80	>90
Fluorescence appearance	trace		spotted			streaked		patchy		solid
Brightness of fluorescence	v.dull		dull		dim			bright	v.bright	glowing
Colour of fluorescence	blue-white		white		green	yellow		gold (orange)		brown
Type of cut	trace	v.slow crush cut	crush cut	instant crush cut	v.slow streaming cut	slow stream	moderate streaming	streaming	fast streaming	instant
Colour of Cut	colourless		pale yellow	yellow	dark yellow	light orange	orange	dark brown		very dark brown opaque
Residue on spot plate	trace	heavy trace	v.thin ring	thin ring	thick ring	v.thick ring	thin film	thin film	thick film	solid

HYDROCARBON RECOVERY (FIT, DST RESULTS): DST 1: 3672 - 3699 No recov
DST 2: 3607 - 3619 Reversed out 1410 units of gas
DST 2A: 3611 - 3617 No recov

WELL NAME PELICAN 5	FORMATION EVCM							DRILLING FLUIDS							CUTTINGS	
DEPTH INTERVAL	F/M	L/D	T	R	VP	HW	SOURCE	HOT WIRE		CHROMATOGRAPHIC ANALYSIS (PPM)					TOTAL GAS	TOTAL METHANE
								TOTAL	BACKGROUND	C1	C2	C3	C4	C5		
3750 - 3760	M	D	G		5		ML	50	3	4800	800	300	300	10		
3770 - 3780	M	D	G		3		ML	70	3	8000	1500	450	80			
3870 - 3880	M	D	G		3		ML	65	15	7000	1300	400				

LITHOLOGICAL DESCRIPTION:

1. Off wh-clr sb rnd, mod srtd, rr, inststl, cly, mod w sil cmt, rr calc cmt
2. Off wh-clr occ lt brn, vf-f dom f, mod-w sr, sbang-sbrnd, wk-mod calc cmt tr wa arg mtx in pt
3. Off wh-clr vf-f dom f, mod srtd, sbang, mod calc sht, sil cmt in pt, tr wh arg tmtx, fri

DESCRIPTION OF FLUORESCENCE: ☒ No fluorescence

Percent sample with fluorescence	trace	10	20	30	40	50	60	70	80	>90
Fluorescence appearance	trace		spotted			streaked		patchy		solid
Brightness of fluorescence	v.dull		dull		dim			bright	v.bright	glowing
Colour of fluorescence	blue-white		white		green	yellow		gold (orange)		brown
Type of cut	trace	v.slow crush cut	crush cut	instant crush cut	v.slow streaming cut	slow stream	moderate streaming	streaming	fast streaming	instant
Colour of Cut	colourless		pale yellow	yellow	dark yellow	light orange	orange	dark brown		very dark brown opaque
Residue on spot plate	trace	heavy trace	v.thin ring	thin ring	thick ring	v.thick ring	thin film	thin film	thick film	solid

HYDROCARBON RECOVERY (FIT, DST RESULTS):

WELL NAME PELICAN 5	FORMATION EVCM							DRILLING FLUIDS							CUTTINGS	
DEPTH INTERVAL	F/M	L/D	T	R	VP	HW	SOURCE	HOT WIRE		CHROMATOGRAPHIC ANALYSIS (PPM)					TOTAL GAS	TOTAL METHANE
								TOTAL	BACKGROUND	C1	C2	C3	C4	C5		
3820 - 3850	M	D	G		3		ML	80	15	9000	1500	600				
3890 - 3910	M	D	G		3		ML	220	20	15000	2000	800	125	20		
3950 - 3960	M	D	G		3		ML	300	30	20000	3000	1200	300	40		

LITHOLOGICAL DESCRIPTION:

1. Off wh-clr vf-f dom f mod srtd, sbang, mod calc cht, sil cmt in pt, tr wh arg mtx, fri
2. A.A.
3. Off wh-cl f-occ m, dom f, mod srt, sang-srnd, mod calc, tr wh arg mtx, fr

DESCRIPTION OF FLUORESCENCE: ☒ No fluorescence

Percent sample with fluorescence	trace	10	20	30	40	50	60	70	80	>90
Fluorescence appearance	trace		spotted			streaked		patchy		solid
Brightness of fluorescence	v.dull		dull		dim			bright	v.bright	glowing
Colour of fluorescence	blue-white		white		green	yellow		gold (orange)		brown
Type of cut	trace	v.slow crush cut	crush cut	instant crush cut	v.slow streaming cut	slow stream	moderate streaming	streaming	fast streaming	instant
Colour of Cut	colourless		pale yellow	yellow	dark yellow	light orange	orange	dark brown		very dark brown opaque
Residue on spot plate	trace	heavy trace	v.thin ring	thin ring	thick ring	v.thick ring	thin film	thin film	thick film	solid

HYDROCARBON RECOVERY (FIT, DST RESULTS):

WELL NAME PELICAN 5	FORMATION EVCM							DRILLING FLUIDS							CUTTINGS	
DEPTH INTERVAL	F/M	L/D	T	R	VP	HW	SOURCE	HOT WIRE		CHROMATOGRAPHIC ANALYSIS (PPM)					TOTAL GAS	TOTAL METHANE
								TOTAL	BACKGROUND	C1	C2	C3	C4	C5		
4020 - 4040	M	D	G		1		ML	250	25	15000	2500	1000	150	20		
4110 - 4120	M	D	G		1		ML	320	20	35000	4500	900	150	20		

LITHOLOGICAL DESCRIPTION:

1. Off wh, cl vf-f, occ m, dom f, mod-w srt, sub ang-sub rnd, mod-occ strong calc cmt, abnt wh arg mtx, fri
2. Cl off wh f-occm, occ crs, ang-sub ang, pr-fr srt, com sil cmt, dom as qtz, ougths, sl calc/dolm in pt, tr arg mtx, ocg ltcs

DESCRIPTION OF FLUORESCENCE: ☒ No fluorescence

Percent sample with fluorescence	trace	10	20	30	40	50	60	70	80	>90
Fluorescence appearance	trace		spotted			streaked		patchy		solid
Brightness of fluorescence	v.dull		dull		dim			bright	v.bright	glowing
Colour of fluorescence	blue-white		white		green	yellow		gold (orange)		brown
Type of cut	trace	v.slow crush cut	crush cut	instant crush cut	v.slow streaming cut	slow stream	moderate streaming	streaming	fast streaming	instant
Colour of Cut	colourless		pale yellow	yellow	dark yellow	light orange	orange	dark brown		very dark brown opaque
Residue on spot plate	trace	heavy trace	v.thin ring	thin ring	thick ring	v.thick ring	thin film	thin film	thick film	solid

HYDROCARBON RECOVERY (FIT, DST RESULTS):

WELL NAME PELICAN 5	FORMATION EVCM							DRILLING FLUIDS							CUTTINGS	
DEPTH INTERVAL	F/M	L/D	T	R	VP	HW	SOURCE	HOT WIRE		CHROMATOGRAPHIC ANALYSIS (PPM)					TOTAL GAS	TOTAL METHANE
								TOTAL	BACKGROUND	C1	C2	C3	C4	C5		
4150 - 4160	M	D	G		2		ML	270	20	20000	3000	600	95	20		
4166 - 4174	M	D	G				ML	50	10	6000	1000	200	30	20		

LITHOLOGICAL DESCRIPTION: 1. Clr, vf-f gr mod srt, sbang-occ sb rnd, mod sil cmt, rr calc cmt, qtz o'gwth, rr slty mtx, rr lithic frag

DESCRIPTION OF FLUORESCENCE: ☒ No fluorescence

Percent sample with fluorescence	trace	10	20	30	40	50	60	70	80	>90
Fluorescence appearance	trace		spotted			streaked		patchy		solid
Brightness of fluorescence	v.dull		dull		dim			bright	v.bright	glowing
Colour of fluorescence	blue-white		white		green	yellow		gold (orange)		brown
Type of cut	trace	v.slow crush cut	crush cut	instant crush cut	v.slow streaming cut	slow stream	moderate streaming	streaming	fast streaming	instant
Colour of Cut	colourless		pale yellow	yellow	dark yellow	light orange	orange	dark brown		very dark brown opaque
Residue on spot plate	trace	heavy trace	v.thin ring	thin ring	thick ring	v.thick ring	thin film	thin film	thick film	solid

HYDROCARBON RECOVERY (FIT, DST RESULTS):

WELL NAME PIPIPA 1	FORMATION EVCM							DRILLING FLUIDS							CUTTINGS	
DEPTH INTERVAL	F/M	L/D	T	R	VP	HW	SOURCE	HOT WIRE		CHROMATOGRAPHIC ANALYSIS (PPM)					TOTAL GAS	TOTAL METHANE
								TOTAL	BACKGROUND	C1	C2	C3	C4	C5		
1530 - 1545	M	D	H	3		4	ML	20	3	9000						
5020 - 5069	F															

LITHOLOGICAL DESCRIPTION: 1. SST, clear, milky, med grained to granular, ang to sub-ang, poorly std, predom loose, dolomitic

DESCRIPTION OF FLUORESCENCE: ☒ No fluorescence

Percent sample with fluorescence	trace	10	20	30	40	50	60	70	80	>90
Fluorescence appearance	trace		spotted			streaked		patchy		solid
Brightness of fluorescence	v.dull		dull		dim			bright	v.bright	glowing
Colour of fluorescence	blue-white		white		green	yellow		gold (orange)		brown
Type of cut	trace None	v.slow crush cut	crush cut	instant crush cut	v.slow streaming cut	slow stream	moderate streaming	streaming	fast streaming	instant
Colour of Cut	colourless		pale yellow	yellow	dark yellow	light orange	orange	dark brown		very dark brown opaque
Residue on spot plate	trace	heavy trace	v.thin ring	thin ring	thick ring	v.thick ring	thin film	thin film	thick film	solid

HYDROCARBON RECOVERY (FIT, DST RESULTS):

WELL NAME PIPIPA 1	FORMATION EVCM							DRILLING FLUIDS							CUTTINGS	
DEPTH INTERVAL	F/M	L/D	T	R	VP	HW	SOURCE	HOT WIRE		CHROMATOGRAPHIC ANALYSIS (PPM)					TOTAL GAS	TOTAL METHANE
								TOTAL	BACKGROUND	C1	C2	C3	C4	C5		
1762 - 1780	M	D	G	1		4	HW	8	1	4000	450					
5781 - 5840	F															

LITHOLOGICAL DESCRIPTION: 1. SST, white, predom med grained, sub-ang, well std, silty matrix, occ argill matrix

DESCRIPTION OF FLUORESCENCE: ☐ No fluorescence

Percent sample with fluorescence	trace	10	20	30	40	50	60	70	80	>90
Fluorescence appearance	trace		spotted			streaked		patchy		solid
Brightness of fluorescence	v.dull		dull		dim			bright	v.bright	glowing
Colour of fluorescence	blue-white		white		green	yellow		gold (orange)		brown
Type of cut	trace	v.slow crush cut	crush cut	instant crush cut	v.slow streaming cut	slow stream	moderate streaming	streaming	fast streaming	instant
Colour of Cut	colourless		pale yellow	yellow	dark yellow	light orange	orange	dark brown		very dark brown opaque
Residue on spot plate	trace	heavy trace	v.thin ring	thin ring	thick ring	v.thick ring	thin film	thin film	thick film	solid

HYDROCARBON RECOVERY (FIT, DST RESULTS):

WELL NAME PIPIPA 1	FORMATION EVCM							DRILLING FLUIDS							CUTTINGS	
DEPTH INTERVAL	F/M	L/D	T	R	VP	HW	SOURCE	HOT WIRE		CHROMATOGRAPHIC ANALYSIS (PPM)					TOTAL GAS	TOTAL METHANE
								TOTAL	BACKGROUND	C1	C2	C3	C4	C5		
1940 - 1960	M	D	0	7	3	4	ML	10	8	2300	3200	1400	800	5		
6365 - 6431	F							Note: Max Gas 44 units Ass with coal								

LITHOLOGICAL DESCRIPTION: 1. SST, white, vf-med grained, mod std, silty matrix, poorly cmtd

DESCRIPTION OF FLUORESCENCE: ☐ No fluorescence

Percent sample with fluorescence	trace	10	20	30	40	50	60	70	80	>90
Fluorescence appearance	trace		spotted			streaked		patchy		solid
Brightness of fluorescence	v.dull		dull		dim			bright	v.bright	glowing
Colour of fluorescence	blue-white		white		green	yellow		gold (orange)		brown
Type of cut	trace	v.slow crush cut	crush cut	instant crush cut	v.slow streaming cut	slow stream	moderate streaming	streaming	fast streaming	instant
Colour of Cut	colourless	milky white	pale yellow	yellow	dark yellow	light orange	orange	dark brown		very dark brown opaque
Residue on spot plate	trace	heavy trace	v.thin ring	thin ring	thick ring	v.thick ring	thin film	thin film	thick film	solid

HYDROCARBON RECOVERY (FIT, DST RESULTS):

WELL NAME **PIPIPA 1**	FORMATION EVCM							DRILLING FLUIDS							CUTTINGS	
DEPTH INTERVAL	F/M	L/D	T	R	VP	HW	SOURCE	HOT WIRE		CHROMATOGRAPHIC ANALYSIS (PPM)					TOTAL GAS	TOTAL METHANE
								TOTAL	BACKGROUND	C1	C2	C3	C4	C5		
1990 - 2060	M	D	0	7	1	4	ML	12	5	1500	1400	1300	600	180		
6529 - 6759	F													+75 C6		

LITHOLOGICAL DESCRIPTION: Intbd sst siltst & shale, minor coal. SST: dirty white, med to occ coarse grained, sub-ang, well std, firm to unconsolidated, silty. The amount of fluor ranged from 0-40%, Av 10-15%?

DESCRIPTION OF FLUORESCENCE: ☐ No fluorescence

Percent sample with fluorescence	trace	10	20	30	40	50	60	70	80	>90
Fluorescence appearance	trace		spotted			streaked		patchy		solid
Brightness of fluorescence	v.dull		dull		dim			bright	v.bright	glowing
Colour of fluorescence	blue-white		white		green	yellow		gold (orange)		brown
Type of cut	trace	v.slow crush cut	crush cut	instant crush cut	v.slow streaming cut	slow stream	moderate streaming	streaming	fast streaming	instant
Colour of Cut	colourless	white	pale yellow	yellow	dark yellow	light orange	orange	dark brown		very dark brown opaque
Residue on spot plate	trace	heavy trace	v.thin ring	thin ring	thick ring	v.thick ring	thin film	thin film	thick film	solid

HYDROCARBON RECOVERY (FIT, DST RESULTS):

WELL NAME PIPIPA 1	FORMATION EVCM							DRILLING FLUIDS							CUTTINGS	
DEPTH INTERVAL	F/M	L/D	T	R	VP	HW	SOURCE	HOT WIRE		CHROMATOGRAPHIC ANALYSIS (PPM)					TOTAL GAS	TOTAL METHANE
								TOTAL	BACKGROUND	C1	C2	C3	C4	C5		
2080 - 2095	M	D	0	3	2	4	ML	12	8	2100	1900	1400	220	100		
1824 - 6874	F															

LITHOLOGICAL DESCRIPTION: SST, predom white occ grey-brown, f-med grained, sub-ang, silty, well std, & mineral fluor?

DESCRIPTION OF FLUORESCENCE: ☐ No fluorescence

Percent sample with fluorescence	trace	10	20	30	40	50	60	70	80	>90
Fluorescence appearance	trace		spotted			streaked		patchy		solid
Brightness of fluorescence	v.dull		dull		dim			bright	v.bright	glowing
Colour of fluorescence	blue-white		white		green	yellow		gold (orange)		brown
Type of cut	trace None	v.slow crush cut	crush cut	instant crush cut	v.slow streaming cut	slow stream	moderate streaming	streaming	fast streaming	instant
Colour of Cut	colourless		pale yellow	yellow	dark yellow	light orange	orange	dark brown		very dark brown opaque
Residue on spot plate	trace	heavy trace	v.thin ring	thin ring	thick ring	v.thick ring	thin film	thin film	thick film	solid

HYDROCARBON RECOVERY (FIT, DST RESULTS):

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WELL NAME POONBOON 1	FORMATION TORQUAY/DB/EVCM							DRILLING FLUIDS							CUTTINGS	
DEPTH INTERVAL	F/M	L/D	T	R	VP	HW	SOURCE	HOT WIRE		CHROMATOGRAPHIC ANALYSIS (PPM)					TOTAL GAS	TOTAL METHANE
								TOTAL	BACKGROUND	C1	C2	C3	C4	C5		
4760 - 4940 TOR	F	D	G	1		6	HW	10	2	1200						
5390 - 5690 TOR	F	D	G	1	4	6	HW	10	3	2000						
5930 - 6010 DB	F	D	G	1	4	6	HW	5	5	2200						
6170 - 6260 EVCM	F	D	G	1	4	6	HW	8	3	2200						

LITHOLOGICAL DESCRIPTION:

1. Siltst, brown, sandy, slightly glauc, slightly foss, calc, trace pyrite, firm
2. Siltst, as above but non-foss
3. As for 2 above
4. A/A, tr dol, sandy:f-grained

DESCRIPTION OF FLUORESCENCE: ☒ No fluorescence

Percent sample with fluorescence	trace	10	20	30	40	50	60	70	80	>90
Fluorescence appearance	trace		spotted			streaked		patchy		solid
Brightness of fluorescence	v.dull		dull		dim			bright	v.bright	glowing
Colour of fluorescence	blue-white		white		green	yellow		gold (orange)		brown
Type of cut	trace	v.slow crush cut	crush cut	instant crush cut	v.slow streaming cut	slow stream	moderate streaming	streaming	fast streaming	instant
Colour of Cut	colourless		pale yellow	yellow	dark yellow	light orange	orange	dark brown		very dark brown opaque
Residue on spot plate	trace	heavy trace	v.thin ring	thin ring	thick ring	v.thick ring	thin film	thin film	thick film	solid

HYDROCARBON RECOVERY (FIT, DST RESULTS):

WELL NAME POONBOON 1	FORMATION EVCM							DRILLING FLUIDS							CUTTINGS	
DEPTH INTERVAL	F/M	L/D	T	R	VP	HW	SOURCE	HOT WIRE		CHROMATOGRAPHIC ANALYSIS (PPM)					TOTAL GAS	TOTAL METHANE
								TOTAL	BACKGROUND	C1	C2	C3	C4	C5		
7300 - 7400*	F	D	O	1		6	ML	2	2	200						
* Depth at which																
show occurred is																
uncertain																

LITHOLOGICAL DESCRIPTION: 1. Siltst, light grey-white, v slightly calc, hard

DESCRIPTION OF FLUORESCENCE: ☐ No fluorescence

Percent sample with fluorescence	trace	10	20	30	40	50	60	70	80	>90
Fluorescence appearance	trace		spotted			streaked		patchy		solid
Brightness of fluorescence	v.dull		dull		dim			bright	v.bright	glowing
Colour of fluorescence	blue-white		white		green	yellow		gold (orange)		brown
Type of cut	trace	v.slow crush cut	crush cut	instant crush cut	v.slow streaming cut	slow stream	moderate streaming	streaming	fast streaming	instant
Colour of Cut	colourless		pale yellow	yellow	dark yellow	light orange	orange	dark brown		very dark brown opaque
Residue on spot plate	trace	heavy trace	v.thin ring	thin ring	thick ring	v.thick ring	thin film	thin film	thick film	solid

HYDROCARBON RECOVERY (FIT, DST RESULTS):

WELL NAME POONBOON 1	FORMATION EVCM							DRILLING FLUIDS							CUTTINGS	
DEPTH INTERVAL	F/M	L/D	T	R	VP	HW	SOURCE	HOT WIRE		CHROMATOGRAPHIC ANALYSIS (PPM)					TOTAL GAS	TOTAL METHANE
								TOTAL	BACKGROUND	C1	C2	C3	C4	C5		
8810 - 8822	F	L	O	1	3	6	WCR	2	2	200						

LITHOLOGICAL DESCRIPTION: 1. SST, f g-med grained, carbonaceous, well-std, sub-ang to sub-rnd, well con

DESCRIPTION OF FLUORESCENCE: ☐ No fluorescence

Percent sample with fluorescence	trace	10	20	30	40	50	60	70	80	>90
Fluorescence appearance	trace		spotted			streaked		patchy		solid
Brightness of fluorescence	v.dull		dull		dim			bright	v.bright	glowing
Colour of fluorescence	blue-white		white		green	yellow		gold (orange)		brown
Type of cut	trace	v.slow crush cut	crush cut	instant crush cut	v.slow streaming cut	slow stream	moderate streaming	streaming	fast streaming	instant
Colour of Cut	colourless		pale yellow	yellow	dark yellow	light orange	orange	dark brown		very dark brown opaque
Residue on spot plate	trace	heavy trace	v.thin ring	thin ring	thick ring	v.thick ring	thin film	thin film	thick film	solid

HYDROCARBON RECOVERY (FIT, DST RESULTS):

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WELL NAME POONBOON 1	FORMATION EVCM							DRILLING FLUIDS							CUTTINGS	
DEPTH INTERVAL	F/M	L/D	T	R	VP	HW	SOURCE	HOT WIRE		CHROMATOGRAPHIC ANALYSIS (PPM)					TOTAL GAS	TOTAL METHANE
								TOTAL	BACKGROUND	C1	C2	C3	C4	C5		
9000 - 9040	F	D	O	5	3	6	ML	2	2	200						
9580 - 9590	F	D	O	5	3	6	ML	2	2	200						

LITHOLOGICAL DESCRIPTION: 1. SST, light/grey/white - tan-cream, v.f-f grained, loosely consol, calc matrix
* Both intervals-similar show

DESCRIPTION OF FLUORESCENCE: ☐ No fluorescence

Percent sample with fluorescence	trace	10	20	30	40	50	60	70	80	>90
Fluorescence appearance	trace		spotted			streaked		patchy		solid
Brightness of fluorescence	v.dull		dull		dim			bright	v.bright	glowing
Colour of fluorescence	blue-white		white		green	yellow		gold (orange)		brown
Type of cut	trace	v.slow crush cut	crush cut	instant crush cut	v.slow streaming cut	slow stream	moderate streaming	streaming	fast streaming	instant
Colour of Cut	colourless		pale yellow	yellow	dark yellow	light orange	orange	dark brown		very dark brown opaque
Residue on spot plate	trace	heavy trace	v.thin ring	thin ring	thick ring	v.thick ring	thin film	thin film	thick film	solid

HYDROCARBON RECOVERY (FIT, DST RESULTS):

WELL NAME POONBOON 1	FORMATION EVCM							DRILLING FLUIDS							CUTTINGS	
DEPTH INTERVAL	F/M	L/D	T	R	VP	HW	SOURCE	HOT WIRE		CHROMATOGRAPHIC ANALYSIS (PPM)					TOTAL GAS	TOTAL METHANE
								TOTAL	BACKGROUND	C1	C2	C3	C4	C5		
8940 - 9000	F	D	O	3	3	6	ML	2	2	200						
9110 - 9160	F	D	O	3	3	6	ML	2	2	200						
9250 - 9310	F	D	O	3	3	6	ML	2	2	200						
9350 - 9380	F	D	O	3	3	6	ML	2	2	200						

LITHOLOGICAL DESCRIPTION: 1. SST, light grey-white, f-med grained, moderately sorted, sub-ang, slightly calc, mod-well consolidated, slightly mica, carb
* All intervals similar lithology & show
* Both intervals-similar show

DESCRIPTION OF FLUORESCENCE: ☐ No fluorescence

Percent sample with fluorescence	trace	10	20	30	40	50	60	70	80	>90
Fluorescence appearance	trace		spotted			streaked		patchy		solid
Brightness of fluorescence	v.dull		dull		dim			bright	v.bright	glowing
Colour of fluorescence	blue-white		white		green	yellow		gold (orange)		brown
Type of cut	trace None	v.slow crush cut	crush cut	instant crush cut	v.slow streaming cut	slow stream	moderate streaming	streaming	fast streaming	instant
Colour of Cut	colourless		pale yellow	yellow	dark yellow	light orange	orange	dark brown		very dark brown opaque
Residue on spot plate	trace	heavy trace	v.thin ring	thin ring	thick ring	v.thick ring	thin film	thin film	thick film	solid

HYDROCARBON RECOVERY (FIT, DST RESULTS):

WELL NAME POONBOON 1	FORMATION EVCM							DRILLING FLUIDS							CUTTINGS	
DEPTH INTERVAL	F/M	L/D	T	R	VP	HW	SOURCE	HOT WIRE		CHROMATOGRAPHIC ANALYSIS (PPM)					TOTAL GAS	TOTAL METHANE
								TOTAL	BACKGROUND	C1	C2	C3	C4	C5		
9700*	F	L	O	1	3	6	WCR	1	1	200						
9110 - 9160	F	D	O	3	3	6	ML	2	2	200						
9250 - 9310	F	D	O	3	3	6	ML	2	2	200						
9350 - 9380	F	D	O	3	3	6	ML	2	2	200						

LITHOLOGICAL DESCRIPTION: 1. SST, light grey-white, f-med grained, moderately sorted, sub-ang, slightly calc, mod-well consolidated, slightly mica, carb
* All intervals similar lithology & show
* Both intervals-similar show

DESCRIPTION OF FLUORESCENCE: ☐ No fluorescence

Percent sample with fluorescence	trace	10	20	30	40	50	60	70	80	>90
Fluorescence appearance	trace		spotted			streaked		patchy		solid
Brightness of fluorescence	v.dull		dull		dim			bright	v.bright	glowing
Colour of fluorescence	blue-white		white		green	yellow		gold (orange)		brown
Type of cut	trace None	v.slow crush cut	crush cut	instant crush cut	v.slow streaming cut	slow stream	moderate streaming	streaming	fast streaming	instant
Colour of Cut	colourless		pale yellow	yellow	dark yellow	light orange	orange	dark brown		very dark brown opaque
Residue on spot plate	trace	heavy trace	v.thin ring	thin ring	thick ring	v.thick ring	thin film	thin film	thick film	solid

HYDROCARBON RECOVERY (FIT, DST RESULTS):

WELL NAME POONBOON 1	FORMATION EVCM							DRILLING FLUIDS							CUTTINGS	
DEPTH INTERVAL	F/M	L/D	T	R	VP	HW	SOURCE	HOT WIRE		CHROMATOGRAPHIC ANALYSIS (PPM)					TOTAL GAS	TOTAL METHANE
								TOTAL	BACKGROUND	C1	C2	C3	C4	C5		
10420 - 10475	F	D	G	7		6	ML	1600	3	21000	42000	1150	200			
								* Well kicked at 10463 with mud wt = 10.2 ppg Well brought under control with mud at 10.8 inner to 11.1 ppg								

LITHOLOGICAL DESCRIPTION: 1. SST, clear-white, sub-rnd to ang, med to v.coarse grained, uncons, clean

DESCRIPTION OF FLUORESCENCE: ☒ No fluorescence

Percent sample with fluorescence	trace	10	20	30	40	50	60	70	80	>90
Fluorescence appearance	trace		spotted			streaked		patchy		solid
Brightness of fluorescence	v.dull		dull		dim			bright	v.bright	glowing
Colour of fluorescence	blue-white		white		green	yellow		gold (orange)		brown
Type of cut	trace	v.slow crush cut	crush cut	instant crush cut	v.slow streaming cut	slow stream	moderate streaming	streaming	fast streaming	instant
Colour of Cut	colourless		pale yellow	yellow	dark yellow	light orange	orange	dark brown		very dark brown opaque
Residue on spot plate	trace	heavy trace	v.thin ring	thin ring	thick ring	v.thick ring	thin film	thin film	thick film	solid

HYDROCARBON RECOVERY (FIT, DST RESULTS): FIT 2 @ 10434 Rec 1.4 ft³ gas (C1: 170000, C2: 12000, C3: 3500, C4: 800, C5: 300) + 21000 cc water (fresh) & trace sand
FIT 7 @ 10927 Rec 1.1 ft³ gas/5000, 7500, 3000, 1100, 300) + 21000 cc water/fresh

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APPENDIX 6

BMOD PARAMETERS

- **FLINDERS 1**
- **PELICAN 5**
- **PELICAN DEEP**

APPENDIX 6 : BMOD MODELLING PARAMETERS
T/25P Bass Basin Permit Assessment
Albert C. Migliucci / SAGASCO Resources
Model Name: FLINDERS 1
File Name: FLINDERS.MOD
Date: Jul 26, 1994
Time: : 8.15 am

Stratigraphy Table

Formation or Event Name	Type	Begin Age (Ma)	Well Top (m)	Present Thick (m)	Missing Thick (m)	Lithology
Torquay Gp (c)	F	9.5	69.25	830.75		Limestone
Late Miocene Unc	E	10			-50	
Deposition 1	D	10.5			+50	
Torq b						
Torquay Gp (b)	F	20	900	120		
Torq b						
Oligo-Mio Unc	E	23			-600	
Deposition 2	D	35			+600	
Torq c						
Torquay Gp (a)	F	42	1020	394		
Torq c						
Demons Bluff Fm	F	45	1414	110		
DB						
Upper EVCM (b)	F	47	1524	246		
EVCM u						
Base N.asp Unc	E	47.5			-100	
Deposition 3	D	48			+100	
EVCM u						
Upper EVCM (a)	F	50	1770	370		
EVCM u						
Upper M.div Unc	E	51			-400	
Deposition 4	D	52			+400	
EVCM u						
Pelican Zone	F	53	2140	46		
EVCM u						
Intrusive	F	53.02	2186	67		Igneous
Pelican Zone (l)	F	55	2253	207		
EVCM l						
Palaeocene	F	64	2460	240		
EVCM l						
Palaeo-Cret Unc	E	65			-75	
Deposition 5	D	66			+75	
EVCM l						
Unpntrd EVCM	F	92	2700	700		
EVCM l						

Formation or Event Name	Type	Kerogen Name	TOC %	Lith Pat	Lith Color
Torquay Gp (c)	F			4	LightBlue
Late Miocene Unc	E				
Deposition 1	D				
Torquay Gp (b)	F				
Oligo-Mio Unc	E				
Deposition 2	D				
Torquay Gp (a)	F				
Demons Bluff Fm	F			3	LightGreen
Upper EVCM (b)	F	EVCM	10	13	Yellow
Base N.asp Unc	E				
Deposition 3	D	EVCM	10		
Upper EVCM (a)	F	EVCM	10	13	Yellow
Upper M.div Unc	E				
Deposition 4	D				
Pelican Zone	F	EVCM	10		
Intrusive	F				
Pelican Zone (1)	F	EVCM	10		
Palaeocene	F	PALAEO	10		
Palaeo-Cret Unc	E				
Deposition 5	D				
Unpntrd EVCM	F	CRET	7		

Lithology Mixes Table

Lithology Name	Lithology Pattern	% Sandstone	% Siltstone	% Shale	% Limestone
Sandstone	1	100.0			
Siltstone	2		100.0		
Shale	3			100.0	
Limestone	4				100.0
Dolomite	5				
Evaporite	6				
Coal	7				
Igneous	0				
Torq b	1		15		75
Torq c	1		10	60	15
DB	1			80	20
EVCM u	1	55	15	22	
EVCM l	1	38	20	33	

Lithology Name	% Dolomite	% Evaporite	% Kerogen	% Igneous	Total %
Sandstone					100.0
Siltstone					100.0
Shale					100.0
Limestone					100.0
Dolomite	100.0				100.0
Evaporite		100.0			100.0
Coal			100.0		100.0
Igneous				100.0	100.0

Torq b	10		100.0
Torq c	15		100.0
DB			100.0
EVCM u		8	100.0
EVCM l		9	100.0

Lithology Values Table

Lithology Name	Initial Porosity	Compaction Factor (FM)	Exponential Factor (SC)	Density (g/cm^3)	Grain Size (mm)
Sandstone	0.45	1.75	0.27	2.64	0.5
Siltstone	0.55	2.20	0.41	2.64	0.0156
Shale	0.60	2.40	0.51	2.60	0.0004
Limestone	0.60	1.50	0.22	2.72	0.5
Dolomite	0.60	1.50	0.22	2.85	0.5
Evaporite	0.00	0.00	0.00	2.15	0.0004
Coal	0.90	3.50	0.70	1.80	0.0004
Igneous	0.00	0.00	0.00	2.65	0.0001
Torq b	0.59	1.60	0.24	2.721	0.2972
Torq c	0.59	2.11	0.41	2.659	0.0049
DB	0.60	2.22	0.45	2.624	0.0016
EVCM u	0.53	2.10	0.37	2.564	0.0349
EVCM l	0.56	2.21	0.41	2.551	0.0125

Lithology Name	Matrix Conductivity (W/m*deg C)	Heat Capacity (kJ/m^3*deg C)
Sandstone	4.40	2800.
Siltstone	2.00	2650.
Shale	1.50	2100.
Limestone	2.90	2600.
Dolomite	4.80	2600.
Evaporite	5.40	1750.
Coal	0.30	950.0
Igneous	2.90	2500.
Torq b	3.1	2607.
Torq c	2.7	2305.
DB	2.5	2200.
EVCM u	4.0	2475.

Time Values Table

Time (Ma)	Heat Flow (mW/m^2)
.5	62
15	65
20	70
21	150
21.5	70
47	68
64	66
77	65

Bottom Hole Temperature Table

Depth (m)	Temp (deg C)	Delta Time	Circ. Time	Temp Error
1252.0	48.3	7.9	2.9	+-10
1252.0	48.4	8.0		+-10
2718.8	116.7	13.6	1.3	+-20
2718.8	123.3	20.6		+-20
2718.8	126.1	38.1		+-20

Geothermal Gradient Table

Time (Ma)	Depth 1 (m)
0	0

Maturity conversion method: Table
TTI = 4.191876 + 1.817512 * log10(Ro)
Data fit: Least Squares

Measured Ro Table

Depth (m)	Ro
1624	.69
1651	.68
1739	2.63
1911.5	2.56
1981	1.96
2081	2.05
2125	1.81
2143	2.13
2155	1.96
2178	2.19
2304.5	1.89
2344	1.04
2363	.87
2397.5	.7
2417	.72

2456	.64
2461	.69
2504	.75
2511	.69
2553	.7
2599	.69
2607	.68
2672.5	.72
2681.5	.8
2688.5	.72

Measured Pyrolysis Table

Depth (m)	TMAX	S1 (mg/g)	S2 (mg/g)	S3 (mg/g)	TOC %	HI	OI	PI
1623	452	1.57	6.75	.66	10.9	61.92	6.055	0.188
1650	434	.14	.38	.39	1.2	31.66	32.50	0.269
1737	548	.51	1.23	.44	15.8	7.784	2.784	0.293
1911	549	1.93	5.27	.98	58.9	8.947	1.663	0.268
1980	520	1.38	3.84	1.1	9.5	40.42	11.57	0.264
2079	530	.52	1.1	.52	2.6	42.30	20.00	0.320
2124	479	.65	1.12	.88	2.1	53.33	41.90	0.367
2142	539	1.07	2.29	1.01	8.2	27.92	12.31	0.318
2154	493	.48	.89	1.4	2.6	34.23	53.84	0.350
2178	411	.57	.54	.37	11	4.909	3.363	0.513
2304	485	.71	1.14	.36	2.35	48.51	15.31	0.383
2343	457	3.8	6.03	1.72	6.6	91.36	26.06	0.386
2361	449	2.06	5.04	5.17	5.1	98.82	101.3	0.290
2397	434	1.58	11.22	1.58	6	187.0	26.33	0.123
2415	440	1.12	6.19	2.34	3.95	156.7	59.24	0.153
2454	439	.35	2.07	1.54	1.4	147.8	110.0	0.144
2460	433	1.16	11.57	1.67	5.55	208.4	30.09	0.091
2502	436	4.95	62.27	1.68	24.9	250.0	6.746	0.073
2511	436	.61	4.46	1.35	2.5	178.4	54.00	0.120
2547	440	.44	1.61	2.38	2.1	76.66	113.3	0.214
2553	441	.31	1.16	1.63	1.45	80.00	112.4	0.210
2598	434	.37	3.77	1.3	2.55	147.8	50.98	0.089
2607	437	.31	2.73	2.22	2.05	133.1	108.2	0.101
2670	436	1.33	6.63	3.73	4.05	163.7	92.09	0.167
2673	436	1.15	6.46	2.89	4.05	159.5	71.35	0.151
2679	439	4.8	39.02	2.13	17	229.5	12.52	0.109
2688	442	.14	.9	1.97	.74	121.6	266.2	0.134

Event Marker Table

Event Name	Bgn Age (Ma)	End Age (Ma)
Intrusive	20.5	20.4

Model Units

Depth = (m)
Distance = (m)
Thermal Conductivity = (W/m*deg C)
Heat Capacity = (kJ/m^3*deg C)
Heat Flow = (mW/m^2)

Temperature	(deg C)
Gradient	(deg F/100 ft)
Activation Energy	(kcal/mole)
Frequency Factor	(1/my)
HC Density	(g/cm^3)
Seismic Velocity	(m/s)
Event Time	(msec)
Maturity	(%Ro)
HC Generation	(mg/g TOC)

Calculation Options

Compaction	Sclater & Christie
Porosity Depth Method	Linear
Permeability Calculation	Modified Kozeny-Carman
Geothermal Calculation	Steady-State Heat Flow
Use BHT's	Dog Leg
Maturity Calculation	LLNL
Expulsion Calculation	None
Time Interval	1.00
Depth Interval	1000.00
Integrate Depth	Yes

Advanced Options

TTI Reference Temp	105.00
TTI Doubling Temp	10.00
Rock-Eval Correction	35.00
Thermal Gain	1.000
Kinetics Calculation	Quick
Critical Fracturing Fraction	0.850
Fracture Closure Rate	0.050
Conductivity Calculation	Bmod Pre 2.95
Initial S1	3.00

Rifting HF Options

Use Rifting Heat Flow	No
Start Rift Time	0.00
End Rift Time	0.00
Auto-Calc Beta	Yes
Rifting Heat Flow Beta	2.00

Present Day Info

Model Name	FLINDERS 1
Model Description	
Current Surface Temp	10.00
Current Elevation	-91.55
Current Heat Flow	65.00

Well Data

Latitude	0.00000000
Longitude	0.00000000
X	0.00000000
Y	0.00000000
Symbol Code	0.0
KB Elevation	22.30
Well Name	Flinders 1

Abbreviated Well Name = F1/Bass
Unique Id = T25P BASS Flinders

Seismic Parameters
Shot Point =
X = 0.00000000
Y = 0.00000000

BasinMod Data Report /APPENDIX 6
Sagasco Resources /Albert Migliucci
T/25P BASS BASIN PERMIT ASSESSMENT

Model Name: Pelican 5
File Name: PELICAN5.MOD
Date: Jul 25, 1994
Time: 6:53 pm

Stratigraphy Table

Formation or Event Name	Type	Begin Age (Ma)	Well Top (m)	Present Thick (m)	Missing Thick (m)
Torquay Gp (C)	F	9.5	77.4	922.6	
Late Miocene Unc	E	10			-50
Deposition 1	D	10.5			+50
Torquay Gp b	F	21	1000	410	
Olig-Mio Unc	E	23			-400
Deposition 2	D	35			+400
Torquay Gp (A)	F	42	1410	197.7	
Demons Bluff Fm	F	45	1607.7	117.3	
Upper EVCM (B)	F	47	1725	275	
Base N.asp Unc	E	47.5			-100
Deposition 3	D	48			+100
Upper EVCM (A)	F	50	2000	450	
Mid M.diversus U	E	51			-300
Deposition 4	D	52			+300
PELICAN ZONE	F	55	2450	660	
Palaeocene	F	64	3110	400	
Palaeo-Cret Unc	E	65			-50
Deposition 5	D	66			+50
Cretaceous	F	77	3510	735	

Formation or Event Name	Type	Lithology	Kerogen Name	TOC %	Lith Color
Torquay Gp (C)	F	TORQ C			
Late Miocene Unc	E				
Deposition 1	D	TORQ AB			
Torquay Gp b	F	TORQ AB			
Olig-Mio Unc	E				
Deposition 2	D	TORQ AB			
Torquay Gp (A)	F	TORQ AB			

491495

Demons Bluff Fm	F	DB		
Upper EVCM (B)	F	EVB	003070	15
Base N.asp Unc	E			
Deposition 3	D	EVA		
Upper EVCM (A)	F	EVA	003070	15
Mid M.diversus U	E			
Deposition 4	D	PEL		
PELICAN ZONE	F	PEL	003070	10
Palaeocene	F	PALAEO	002080	8
Palaeo-Cret Unc	E			
Deposition 5	D	CRET		
Cretaceous	F	CRET	001585	7

Formation or Event Name	Type
Torquay Gp (C)	F
Late Miocene Unc	E
Deposition 1	D
Torquay Gp b	F
Olig-Mio Unc	E
Deposition 2	D
Torquay Gp (A)	F
Demons Bluff Fm	F
Upper EVCM (B)	F
Base N.asp Unc	E
Deposition 3	D
Upper EVCM (A)	F
Mid M.diversus U	E
Deposition 4	D
PELICAN ZONE	F
Palaeocene	F
Palaeo-Cret Unc	E
Deposition 5	D
Cretaceous	F

Lithology Mixes Table

Lithology Name	Lithology Pattern	% Sandstone	% Siltstone	% Shale	% Limestone
Sandstone	1	100.0			
Siltstone	2		100.0		
Shale	3			100.0	
Limestone	4				100.0

Dolomite	5				
Evaporite	6				
Coal	7				
Igneous	0				
TORQ C					
100					
TORQ AB				90	
10					
DB		3	46	46	
5					
EVB		60	13	15	
EVA		70		15	
PEL		44	26	26	
PALAEO		50	13	35	
CRET		25	30	44	

Lithology Name	% Dolomite	% Evaporite	% Kerogen	% Igneous	Total %
Sandstone					100.0
Siltstone					100.0
Shale					100.0
Limestone					100.0
Dolomite	100.0				100.0

▒

Evaporite		100.0			100.0
Coal			100.0		100.0
Igneous				100.0	100.0
TORQ C					100.0
TORQ AB					100.0
DB					100.0
EVB	2		10		100.0
EVA	2		13		100.0
PEL	1		3		100.0
PALAEO			2		100.0
CRET			1		100.0

Lithology Values Table

Lithology Name	Initial Porosity	Compaction Factor (FM)	Exponential Factor (SC)	Density (g/cm^3)	Grain Size (mm)
Sandstone	0.45	1.75	0.27	2.64	0.5
Siltstone	0.55	2.20	0.41	2.64	0.0156
Shale	0.60	2.40	0.51	2.60	0.0004
Limestone	0.60	1.50	0.22	2.72	

0.5	Dolomite	0.60	1.50	0.22	2.85
0.5	Evaporite	0.00	0.00	0.00	2.15
0.0004	Coal	0.90	3.50	0.70	1.80
0.0004	Igneous	0.00	0.00	0.00	2.65
0.0001	603208	0.53	2.09	0.38	2.560
0.0288	504010	0.55	2.18	0.40	2.540
0.0141	405505	0.55	2.19	0.42	2.576
0.0069	307000	0.55	2.20	0.43	2.612
0.0033	TORQ C	0.60	1.50	0.22	2.720
0.5000	TORQ AB	0.60	2.31	0.48	2.612
0.0008	DB	0.57	2.24	0.44	2.625
0.0038	EVB	0.53	2.07	0.36	2.554
0.0535	EVA	0.53	2.07	0.36	2.529
0.0678	PEL	0.53	2.08	0.38	2.606
0.0256	PALAEO	0.52	2.07	0.38	2.609
0.0227	CRET	0.55	2.18	0.42	2.614
0.0071					

Lithology Name	Matrix Conductivity (W/m*deg C)	Heat Capacity (kJ/m^3*deg C)
Sandstone	4.40	2800.
Siltstone	2.00	2650.
Shale	1.50	2100.
Limestone	2.90	2600.
Dolomite	4.80	2600.
Evaporite	5.40	1750.
Coal	0.30	950.0
Igneous	2.90	2500.
603208	3.144	2428.
504010	2.830	2335.
405505	2.600	2322.
307000	2.370	2310.
TORQ C	2.900	2600.
TORQ AB	2.2	2150.
DB	2.4	2399.
EVB	2.6	2486.

EVA	4.0	2450.
PEL	2.9	2521.
PALAEO	3.5	2498.
CRET	2.7	2428.

Time Values Table

Time (Ma)	Heat Flow (mW/m^2)
.5	62
21	65
47	68
64	66
77	65

Bottom Hole Temperature Table

Depth (m)	Temp (deg C)	Delta Time	Circ. Time	Temp Error
3003.5	95.6			+-20
3649	142.2			+-20
3995	170.6			+-10
4236	178.9			+-10
4248	170.0			+-10
4255	177.8			+-10
4267	172.8	8.5	2	+-10
4267	172.9	11.5		+-10
4267	175.6	16.8		+-10

Geothermal Gradient Table

Time (Ma)	Depth 1 (m)
0	0

Maturity conversion method: Table
TTI = 4.191876 + 1.817512 * log10(Ro)
Data fit: Least Squares

Measured Ro Table

Depth (m)	Ro	Ro Error
1851	.367	.034
1999.4	.565	.043
2169	.523	.037
2322	.539	.034
2593	.662	.049
2745	.77	.076
2790	.727	.089
2937	.693	.122

2961	.823	.066
3123	.882	.049
3357	.961	.085
3474	.991	.065

3627	1.114	.096
3710	1.269	.129
3717	1.233	.094
3789	1.265	.075
3907	1.522	.148
3933	1.418	.077
4032	1.431	.11
4085	1.59	.158
4104	1.403	.096
4185	1.412	.084
4247	1.672	.151

Measured Pyrolysis Table

Depth (m)	TMAX	S1 (mg/g)	S2 (mg/g)	S3 (mg/g)	TOC %	HI	OI	PI
1902	428	0.78	16.11	0.74	17.8	90.50	4.157	0.046
1933	425	0.56	4.56	0.62	1.92	237.5	32.29	0.109
1999	424	8.04	184.48	4.25	60.7	303.9	7.001	0.041
2036	426	0.75	14.86	0.4	3.55	418.5	11.26	0.048
2039	423	5.58	195.07	3.5	65	300.1	5.384	0.027
2046	424	0.35	7.15	0.58	12.2	58.60	4.754	0.046
2064	424	0.71	15.36	0.67	18.1	84.86	3.701	0.044
2118	424	0.43	11.47	0.53	27.8	41.25	1.906	0.036
2172	426	0.37	7.77	0.45	19.8	39.24	2.272	0.045
2190	427	0.59	12.5	0.47	26.7	46.81	1.760	0.045
2208	426	0.34	9.15	0.51	12.2	75.00	4.180	0.035
2223	428	7.33	192.57	2.85	69.6	276.6	4.094	0.036
2226	427	0.53	8.63	0.65	5.35	161.3	12.14	0.057
2242	425	0.59	11.48	0.89	4.1	280.0	21.70	0.048
2278	428	0.65	14.97	0.51	30.7	48.76	1.661	0.041
2296	428	0.59	10.78	0.55	15.6	69.10	3.525	0.051
2298.5	429	12.04	233.06	2.24	68.8	338.7	3.255	0.049
2298.5	429	12.04	233.06	2.24	68.8	338.7	3.255	0.049
2314	429	1.32	11.38	0.48	24.9	45.70	1.927	0.103
2332	423	2.5	19.03	0.84	4.45	427.6	18.87	0.116
2350	428	1.04	13.44	0.48	15.6	86.15	3.076	0.071
2365	434	1.7	23.88	0.43	8.0	298.5	5.375	0.066
2368	428	0.66	9.63	0.4	21.7	44.37	1.843	0.064
2403	430	0.72	13.91	0.62	6.3	220.7	9.841	0.049
2448	429	0.83	13.28	0.45	16.4	80.97	2.743	0.058
2451	428	1.02	16.18	.44	4.7	344.2	9.361	0.059
2451	438	1.02	16.18	0.44	4.7	344.2	9.361	0.059
2464	436	0.38	3.92	0.17	3.5	112.0	4.857	0.088
2475	422	0.86	8.17	1.13	2.94	277.8	38.43	0.095
2511	427	2.36	16.74	0.9	4.65	360.0	19.35	0.123

2517.5	438	0.35	1.78	0.19	0.69	257.9	27.53	0.164
2529	427	2.48	12.9	0.62	3.32	388.5	18.67	0.161
2557	428	0.77	7.45	1.57	2.85	261.4	55.08	0.093
2565	424	1.86	9.19	0.72	3.02	304.3	23.84	0.168
2583	432	5.14	25.50	0.63	8.45	301.7	7.455	0.167
2619	425	1.32	9.25	0.75	2.84	325.7	26.40	0.124
2637	434	0.92	12.4	0.33	11.1	111.7	2.972	0.069
2655	426	0.82	5.37	1.18	2.52	213.0	46.82	0.132
2709	434	1.02	11.49	0.49	3.46	332.0	14.16	0.081
2727	433	1.27	11.01	0.74	3.68	299.1	20.10	0.103
2745	431	0.7	5.37	0.82	2.46	218.2	33.33	0.115
2763	434	1.52	14.24	0.71	4.5	316.4	15.77	0.096
2790	435	3.2	18.76	0.38	39.4	47.61	0.964	0.145
2794	441	27.01	338.76	4.43	79.2	427.7	5.593	0.073
2808	435	0.75	3.89	0.94	2.04	190.6	46.07	0.161
2844	431	2.3	13.09	0.89	3.64	359.6	24.45	0.149
2862	428	2.47	15.22	0.71	18.6	81.82	3.817	0.139
2898	433	0.69	4.01	0.94	1.76	227.8	53.40	0.146
2916	433	1.21	16.08	0.85	4.2	382.8	20.23	0.069
2937	436	0.82	2.52	1.61	1.1	229.0	146.3	0.245
2970	440	1.84	14.76	0.3	17.8	82.92	1.685	0.110
2970.5	442	23.37	235.34	4.06	72.40	325.0	5.607	0.090
2978.5	440	1.06	3.85	1.17	1.56	246.7	75.00	0.215
2988	437	0.62	6.7	0.22	20.6	32.52	1.067	0.084
2991	442	0.72	3.86	2.23	2	193.0	111.5	0.157
3006	439	1.63	9.66	1.04	6.25	154.5	16.64	0.144
3042.5	441	0.52	2.38	0.94	2	119.0	47.00	0.179
3060	439	1.87	9.49	0.46	4.5	210.8	10.22	0.164
3114	422	1.33	10.02	0.33	17.8	56.29	1.853	0.117
3132	444	8.82	50.26	1.81	15.7	320.1	11.52	0.149
3139	447	.3	1.08	1.59	1	108.0	159.0	0.217
3139	447	0.3	1.08	1.59	1	108.0	159.0	0.217
3150	440	0.52	5.72	0.71	2.9	197.2	24.48	0.083
3168	444	4.44	29.75	0.9	9	330.5	10.00	0.129
3169	447	0.24	0.63	1.65	0.96	65.62	171.8	0.275
3204	447	19.75	172.65	4.33	54.2	318.5	7.988	0.102
3204	447	18.91	151.63	2.6	47	322.6	5.531	0.110
3222	444	10.7	78.83	2.32	22.8	345.7	10.17	0.119
3240	446	5.25	59.09	2.22	21	281.3	10.57	0.081
3258	442	8.72	65.68	2.35	22.7	289.3	10.35	0.117
3276	442	11.69	66.46	1.49	18.4	361.1	8.097	0.149
3294	442	5.88	39.55	2.05	13.4	295.1	15.29	0.129
3312	443	3.07	19.73	0.74	7.15	275.9	10.34	0.134
3366	442	11.3	68.4	2.6	23.1	296.1	11.25	0.141
3384	434	10.31	29.95	1.82	8.35	358.6	21.79	0.256
3402	446	2.15	11.69	0.74	5.3	220.5	13.96	0.155
3420	446	8.86	54.67	1.61	17.4	314.1	9.252	0.139
3438	442	0.64	2.87	0.52	1.56	183.9	33.33	0.182
3474	445	1.79	9.36	0.64	4.3	217.6	14.88	0.160
3492	443	1.98	11.37	0.51	4.55	249.8	11.20	0.148

3510	452	1.38	10	0.84	5.9	169.4	14.23	0.121
3528	448	0.9	4.66	0.69	3.42	136.2	20.17	0.161
3546	452	0.31	1.82	0.88	2.1	86.66	41.90	0.145
3564	456	2.5	12.04	0.9	7.1	169.5	12.67	0.171
3618	457	0.86	4.12	0.6	3.82	107.8	15.70	0.172
3636	458	1.39	6.73	1.3	5.4	124.6	24.07	0.171
3653	455	0.37	0.6	2.17	1.09	55.04	199.0	0.381
3690	443	0.98	5.82	3.16	5.05	115.2	62.57	0.144
3708	460	2.56	14.92	3	10	149.2	30.00	0.146
3710	461	0.57	1.06	1.14	1.48	71.62	77.02	0.349
3741.3	458	0.33	0.69	2.42	0.96	71.87	252.0	0.323
3778	465	0.62	2.03	1.7	2.1	96.66	80.95	0.233
3778.1	465	.63	2.03	1.7	2.1	96.66	80.95	0.236
3798	465	1.8	7.28	1.41	5.75	126.6	24.52	0.198
3846	468	3.08	23.95	1.39	13.7	174.8	10.14	0.113
3875	520	0.43	1.07	1.76	1.23	86.99	143.0	0.286



3907	458	0.45	0.68	0.82	1.08	62.96	75.92	0.398
3941	438	0.25	0.47	0.85	0.61	77.04	139.3	0.347
3955	476	2.25	16.12	2.34	13.2	122.1	17.72	0.122
3976.5	461	0.44	1.06	1.57	1.92	55.20	81.77	0.293
4057	434	0.31	0.44	1.37	0.82	53.65	167.0	0.413
4085	476	0.28	0.62	0.91	1.34	46.26	67.91	0.311
4086	461	0.52	3.32	1.11	3.64	91.20	30.49	0.135
4106.5	483	0.33	0.65	1.36	1.46	44.52	93.15	0.336
4130	490	0.24	0.7	2.2	1.74	40.22	126.4	0.255
4140	456	0.34	2.1	0.95	3.42	61.40	27.77	0.139
4216	418	0.81	0.7	2.51	1.4	50.00	179.2	0.536
4230	442	0.91	3.81	1.68	4.8	79.37	35.00	0.192
4247	491	0.26	0.99	7.48	2.45	40.40	305.3	0.208

Model Units

Depth	= (m)
Distance	= (m)
Thermal Conductivity	= (W/m*deg C)
Heat Capacity	= (kJ/m^3*deg C)
Heat Flow	= (mW/m^2)
Temperature	= (deg C)
Gradient	= (deg F/100 ft)
Activation Energy	= (kcal/mole)
Frequency Factor	= (1/my)
HC Density	= (g/cm^3)
Seismic Velocity	= (m/s)
Event Time	= (msec)
Maturity	= (%Ro)
HC Generation	= (mg/g TOC)

Calculation Options

Compaction	= Sclater & Christie
Porosity Depth Method	= Linear
Permeability Calculation	= Modified Kozeny-Carman

```
Geothermal Calculation = Steady-State Heat Flow
             Use BHT's = Off
   Maturity Calculation = LLNL
  Expulsion Calculation = None
          Time Interval = 1.00
        Depth Interval = 1000.00
      Integrate Depth = No

Advanced Options
     TTI Reference Temp = 105.00
      TTI Doubling Temp = 10.00
   Rock-Eval Correction = 35.00
           Thermal Gain = 1.000
   Kinetics Calculation = Quick
Critical Fracturing Fraction = 0.850
  Fracture Closure Rate = 0.050
Conductivity Calculation = Deming/Chapman
           Initial S1 = 3.00

Rifting HF Options
  Use Rifting Heat Flow = No
        Start Rift Time = 0.00
```



```
          End Rift Time = 0.00
         Auto-Calc Beta = No
Rifting Heat Flow Beta = 2.00

Present Day Info
              Model Name = Pelican 5
     Model Description =
   Current Surface Temp = 10.00
     Current Elevation = -77.40
     Current Heat Flow = 60.00

Well Data
               Latitude = 0.00000000
              Longitude = 0.00000000
                      X = 0.00000000
                      Y = 0.00000000
           Symbol Code = 0.0
         KB Elevation = 0.00
            Well Name = Pelican 5
  Abbreviated Well Name = Pel5
            Unique Id = ACMBASS

Seismic Parameters
            Shot Point = 0
                      X = 0.00000000
                      Y = 0.00000000
```



BasinMod Data Report
Licensed to: Sagasco Resources Limited
Version: 4.00
Model Name: PELICAN TROUGH
File Name: PELDEEP.MOD
Date: Jul 25, 1994
Time: 11:55 am

Stratigraphy Table

Formation or Event Name	Type	Begin Age (Ma)	Well Top (m)	Present Thick (m)	Missing Thick (m)
f	F	9.5	77.4	922.6	
Late Miocene Unc	E	10			-50
Deposition 1	D	10.5			+50
Torquay Gp b	F	21	1000	410	
Olig-Mio Unc	E	23			-400
Deposition 2	D	35			+400
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Deposition 3	D	48			+100
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Deposition 4	D	52			+300
PELICAN ZONE	F	55	2450	660	
Palaeocene	F	64	3110	400	
Palaeo-Cret Unc	E	65			-50
Deposition 5	D	66			+50
Cretaceous	F	77	3510	735	
unpntrd section	F	95	4245	2000	

Formation or Event Name	Type	Lithology	Kerogen Name	TOC %	Lith Color
f	F	TORQ C			
Late Miocene Unc	E				
Deposition 1	D	TORQ AB			
Torquay Gp b	F	TORQ AB			
Olig-Mio Unc	E				
Deposition 2	D	TORQ AB			
Torquay Gp (A)	F	TORQ AB			
Demons Bluff Fm	F	DB			
Upper EVCM (B)	F	EVB	003070	15	
Base N.asp Unc	E				
Deposition 3	D	EVA			
Upper EVCM (A)	F	EVA	003070	15	
Mid M.diversus U	E				
Deposition 4	D	PEL			
PELICAN ZONE	F	PEL	003070	10	
Palaeocene	F	PALAEO	002080	8	

Palaeo-Cret Unc	E			
Deposition 5	D	CRET		
Cretaceous	F	CRET	001585	7Yellow
unpntrd section	F	CRET	001585	7

Formation or Event Name	Type
f	F
Late Miocene Unc	E
Deposition 1	D
Torquay Gp b	F
Olig-Mio Unc	E
Deposition 2	D
Torquay Gp (A)	F
Demons Bluff Fm	F
Upper EVCM (B)	F
Base N.asp Unc	E
Deposition 3	D
Upper EVCM (A)	F
Mid M.diversus U	E
Deposition 4	D
PELICAN ZONE	F
Palaeocene	F
Palaeo-Cret Unc	E
Deposition 5	D
Cretaceous	F
unpntrd section	F

Lithology Mixes Table

Lithology Name	Lithology Pattern	% Sandstone	% Siltstone	% Shale	% Limestone
Sandstone	1	100.0			
Siltstone	2		100.0		
Shale	3			100.0	
Limestone	4				100.0
Dolomite	5				
Evaporite	6				
Coal	7				
Igneous	0				
TORQ C					100
TORQ AB				90	10
DB		3	46	46	5
EVB		60	13	15	
EVA		70		15	
PEL		44	26	26	
PALAEO		50	13	35	
CRET		25	30	44	

Lithology Name	% Dolomite	% Evaporite	% Kerogen	% Igneous	Total %
Sandstone					100.0
Siltstone					100.0

Shale					100.0
Limestone					100.0
Dolomite	100.0				100.0
Evaporite		100.0			100.0
Coal			100.0		100.0
Igneous				100.0	100.0
TORQ C					100.0
TORQ AB					100.0
DB					100.0
EVB	2		10		100.0
EVA	2		13		100.0
PEL	1		3		100.0
PALAEO			2		100.0
CRET			1		100.0

Lithology Values Table

Lithology Name	Initial Porosity	Compaction Factor (FM)	Exponential Factor (SC)	Density (g/cm^3)	Grain Size (mm)
Sandstone	0.45	1.75	0.27	2.64	0.5
Siltstone	0.55	2.20	0.41	2.64	0.0156
Shale	0.60	2.40	0.51	2.60	0.0004
Limestone	0.60	1.50	0.22	2.72	0.5
Dolomite	0.60	1.50	0.22	2.85	0.5
Evaporite	0.00	0.00	0.00	2.15	0.0004
Coal	0.90	3.50	0.70	1.80	0.0004
Igneous	0.00	0.00	0.00	2.65	0.0001
603208	0.53	2.09	0.38	2.560	0.0288
504010	0.55	2.18	0.40	2.540	0.0141
405505	0.55	2.19	0.42	2.576	0.0069
307000	0.55	2.20	0.43	2.612	0.0033
TORQ C	0.60	1.50	0.22	2.720	0.5000
TORQ AB	0.60	2.31	0.48	2.612	0.0008
DB	0.57	2.24	0.44	2.625	0.0038
EVB	0.53	2.07	0.36	2.554	0.0535
EVA	0.53	2.07	0.36	2.529	0.0678
PEL	0.53	2.08	0.38	2.606	0.0256
PALAEO	0.52	2.07	0.38	2.609	0.0227
CRET	0.55	2.18	0.42	2.614	0.0071

Lithology Name	Matrix Conductivity (W/m*deg C)	Heat Capacity (kJ/m^3*deg C)
Sandstone	4.40	2800.
Siltstone	2.00	2650.
Shale	1.50	2100.
Limestone	2.90	2600.
Dolomite	4.80	2600.
Evaporite	5.40	1750.
Coal	0.30	950.0
Igneous	2.90	2500.
603208	3.144	2428.
504010	2.830	2335.
405505	2.600	2322.
307000	2.370	2310.
TORQ C	2.900	2600.

TORQ AB	2.2	2150.
DB	2.4	2399.
EVB	2.6	2486.
EVA	4.0	2450.
PEL	2.9	2521.
PALAEO	3.5	2498.
CRET	2.7	2428.

Time Values Table

Time (Ma)	Heat Flow (mW/m^2)
.5	62
21	65
47	68
64	66
77	65

Bottom Hole Temperature Table

Depth (m)	Temp (deg C)	Delta Time	Circ. Time	Temp Error
3003.5	95.6			+-20
3649	142.2			+-20
3995	170.6			+-10
4236	178.9			+-10
4248	170.0			+-10
4255	177.8			+-10
4267	172.8	8.5	2	+-10
4267	172.9	11.5		+-10
4267	175.6	16.8		+-10

Geothermal Gradient Table

Time (Ma)	Depth 1 (m)
0	0

Maturity conversion method: Table
TTI = 4.191876 + 1.817512 * log10(Ro)
Data fit: Least Squares

Measured Ro Table

Depth (m)	Ro	Ro Error
1851	.367	.034
1999.4	.565	.043
2169	.523	.037
2322	.539	.034
2593	.662	.049
2745	.77	.076
2790	.727	.089
2937	.693	.122
2961	.823	.066

3123	.882	.049
3357	.961	.085
3474	.991	.065
3627	1.114	.096
3710	1.269	.129
3717	1.233	.094
3789	1.265	.075
3907	1.522	.148
3933	1.418	.077
4032	1.431	.11
4085	1.59	.158
4104	1.403	.096
4185	1.412	.084
4247	1.672	.151

Measured Pyrolysis Table

Depth (m)	TMAX	S1 (mg/g)	S2 (mg/g)	S3 (mg/g)	TOC %	HI	OI	PI
2298.5	429	12.04	233.06	2.24	68.8	338.7	3.255	0.049
2451	428	1.02	16.18	.44	4.7	344.2	9.361	0.059
3139	447	.3	1.08	1.59	1	108.0	159.0	0.217
3204	447	19.75	172.65	4.33	54.2	318.5	7.988	0.102
3778.1	465	.63	2.03	1.7	2.1	96.66	80.95	0.236
3955	476	2.25	16.12	2.34	13.2	122.1	17.72	0.122

Model Units

Depth	= (m)
Distance	= (m)
Thermal Conductivity	= (W/m*deg C)
Heat Capacity	= (kJ/m^3*deg C)
Heat Flow	= (mW/m^2)
Temperature	= (deg C)
Gradient	= (deg F/100 ft)
Activation Energy	= (kcal/mole)
Frequency Factor	= (1/my)
HC Density	= (g/cm^3)
Seismic Velocity	= (m/s)
Event Time	= (msec)
Maturity	= (%Ro)
HC Generation	= (mg/g TOC)

Calculation Options

Compaction	= Sclater & Christie
Porosity Depth Method	= Linear
Permeability Calculation	= Modified Kozeny-Carman
Geothermal Calculation	= Steady-State Heat Flow
Use BHT's	= Off
Maturity Calculation	= LLNL
Expulsion Calculation	= None
Time Interval	= 1.00
Depth Interval	= 1000.00
Integrate Depth	= No

Advanced Options

TTI Reference Temp	= 105.00

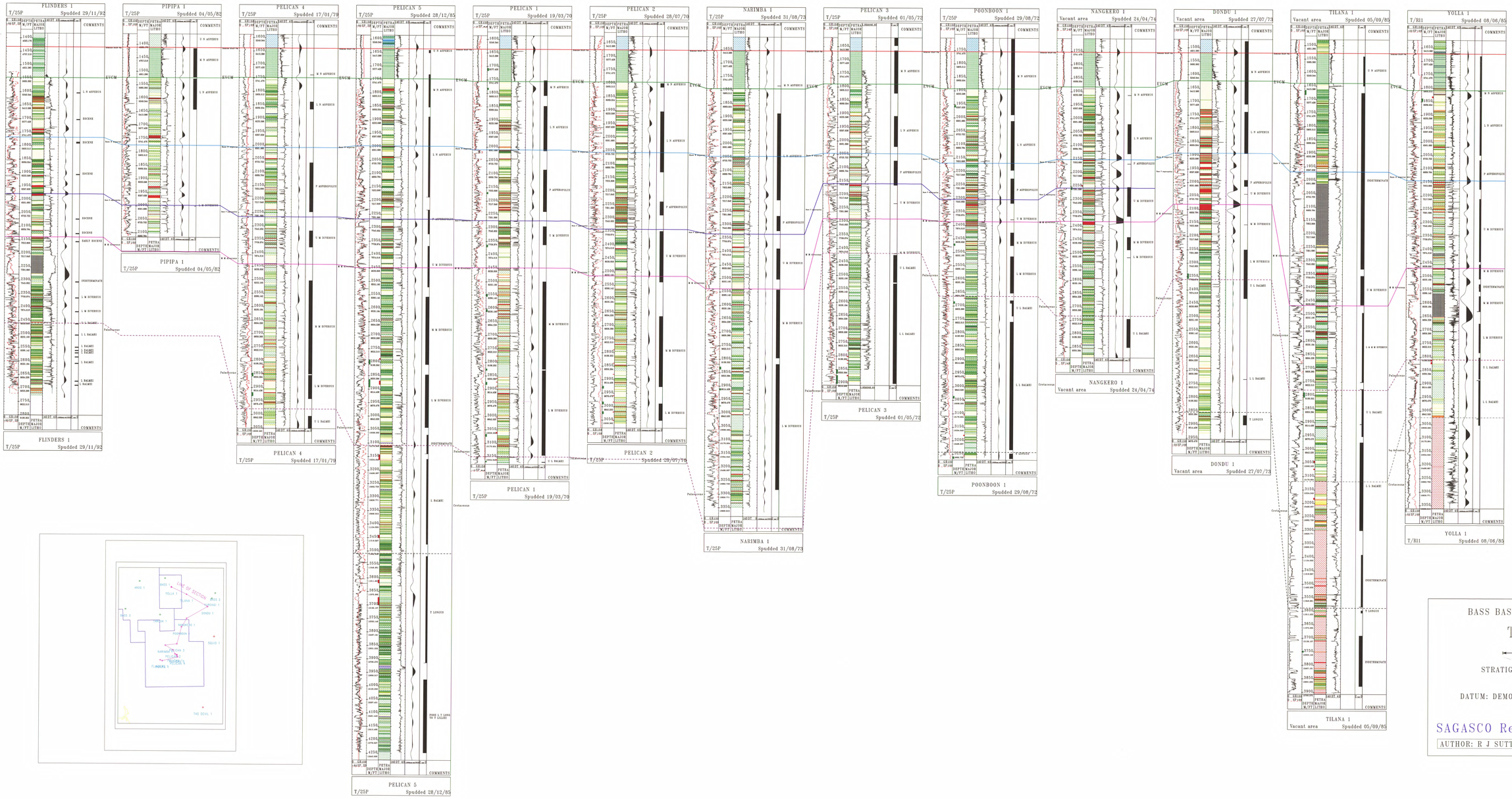
TTI Doubling Temp = 10.00
Rock-Eval Correction = 35.00
Thermal Gain = 1.000
Kinetics Calculation = Quick
Critical Fracturing Fraction = 0.850
Fracture Closure Rate = 0.050
Conductivity Calculation = Deming/Chapman
Initial S1 = 3.00

Rifting HF Options
Use Rifting Heat Flow = No
Start Rift Time = 0.00
End Rift Time = 0.00
Auto-Calc Beta = No
Rifting Heat Flow Beta = 2.00

Present Day Info
Model Name = PELICAN TROUGH
Model Description =
Current Surface Temp = 10.00
Current Elevation = -77.40
Current Heat Flow = 60.00

Well Data
Latitude = 0.00000000
Longitude = 0.00000000
X = 0.00000000
Y = 0.00000000
Symbol Code = 0.0
KB Elevation = 0.00
Well Name = PELICAN DEEP
Abbreviated Well Name = PELDEEP
Unique Id = ACMBASS

Seismic Parameters
Shot Point = 0
X = 0.00000000
Y = 0.00000000



BASS BASIN - TASMANIA

T/25P

STRATIGRAPHIC SECTION

DATUM: DEMONS BLUFF FORMATION

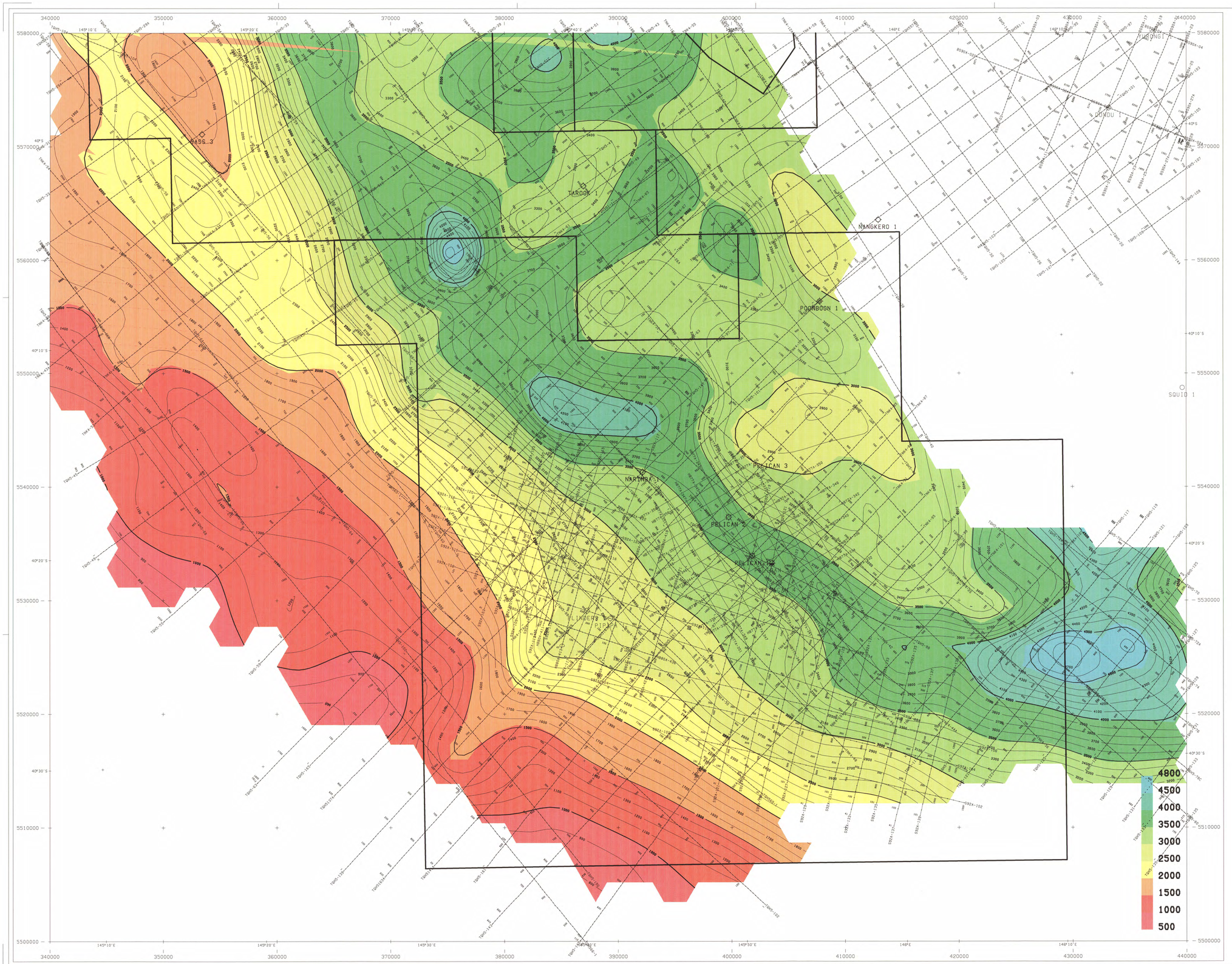
SAGASCO Resources Limited

AUTHOR: R J SUTTILL | DATE: NOVEMBER 1993

ENCLOSURE 1

CR 0333 VOL II

491509



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BASS BASIN

Basement
Smoothed Time Structure Map (ms twt)

N

PROSPECT : t25p

INTERFACE : 200 1
BASE MAP, WELLS AND CULTURE
TIME CONTOUR MAP

PROJECTION:	UTM SOUTH
SPHEROID:	AUSTRALIAN NATIONAL
CENTRAL MERIDIAN:	147D 0M 0.000S
SCALE REDUCTION FACTOR:	0.9996000
(LAT,LON) SYSTEM:	SEXAGESIMAL
X-Y UNIT:	METER

5 cm

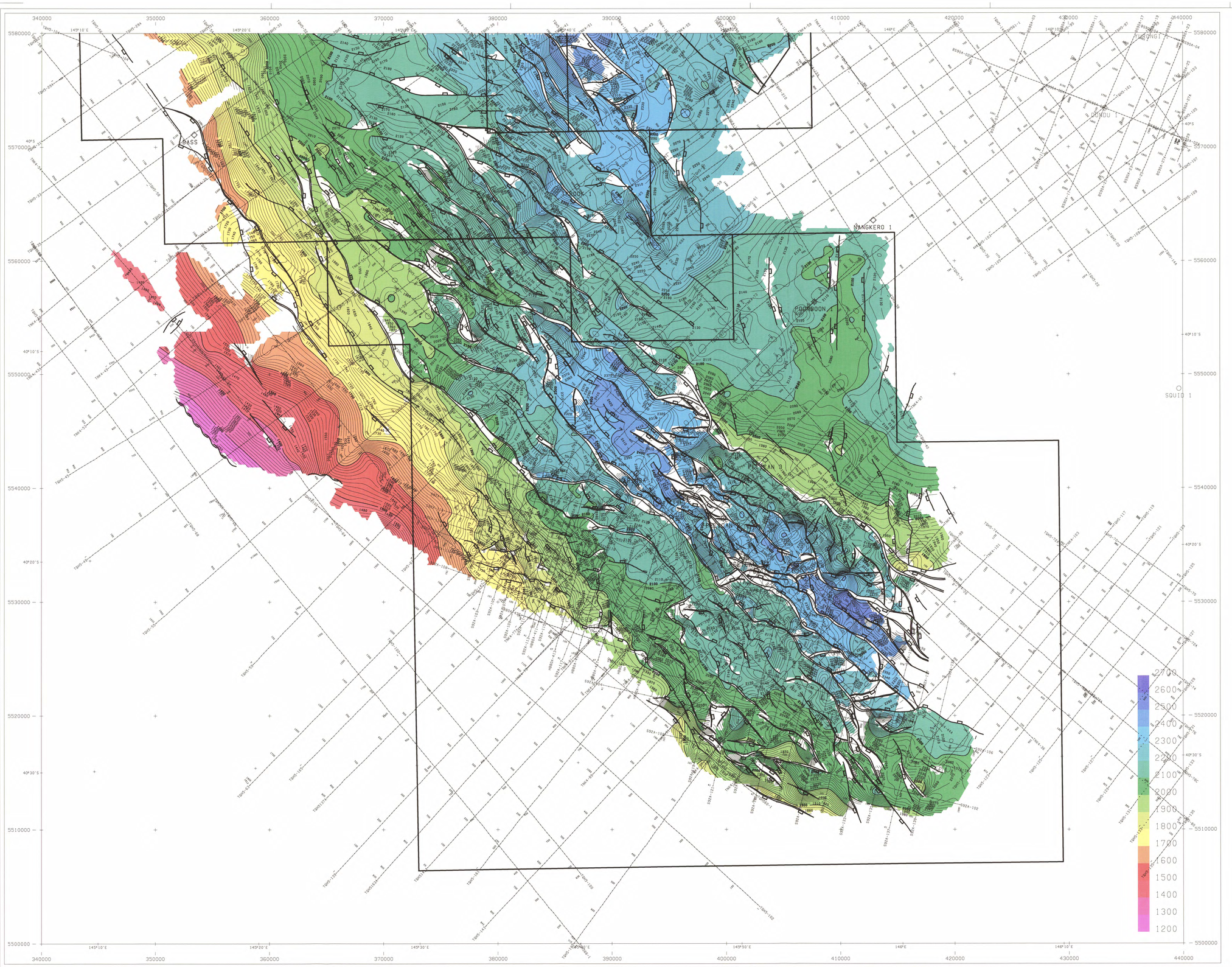
0 5000 10000 15000 m

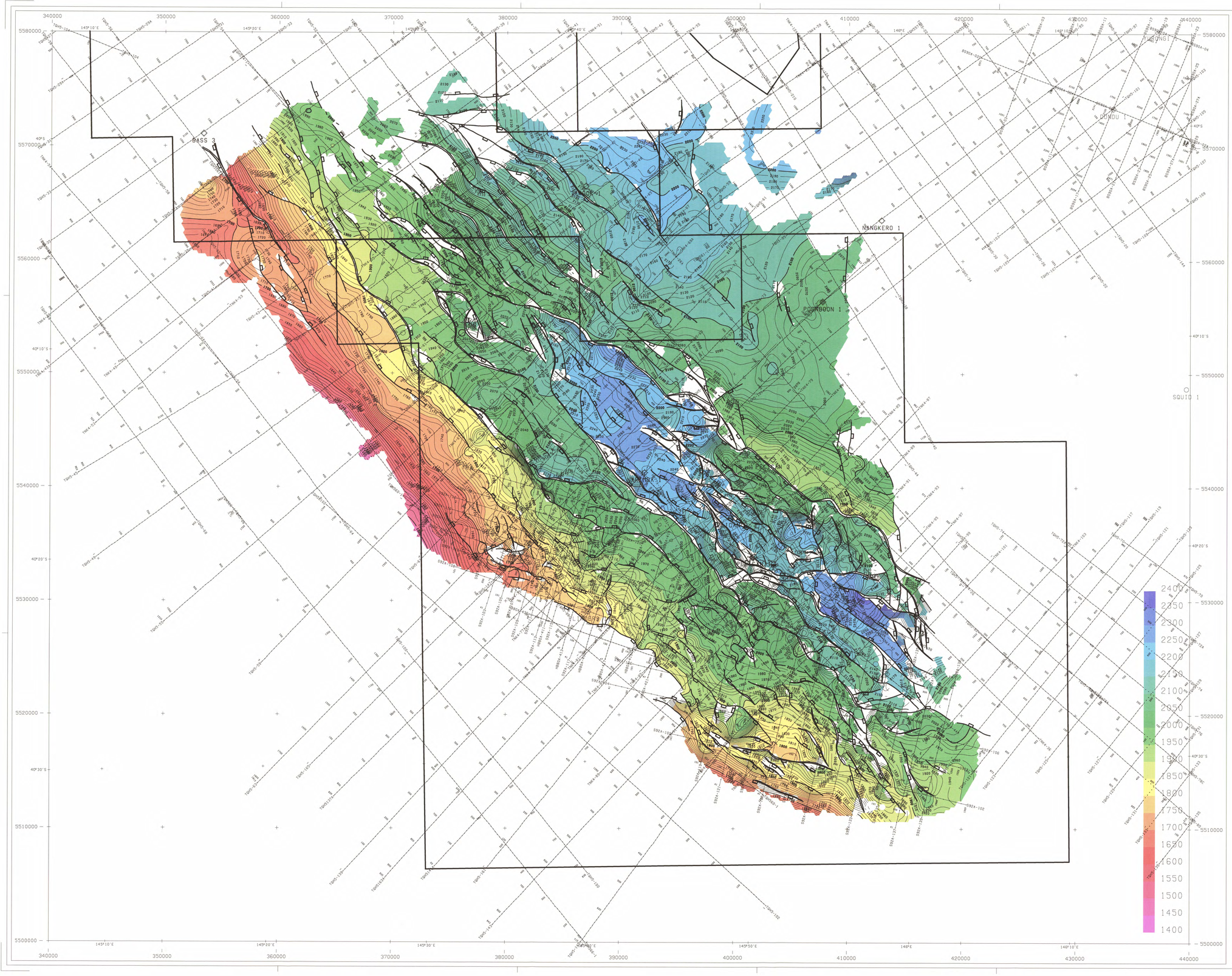
SCALE : 1 : 100000
DATE : 22-JUL-94, 10:14:31

ENCLOSURE 9.
OR-0382 VOL II

481510

djk t25p-200.hpgl


BASS
FLOUNDER 1
NANGKERO 1
POONBOON 1
SQUID 1
DOMOU
LONG 1
POSEIDON 3
POSEIDON 4
POSEIDON 5
POSEIDON 6
POSEIDON 7
POSEIDON 8
POSEIDON 9
POSEIDON 10
POSEIDON 11
POSEIDON 12
POSEIDON 13
POSEIDON 14
POSEIDON 15
POSEIDON 16
POSEIDON 17
POSEIDON 18
POSEIDON 19
POSEIDON 20
POSEIDON 21
POSEIDON 22
POSEIDON



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BASS BASIN

Top Lower Madiversus

N

PROSPECT : t25p

INTERFACE : 165 1

BASE MAP, WELLS AND CULTURE

TIME CONTOUR MAP, FAULTS

PROJECTION:	UTM SOUTH
SPHEROID:	AUSTRALIAN NATIONAL
CENTRAL MERIDIAN;	147D 0M 0.0000S
SCALE REDUCTION FACTOR:	0.9996000
(LAT.,LON.) SYSTEM:	SEXAGESIMAL
X-Y UNIT:	METER

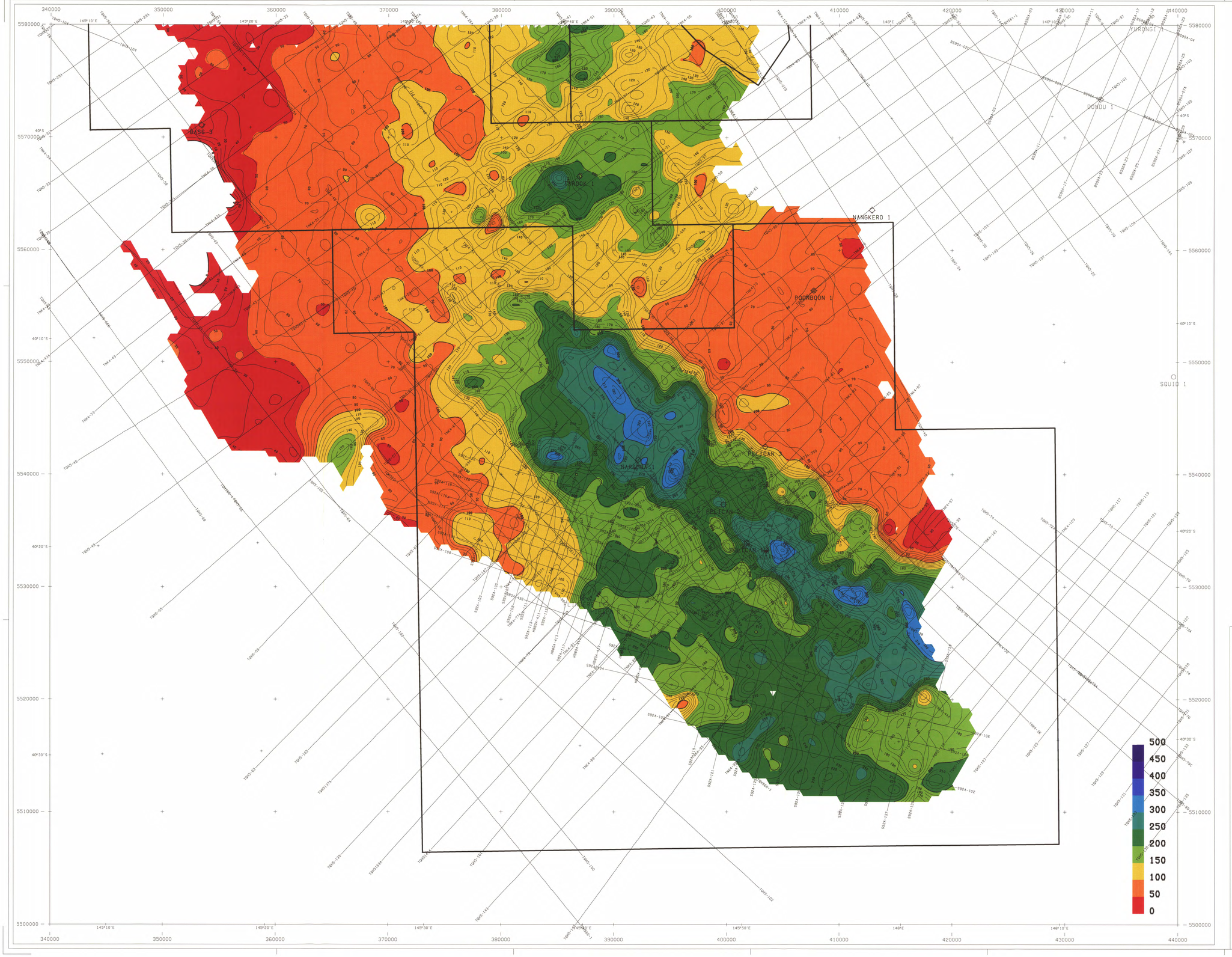
5 cm

0 5000 10000 15000 m

SCALE : 1 : 100000

DATE : 21-JUL-94, 15:18:45

ENCLOSURE 4.
OR-0382 VOL II



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BASS BASIN

Isochron of Lower Maldiversus
(approximately)

N

PROSPECT : t25p

INTERFACE : 6070 2

BASE MAP, WELLS AND CULTURE

TIME CONTOUR MAP

PROJECTION:	UTM SOUTH
SPHEROID:	AUSTRALIAN NATIONAL
CENTRAL MERIDIAN:	147° 0m 0.000S
SCALE REDUCTION FACTOR:	0.9996000
(LAT.,LON.) SYSTEM:	SEXAGESIMAL
X-Y UNIT:	METER

5 cm

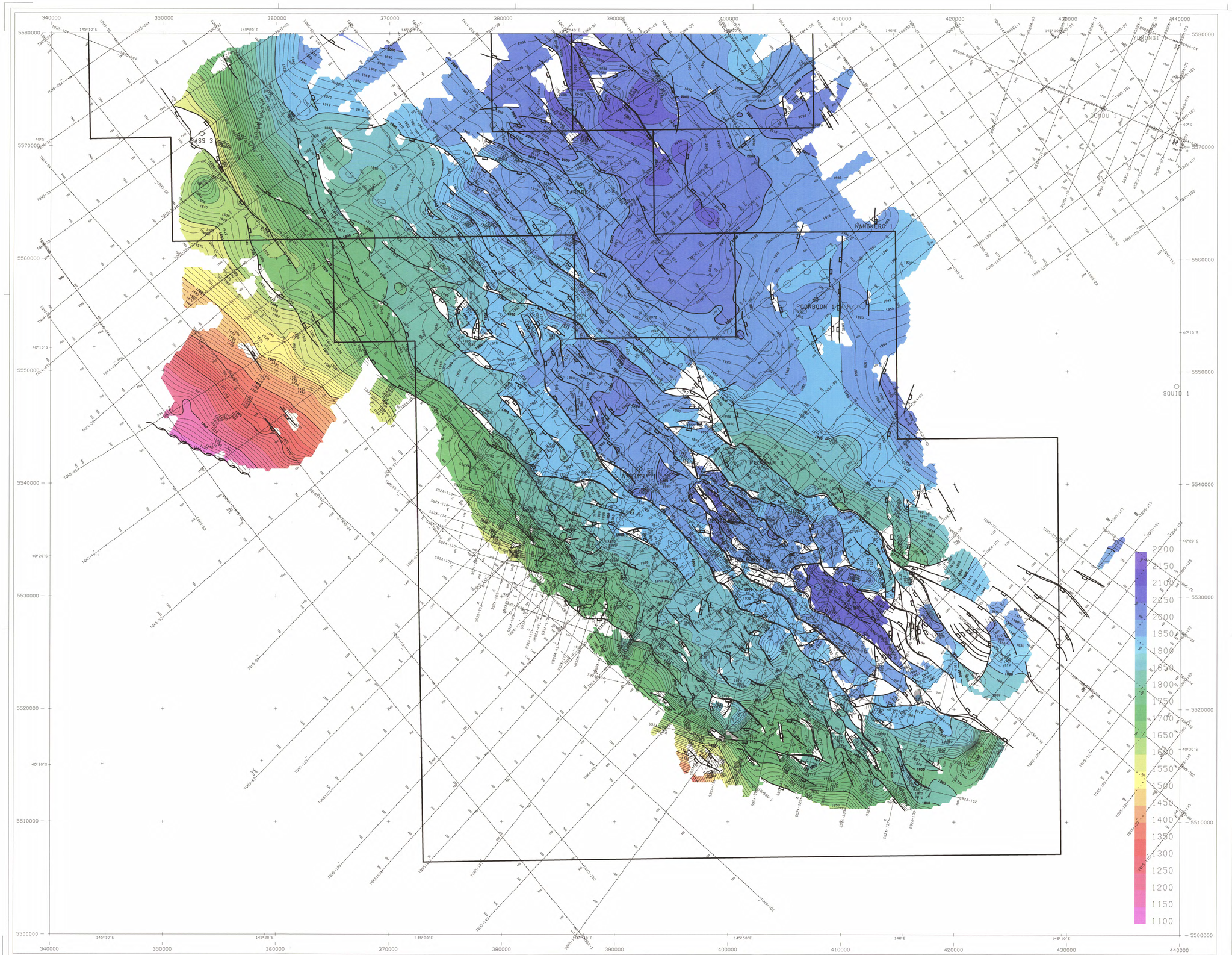
491513

0 5000 10000 15000 m

SCALE : 1 : 100000

DATE : 21-JUL-94, 11:08:51

ENCLOSURE 5.
OR. 0382 VOL II



SAGASCO Resources Ltd

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BASS BASIN

Top Middle Madiversus
Time Structure (ms TWT)

N

PROSPECT : t25p

INTERFACE : 155 1

BASE MAP, WELLS AND CULTURE

TIME CONTOUR MAP, FAULTS

PROJECTION:	UTM SOUTH
SPHEROID:	AUSTRALIAN NATIONAL
CENTRAL MERIDIAN;	147D 0M 0.0000S
SCALE REDUCTION FACTOR:	0.9996000
(LAT.,LON.) SYSTEM:	SEXAGESIMAL
X-Y UNIT:	METER

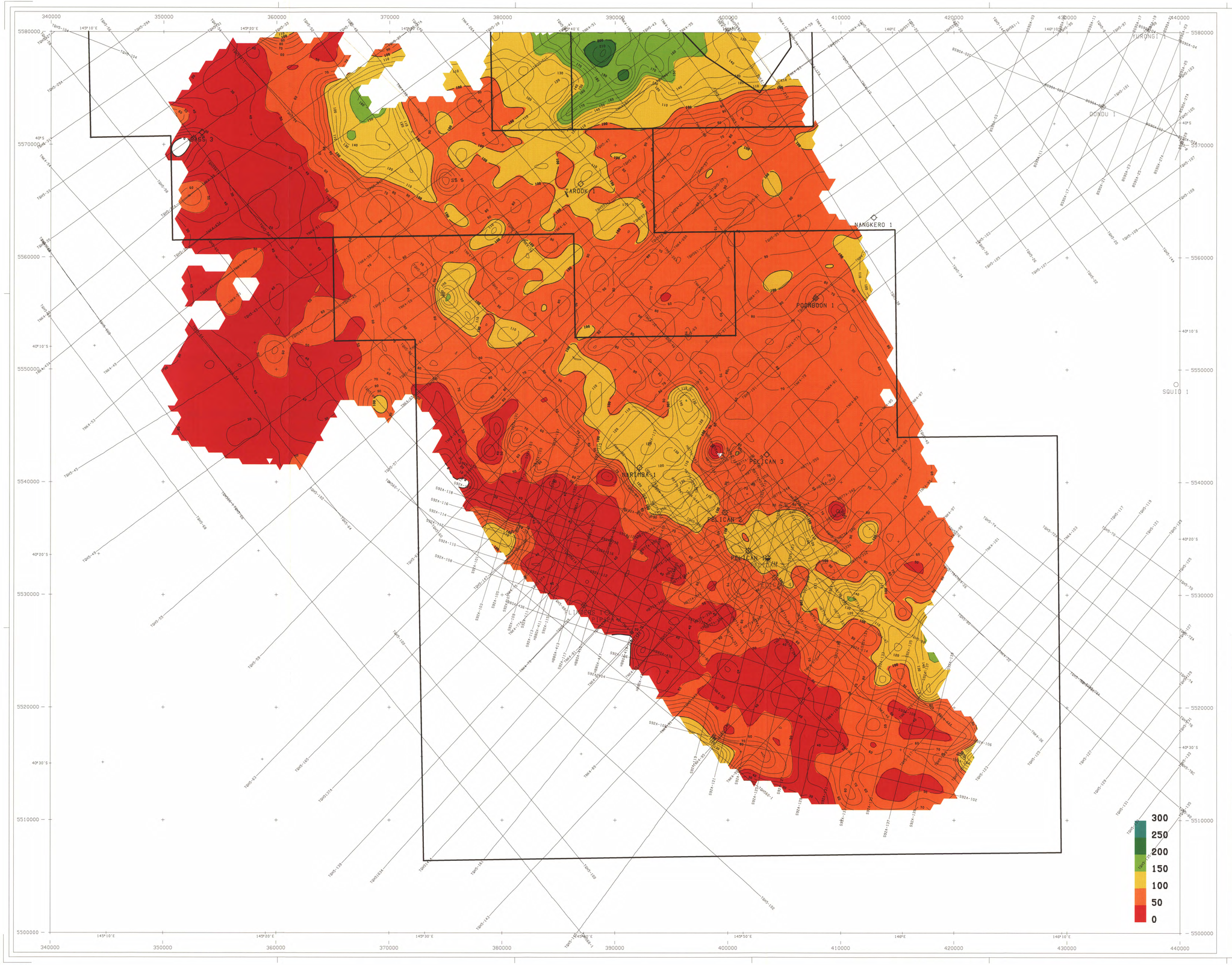
5 cm

0 5000 10000 15000 m

SCALE : 1 : 100000

DATE : 21-JUL-94, 14:30:50

ENCLOSURE 6.
CR. 0383 VOL. II



SAGASCO Resources Ltd

SAGASCO RESOURCES LTD

BASS BASIN

Isochron of Middle Mediversus
(approximately)

N

491515

PROSPECT : t25p

INTERFACE : 5560 2
BASE MAP, WELLS AND CULTURE
TIME CONTOUR MAP

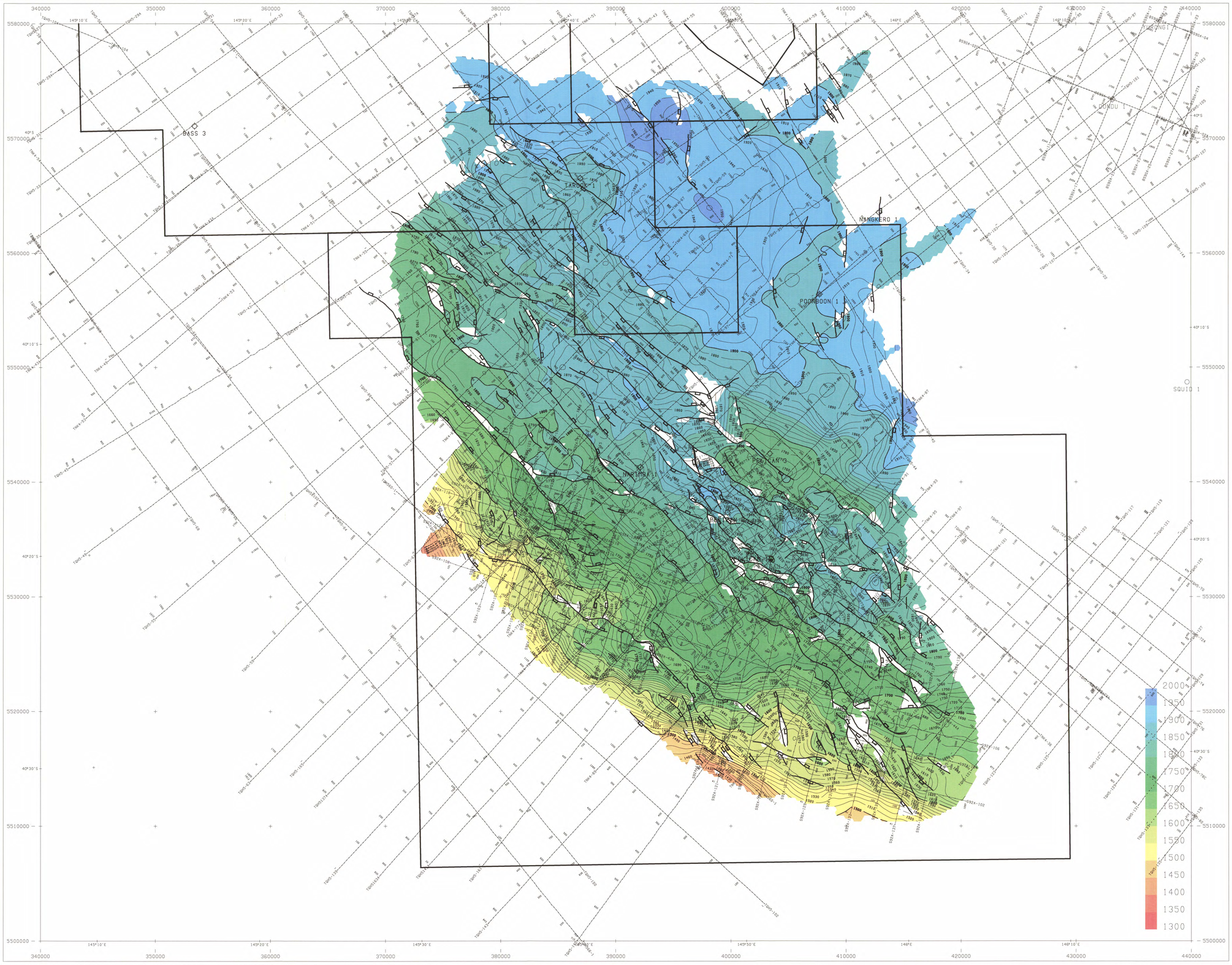
PROJECTION:	UTM SOUTH
SPHEROID:	AUSTRALIAN NATIONAL
CENTRAL MERIDIAN:	147D 0M 0.000S
SCALE REDUCTION FACTOR:	0.9996000
(LAT,+LON) SYSTEM:	SEXAGESIMAL
X-Y UNIT:	METER

5 cm

0 5000 10000 15000 m

SCALE : 1 : 100000
DATE : 21-JUL-94, 10:43:21

ENCLOSURE 7.
OR.0363 VOL II



SAGASCO Resources Ltd

SAGASCO RESOURCES LTD

BASS BASIN

Top Upper Madiversus
Time Structure (ms TWT)

N

PROSPECT : t25p

INTERFACE : 145 1
BASE MAP, WELLS AND CULTURE
TIME CONTOUR MAP, FAULTS

PROJECTION:	UTM SOUTH
SPHEROID:	AUSTRALIAN NATIONAL
CENTRAL MERIDIAN:	147D 0M 0.0000S
SCALE REDUCTION FACTOR:	0.9996000
(LAT,LONG) SYSTEM:	SEXAGESIMAL
X-Y UNIT:	METER

5 cm

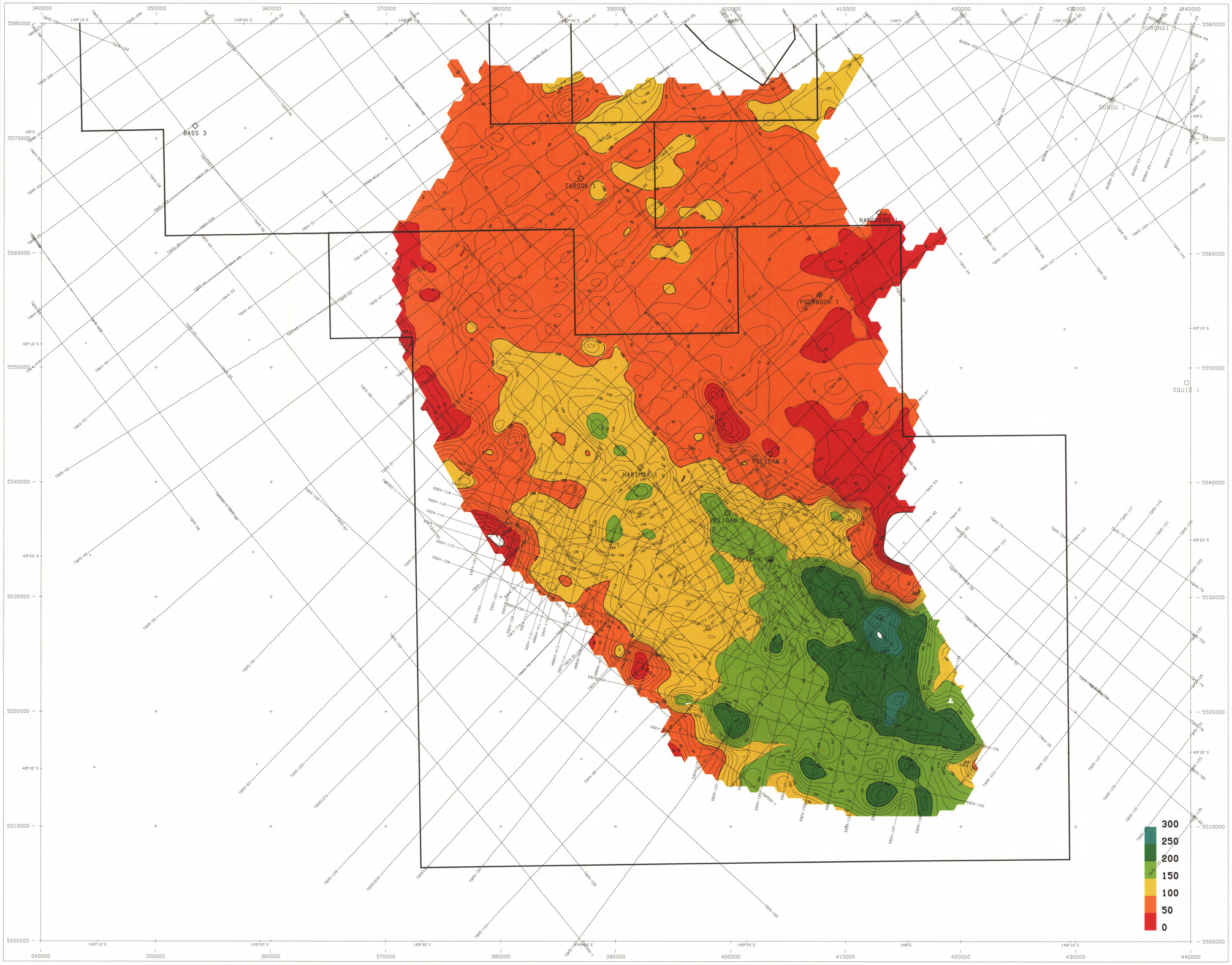
491516

0 5000 10000 15000 m

SCALE : 1 : 100000

DATE : 21-JUL-94, 14:05:34

ENCLOSURE 8
OR-0382 VOL II



SAGASCO Resources Ltd

SAGASCO RESOURCES LTD

BASS BASIN

Isochron of Upper M.diversus
(approximately)

N

PROSPECT : t25p

INTERFACE : 4555 2

BASE MAP, WELLS AND CULTURE

TIME CONTOUR MAP

PROJECTION:	UTM SOUTH
SPHEROID:	AUSTRALIAN NATIONAL
CENTRAL MERIDIAN:	147D 0M 0.000S
SCALE REDUCTION FACTOR:	0.9996000
(LAT.,LON.) SYSTEM:	SEXAGESIMAL
X-Y UNIT:	METER

491517

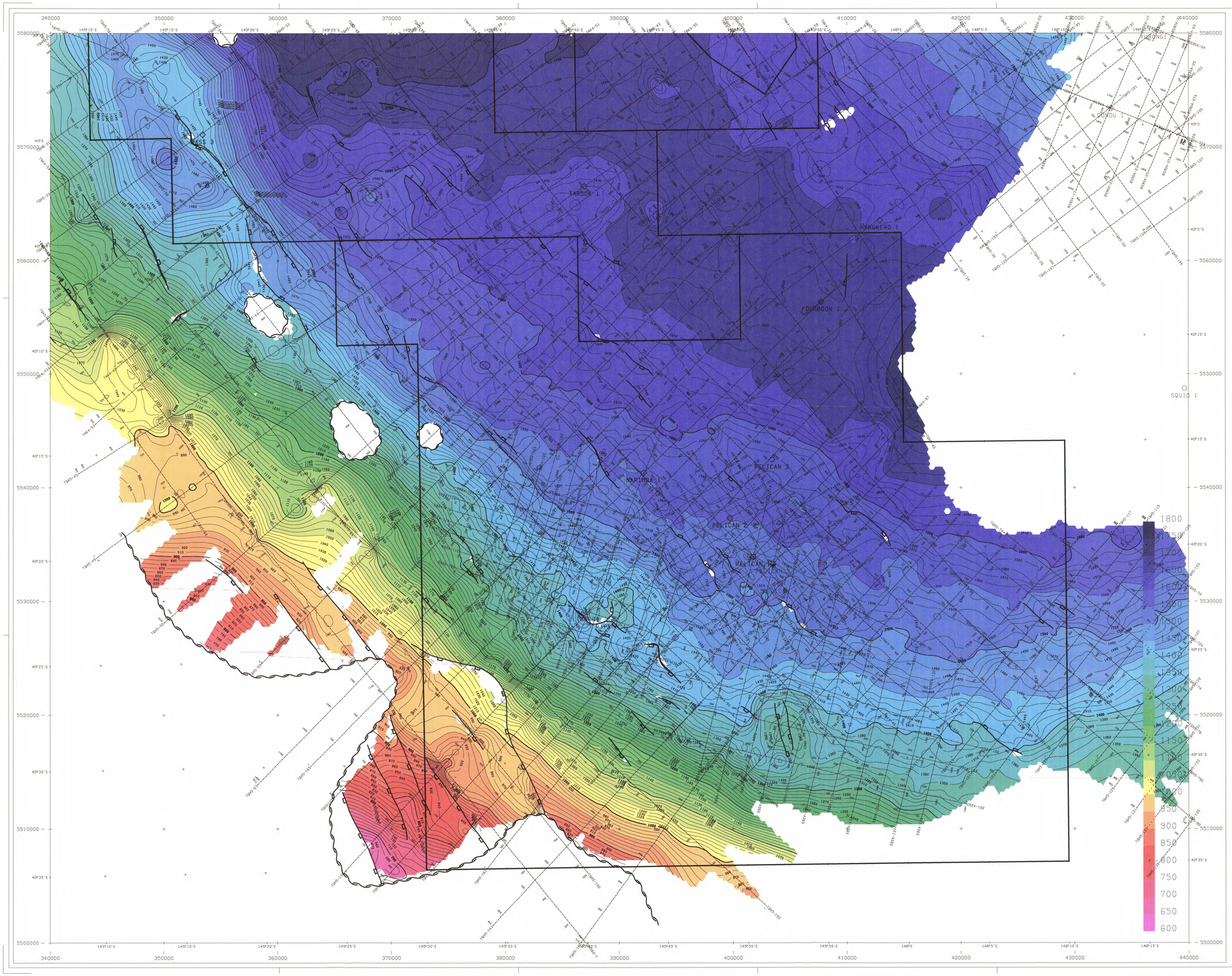
5 cm

0 5000 10000 15000 m

SCALE : 1 : 100000

DATE : 21-JUL-94, 10:35:24

ENCLOSURE 9.
OR. 0358 VOL II



SAGASCO Resources Ltd

SAGASCO RESOURCES LTD

BASS BASIN

Top EVCM

N

491518

PROSPECT : t25p

INTERFACE : t10 1

BASE MAP, WELLS AND CULTURE

TIME CONTOUR MAP, FAULTS

PROJECTION:	UTM SOUTH
SPHEROID:	AUSTRALIAN NATIONAL
CENTRAL MERIDIAN;	147D 0M 0.000S
SCALE REDUCTION FACTOR:	0.9996000
(LAT.,LON.) SYSTEM;	SEXAGESIMAL
X-Y UNIT:	METER

0 5000 10000 15000 m (5 cm)

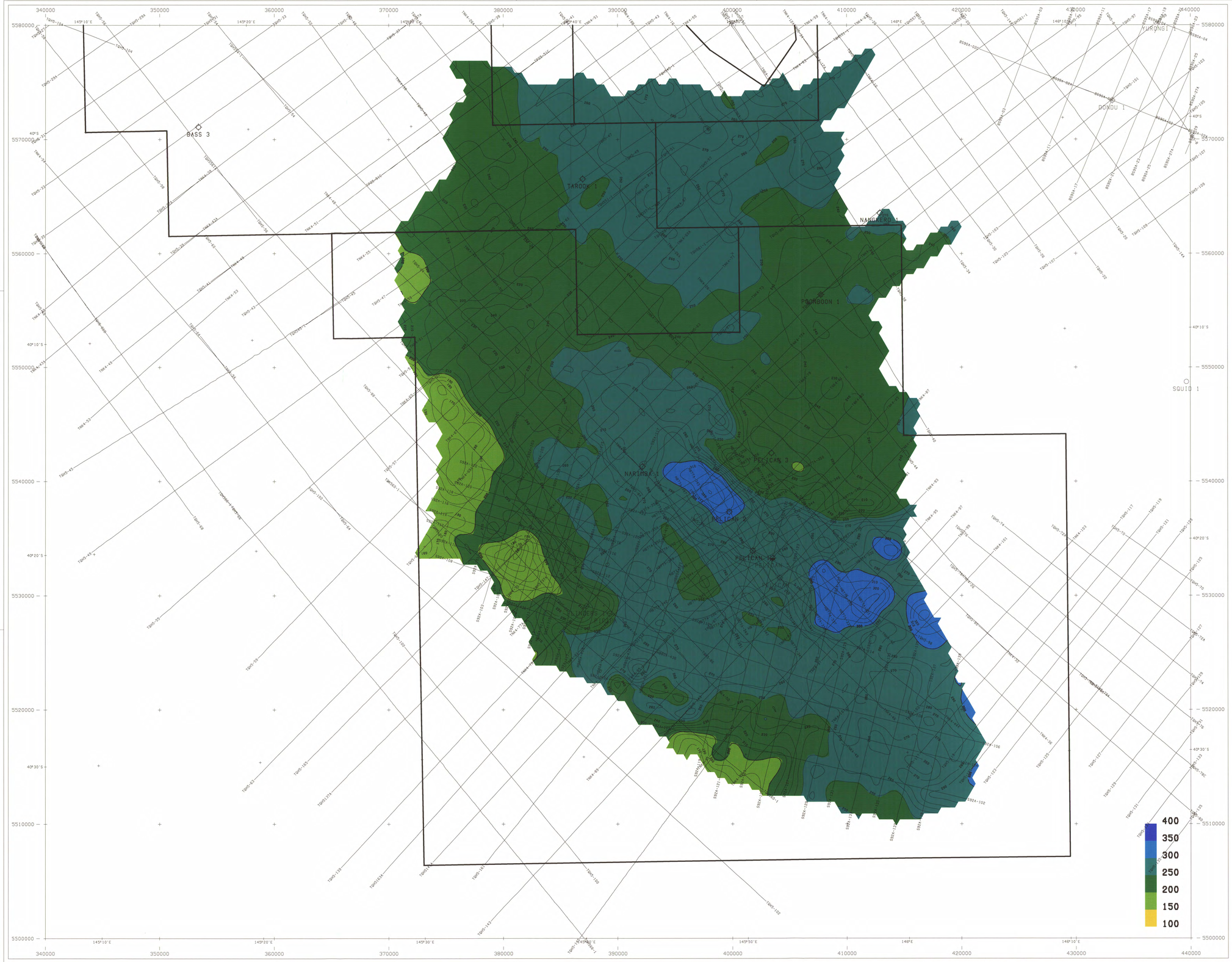
SCALE : 1 : 100000

DATE : 11-MAY-94, 15:03:44

ENCLOSURE 10.
OR 0393 VOL II

t25p-110.hpgl

djk



SAGASCO Resources Ltd

SAGASCO RESOURCES LTD

BASS BASIN

Isochron of post-Madiversus EVCM (approximately)

N

PROSPECT : t25p

491519

INTERFACE : 1045 2

BASE MAP, WELLS AND CULTURE

TIME CONTOUR MAP

PROJECTION:	UTM SOUTH
SPHEROID:	AUSTRALIAN NATIONAL
CENTRAL MERIDIAN:	147D 0M 0.0000S
SCALE REDUCTION FACTOR:	0.9996000
(LAT,+LON) SYSTEM:	SEXAGESIMAL
X-Y UNIT:	METER

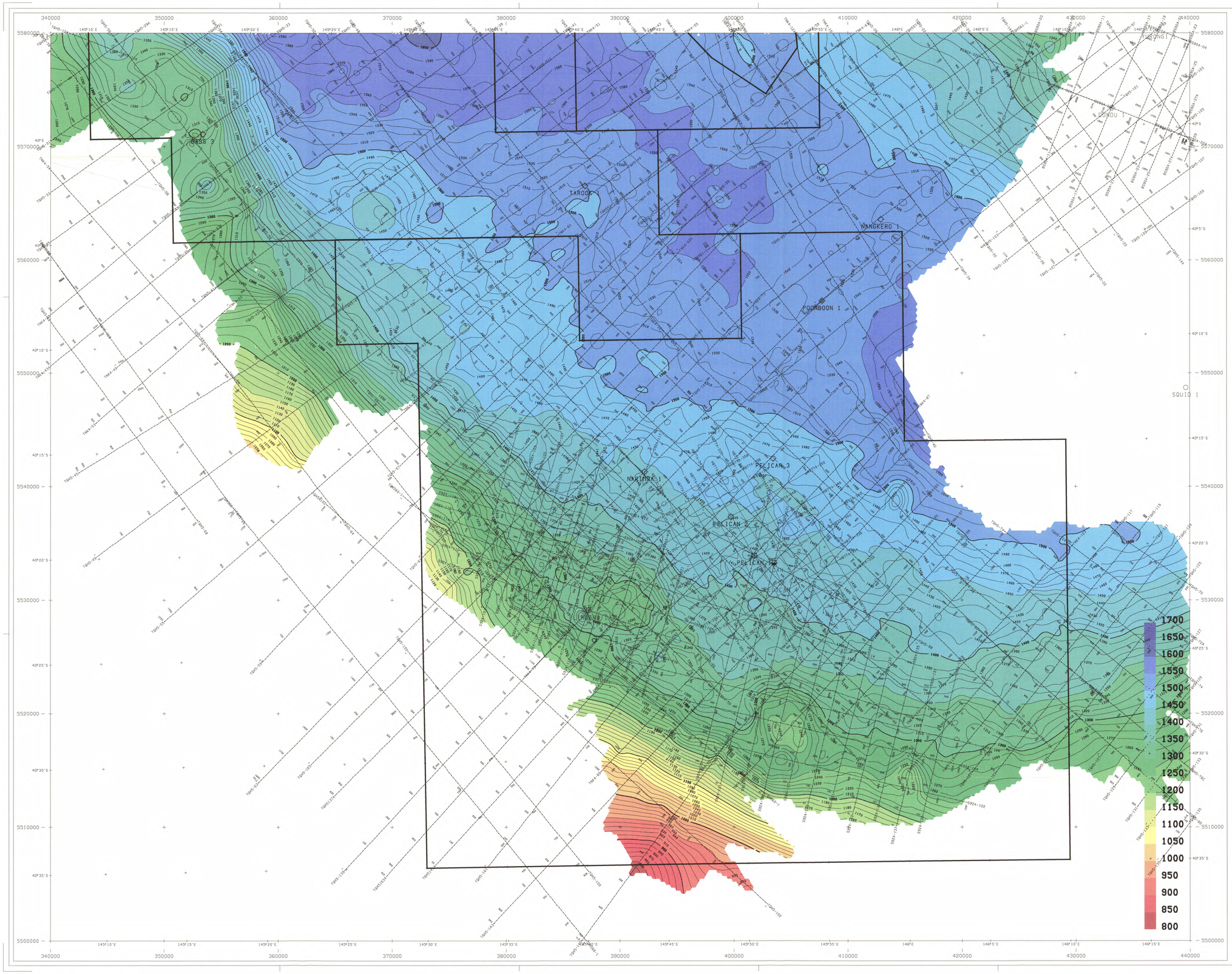
5 cm

0 5000 10000 15000 m

SCALE : 1 : 100000

DATE : 21-JUL-94, 10:22:42

ENCLOSURE 11.
GR. 038-2 VOL II



SAGASCO Resources Ltd

SAGASCO RESOURCES LTD

BASS BASIN

top demon's bluff twt

491520

PROSPECT : t25p

INTERFACE : 109 1

BASE MAP, WELLS AND CULTURE

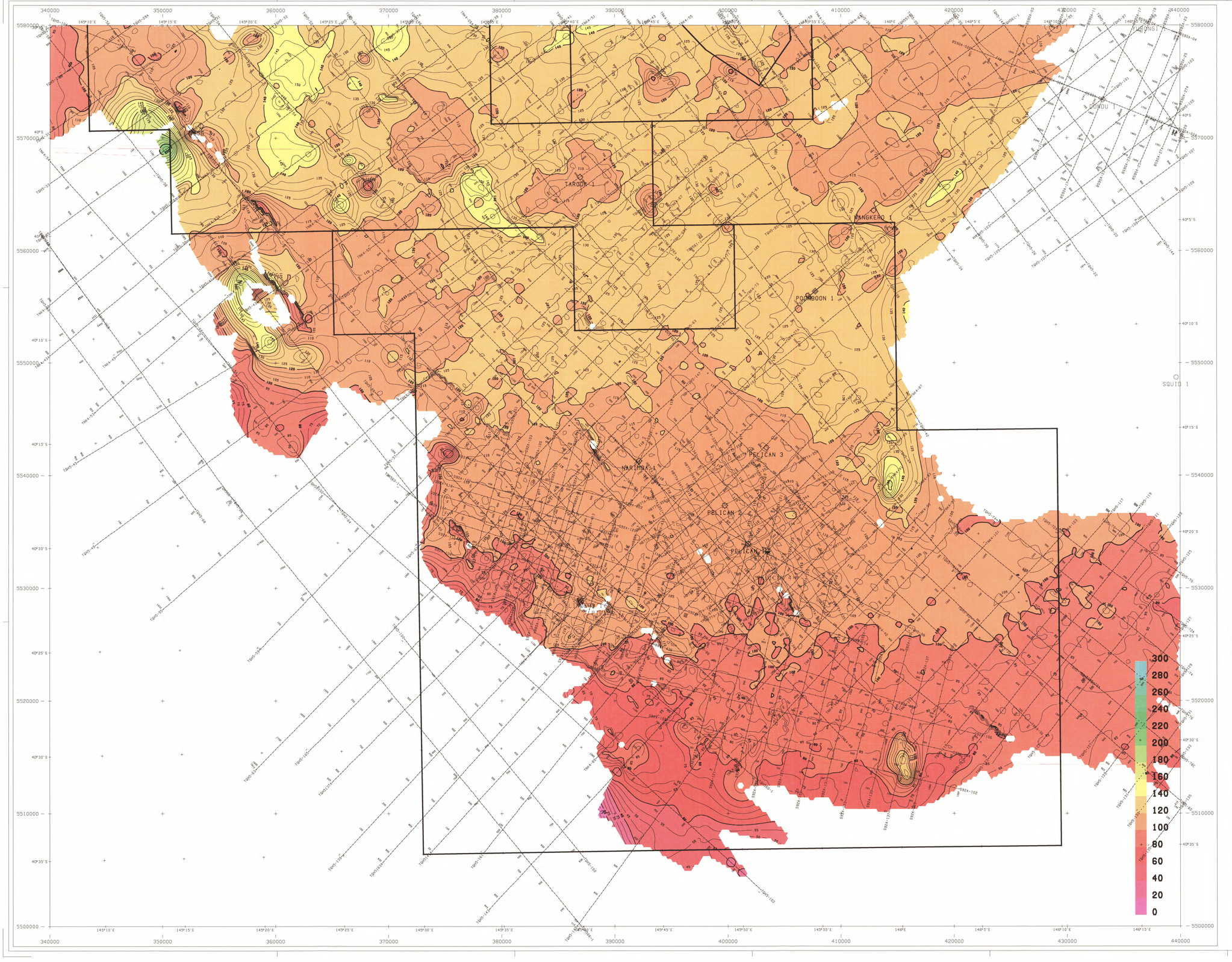
TIME CONTOUR MAP

PROJECTION:	UTM SOUTH
SPHEROID:	AUSTRALIAN NATIONAL
CENTRAL MERIDIAN;	147D 0M 0.0000S
SCALE REDUCTION FACTOR:	0.9996000
(LAT,LON:) SYSTEM:	SEXAGESIMAL
X-Y UNIT:	METER

SCALE : 1 : 100000

DATE : 09-MAY-94, 13:29:50

ENCLOSURE 14
CR. 0382 VOL II



SAGASCO Resources Ltd

SAGASCO RESOURCES LTD

BASS BASIN

Isochron of Demon's Bluff
(approximately)

N

491521

PROSPECT : t25p

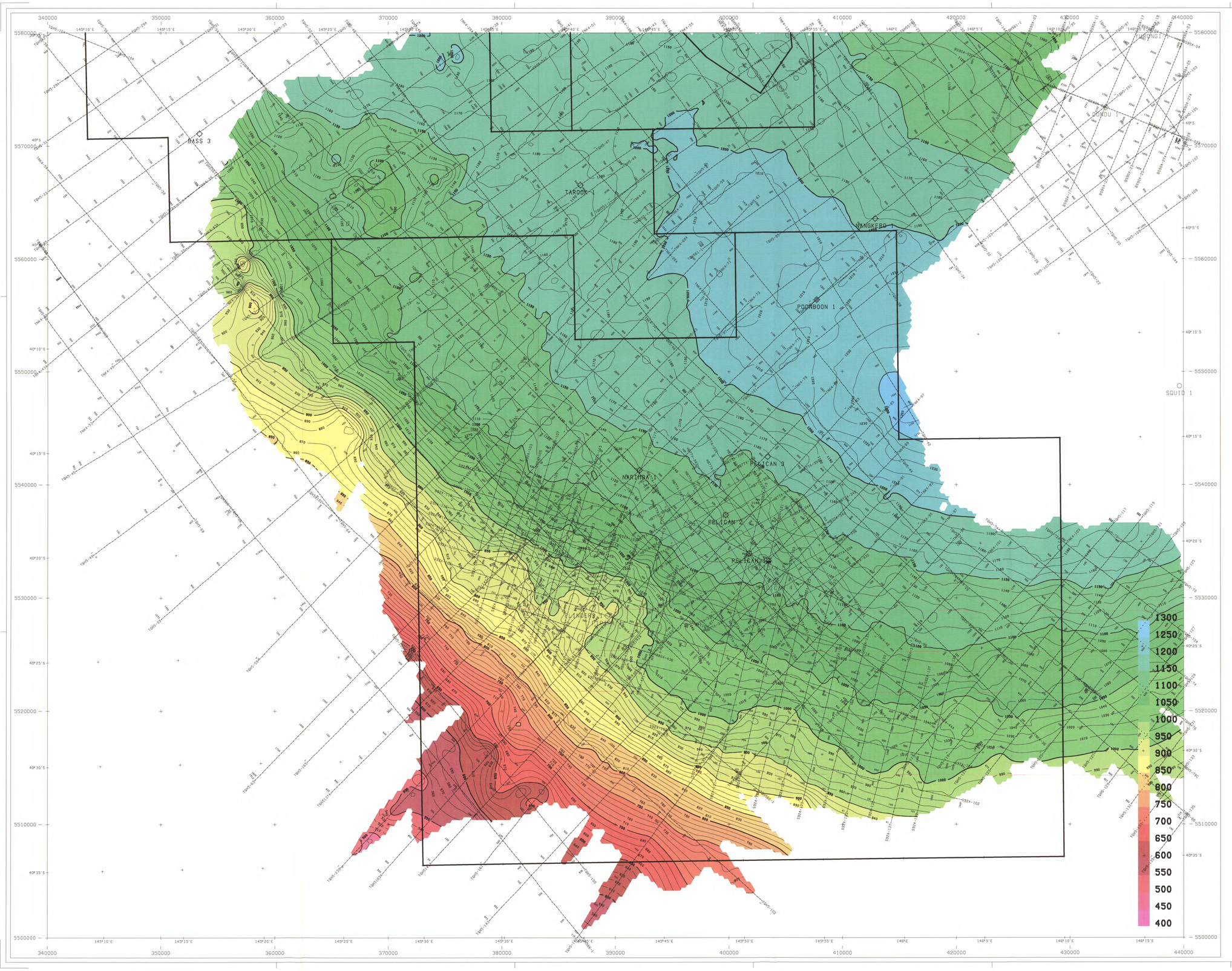
INTERFACE : 910 1
BASE MAP, WELLS AND CULTURE
TIME CONTOUR MAP

PROJECTION:	UTM SOUTH
SPHEROID:	AUSTRALIAN NATIONAL
CENTRAL MERIDIAN:	147D 0M 0.000S
SCALE REDUCTION FACTOR:	0.9996000
(LAT,+LON+) SYSTEM:	SEXAGESIMAL
X-Y UNIT:	METER

5 cm
0 5000 10000 15000 m

SCALE : 1 : 100000
DATE : 10-MAY-94, 15:53:27

ENCLOSURE 13
OR 0380 VOL II



SAGASCO Resources Ltd

SAGASCO RESOURCES LTD

BASS BASIN

Near Top Oligocene

N

491522

PROSPECT : t25p

INTERFACE : 106 1

BASE MAP, WELLS AND CULTURE

TIME CONTOUR MAP

PROJECTION:	UTM SOUTH
SPHEROID:	AUSTRALIAN NATIONAL
CENTRAL MERIDIAN;	147D 0M 0.0000S
SCALE REDUCTION FACTOR:	0.9996000
(LAT,+LON,) SYSTEM:	SEXAGESIMAL
X-Y UNIT:	METER

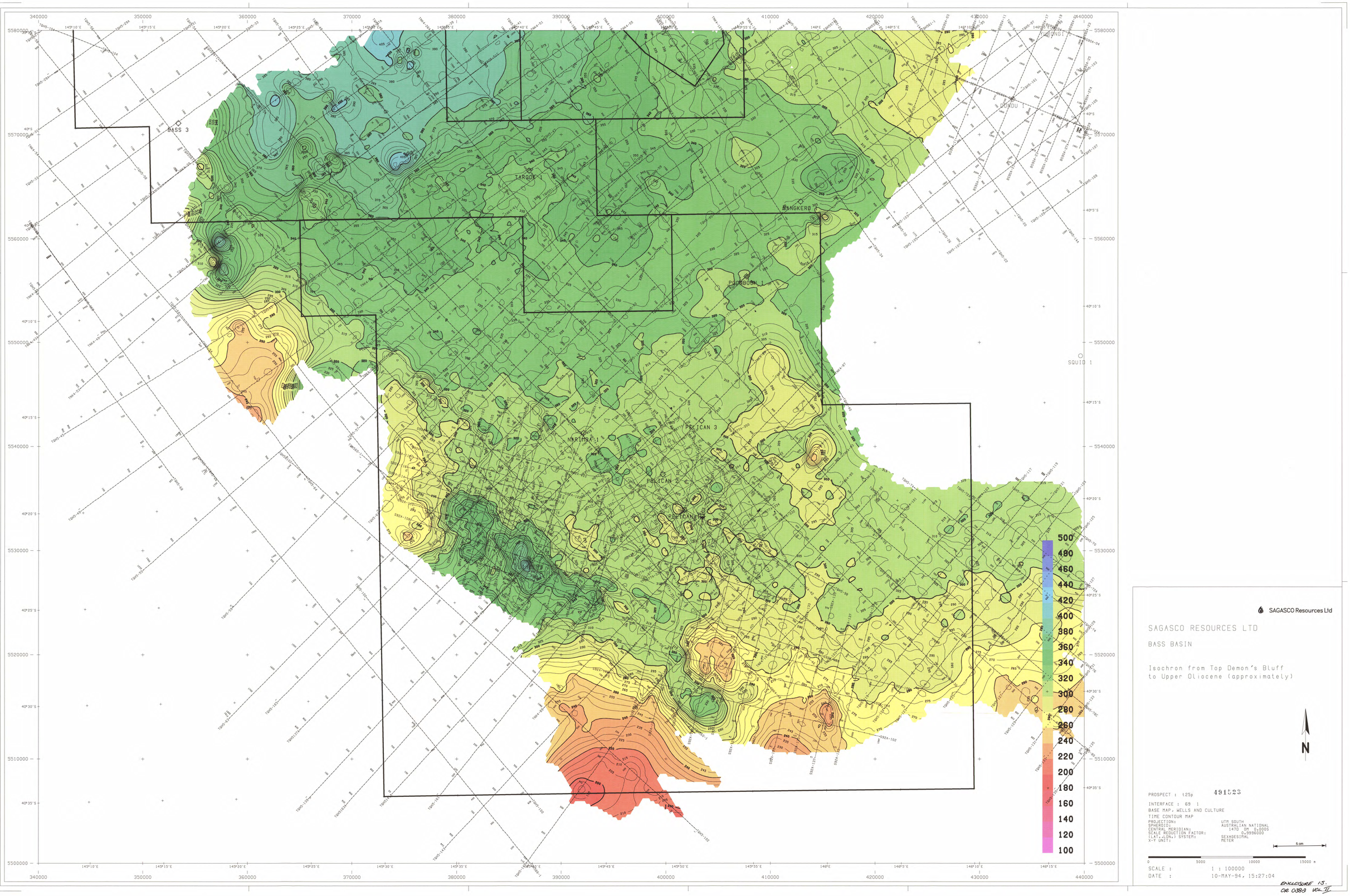
5cm

0 5000 10000 15000 m

SCALE : 1 : 100000

DATE : 05-MAY-94, 09:53:35

ENCLOSURE 14
OR 0382 VOL II



SAGASCO Resources Ltd

SAGASCO RESOURCES LTD

BASS BASIN

Isochron from Top Demon's Bluff
to Upper Oligocene (approximately)

N

PROSPECT : t25p 491523

INTERFACE : 69 1
BASE MAP, WELLS AND CULTURE
TIME CONTOUR MAP

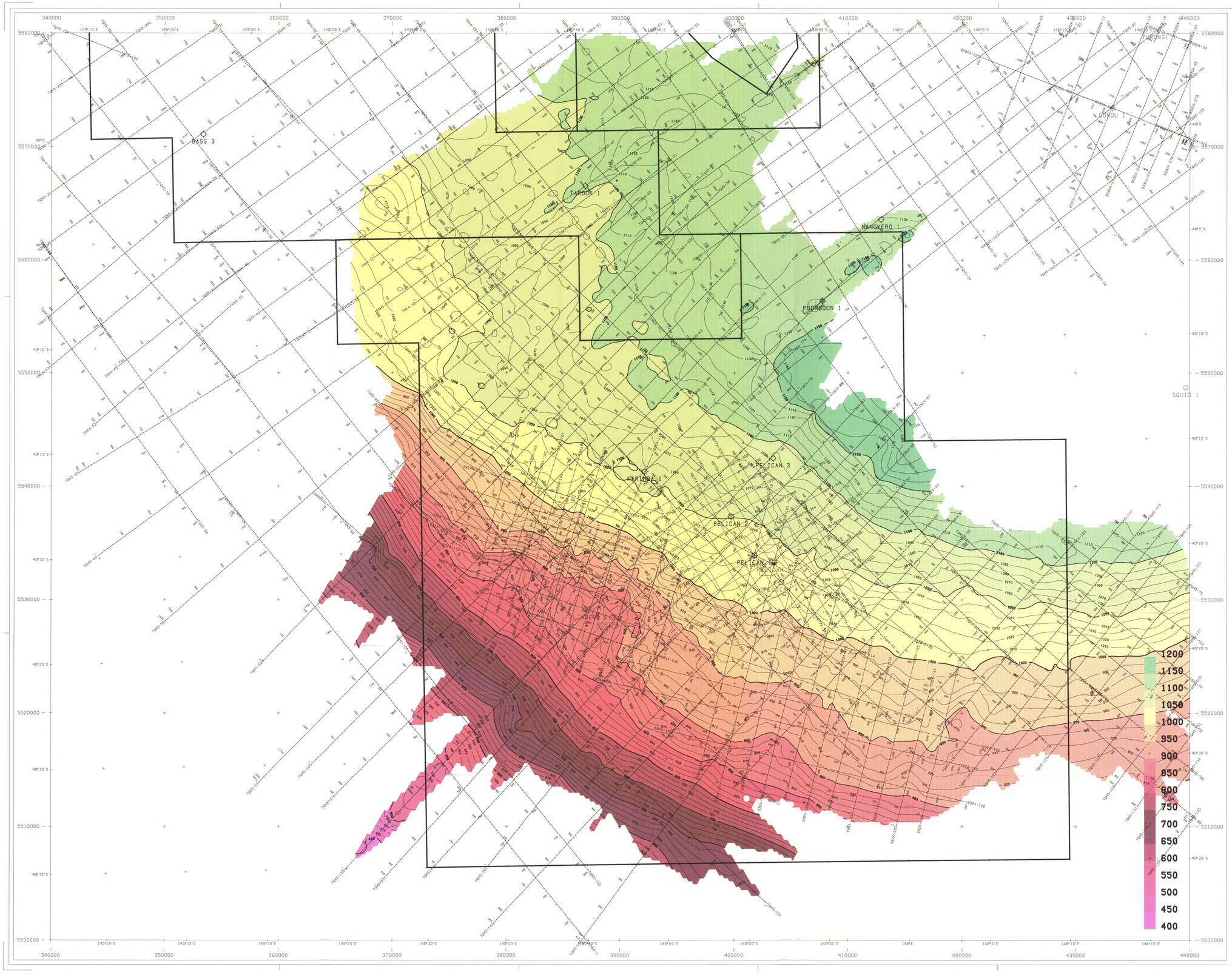
PROJECTION:	UTM SOUTH
SPHEROID:	AUSTRALIAN NATIONAL
CENTRAL MERIDIAN:	147D 0M 0.0000S
SCALE REDUCTION FACTOR:	0.9996000
(LAT.,LON.) SYSTEM:	SEXAGESIMAL
X-Y UNIT:	METER

5 cm

0 5000 10000 15000 m

SCALE : 1 : 100000
DATE : 10-MAY-94, 15:27:04

EXCLOSURE 15.
OR 0389 VOL II



SAGASCO Resources Ltd

SAGASCO RESOURCES LTD

BASS BASIN

Base Miocene Unconformity

N

PROSPECT : t25p

INTERFACE : 105 1

491524

BASE MAP, WELLS AND CULTURE

TIME CONTOUR MAP

PROJECTION:	UTM SOUTH
SPHEROID:	AUSTRALIAN NATIONAL
CENTRAL MERIDIAN:	147D 0M 0.0000S
SCALE REDUCTION FACTOR:	0.9996000
(LAT,+LON+) SYSTEM:	SEXAGESIMAL
X-Y UNIT:	METER

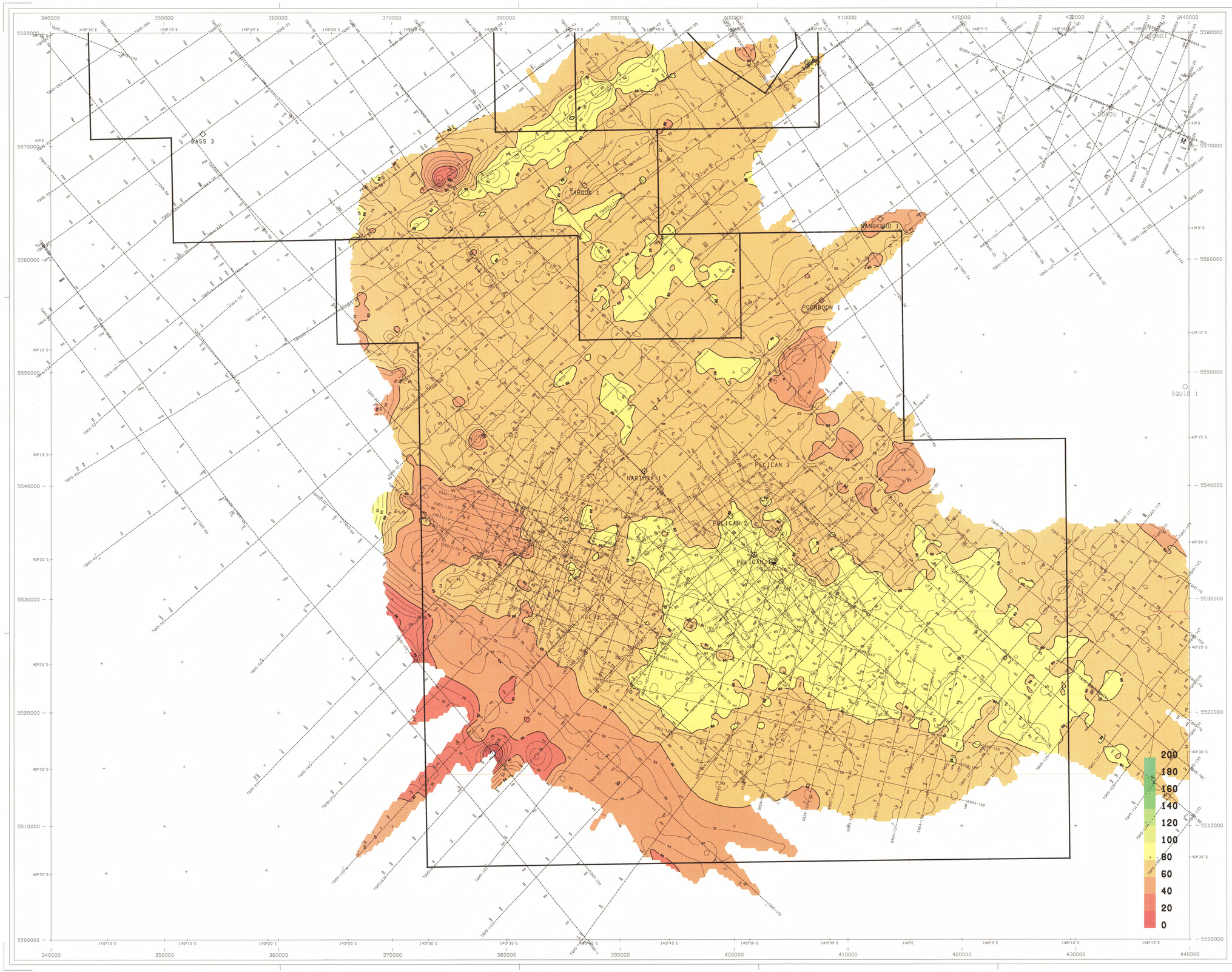
5 cm

0 5000 10000 15000 m

SCALE : 1 : 100000

DATE : 05-MAY-94, 09:36:06

ENCLOSURE 16
OR-0380 VOL III



SAGASCO Resources Ltd

SAGASCO RESOURCES LTD

BASS BASIN

Isochron from Upper Oligocene
to Base Miocene (approximately)

N

PROSPECT : t25p

INTERFACE : 56 1 491525

BASE MAP, WELLS AND CULTURE

TIME CONTOUR MAP

PROJECTION: UTM SOUTH
SPHEROID : AUSTRALIAN NATIONAL
CENTRAL MERIDIAN: 147° 0m 0.0005
SCALE REDUCTION FACTOR: 0.9996000
(LAT.,+LON.) SYSTEM: SEXAGESIMAL
X-Y UNIT: METER

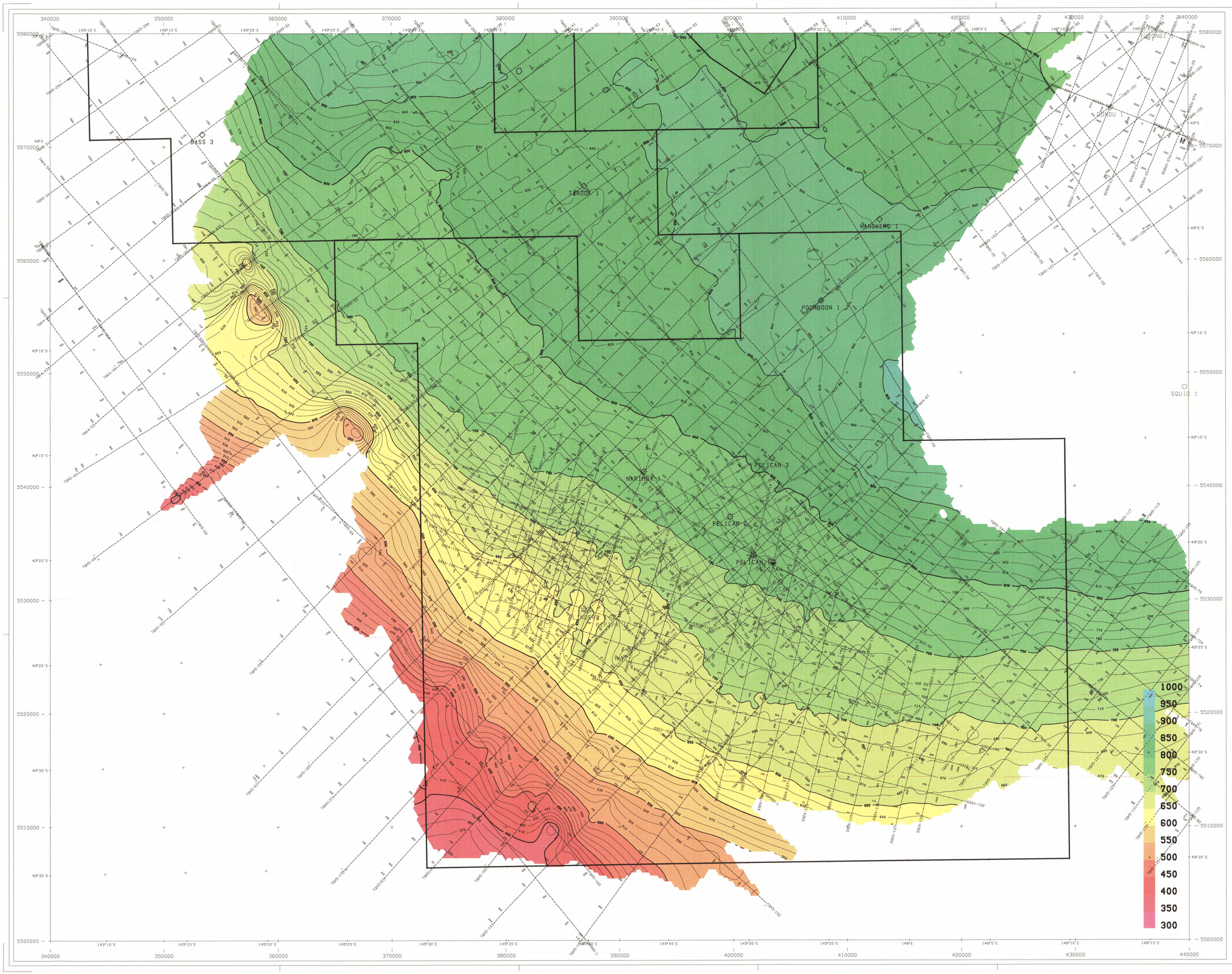
5 cm

0 5000 10000 15000 m

SCALE : 1 : 100000

DATE : 10-MAY-94, 15:05:22

ENCLOSURE 17
OR-0392 VOL III



SAGASCO Resources Ltd

SAGASCO RESOURCES LTD

BASS BASIN

Shallow Miocene Reflector

N

491526

PROSPECT : t25p

INTERFACE : 101 1

BASE MAP, WELLS AND CULTURE

TIME CONTOUR MAP

PROJECTION:	UTM SOUTH
SPHEROID:	AUSTRALIAN NATIONAL
CENTRAL MERIDIAN:	147D 0M 0.000S
SCALE REDUCTION FACTOR:	0.9996000
(LAT.,LON.) SYSTEM:	SEXAGESIMAL
X-Y UNIT:	METER

5 cm

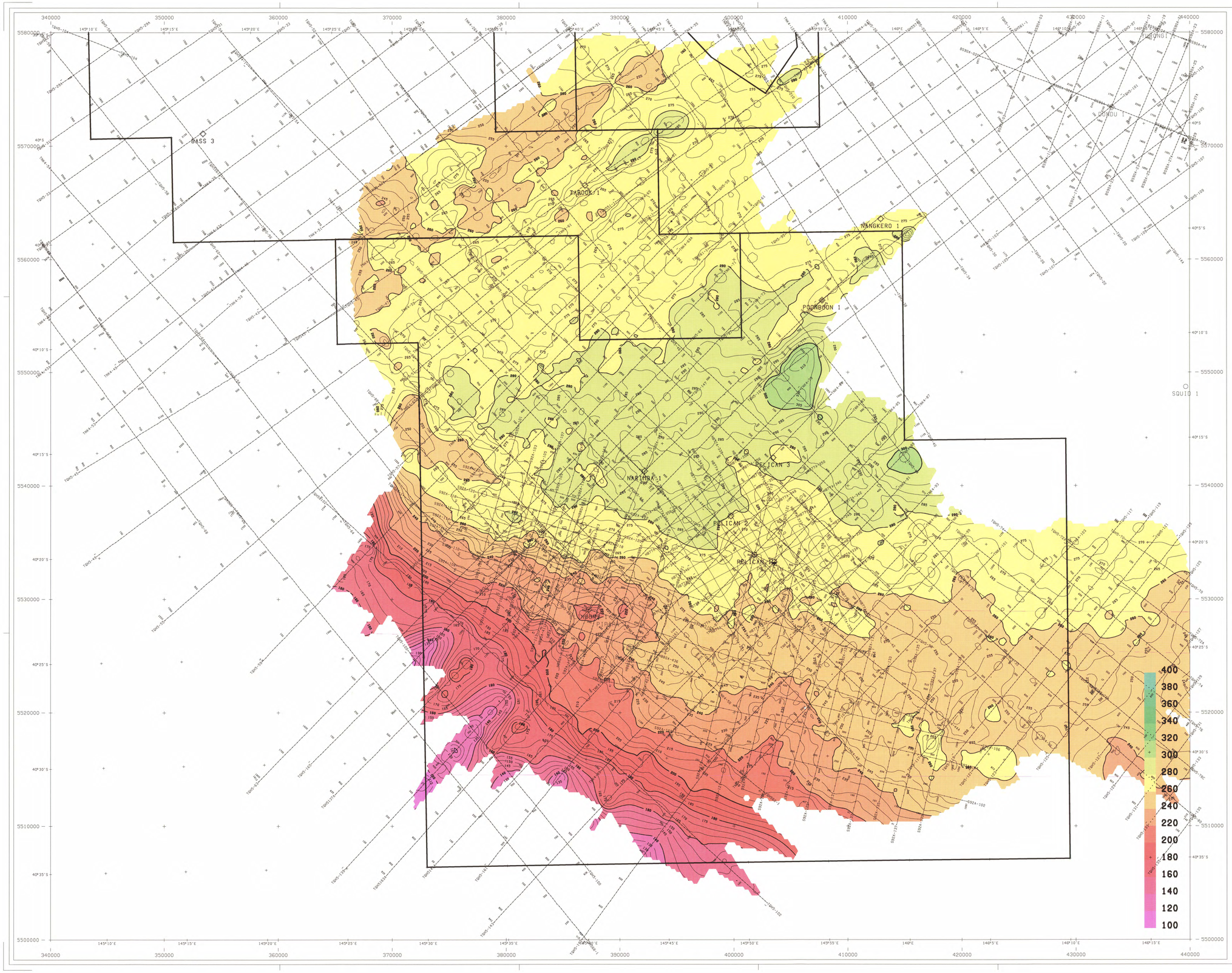
0 5000 10000 15000 m

SCALE : 1 : 100000

DATE : 05-MAY-94, 09:22:52

ENCLOSURE 1B
OR-0382 VOL III

djk t25p-101.hpgl



SAGASCO Resources Ltd

SAGASCO RESOURCES LTD

BASS BASIN

Isochron of Lower to Middle Miocene (approximately)

N

PROSPECT : t25p

INTERFACE : 15 1

491527

BASE MAP, WELLS AND CULTURE

TIME CONTOUR MAP

PROJECTION:	UTM SOUTH
SPHEROID:	AUSTRALIAN NATIONAL
CENTRAL MERIDIAN:	147° 0m 0.000S
SCALE REDUCTION FACTOR:	0.9996000
(LAT,+LONG) SYSTEM:	SEXAGESIMAL
X-Y UNIT:	METER

5 cm

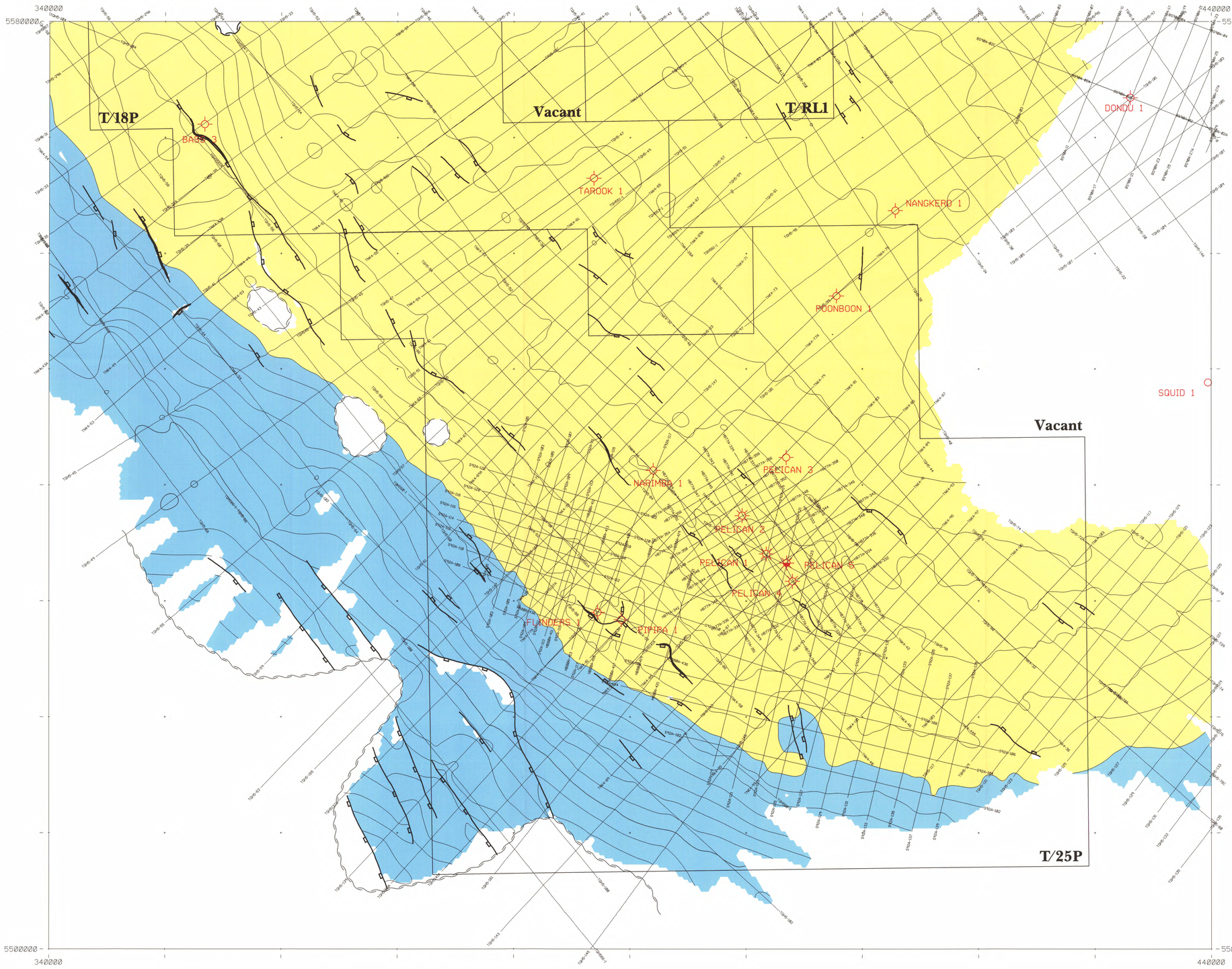
0 5000 10000 15000 m

SCALE : 1 : 100000

DATE : 10-MAY-94, 14:48:19

ENCLOSURE 19
GR: 0383 VOL III

SAGASCO Resources Ltd.



KEY

	<0.5%
	0.5 – 0.7%
	0.7 – 1.0%
	1.0 – 1.3%
	1.3 – 2.6%
	>2.6%

N

0 15km.

5 cm

Scale 1:100000

BASS BASIN T/25P

VITRINITE REFLECTANCE AT TOP EVCM

491528

No: 10844.0794

OR-0382 VOL III ENCLOSURE 80

SAGASCO Resources Ltd.

340000
5580000
440000
5500000

T/18P

Vacant

T/RL1

Vacant

T/25P

BASS 3
TAROOK 1
NANGKERO 1
DONDU 1
DUONBOON 1
SQUID 1
MARIMBA 1
PELICAN 3
PELICAN 2
PELICAN 5
PELICAN 4
PELICAN
FLINDERS 1
PIPIPA 1

KEY

	<0.5%
	0.5 – 0.7%
	0.7 – 1.0%
	1.0 – 1.3%
	1.3 – 2.6%
	>2.6%

N

0 15km.

5 cm

Scale 1:100000

BASS BASIN T/25P

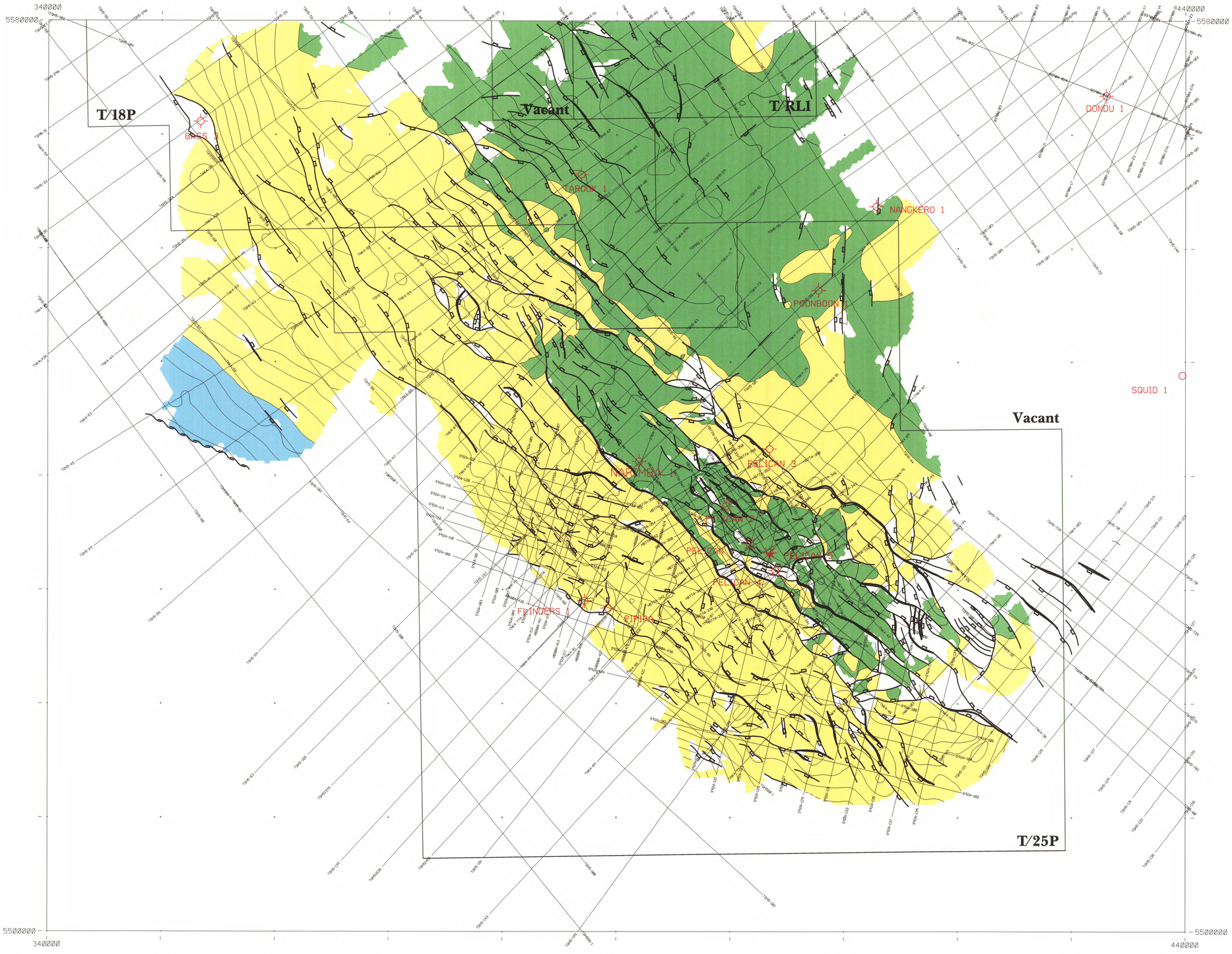
VITRINITE REFLECTANCE TOP UPPER M.DIVERSUS

491529

OR. 0382 VOL III

No: 10843.0794 ENCLOSURE 91.

SAGASCO Resources Ltd.



KEY

	<0.5%
	0.5 – 0.7%
	0.7 – 1.0%
	1.0 – 1.3%
	1.3 – 2.6%
	>2.6%

N

0 15km.

5 cm

Scale 1:100000

BASS BASIN T/25P

VITRINITE REFLECTANCE TOP MIDDLE M.DIVERSUS

491530

CR0382 VOL III

No: 10842.0794

ENCLOSURE 33.

SAGASCO Resources Ltd.

340000
5580000
440000
5500000

T/18P
Vacant
T/RL1
Vacant
T/25P

BASS 1
TARUCK 1
NANGKEDO 1
DONDU 1
POONBOON 1
SQUID 1
PELICAN 3
PELICAN 1
PELICAN 2
PELICAN 4
FLINDERS 1
PIPIRI 1

KEY

	<0.5%
	0.5 — 0.7%
	0.7 — 1.0%
	1.0 — 1.3%
	1.3 — 2.6%
	>2.6%

N

0 15km.

Scale 1:100000

BASS BASIN T/25P

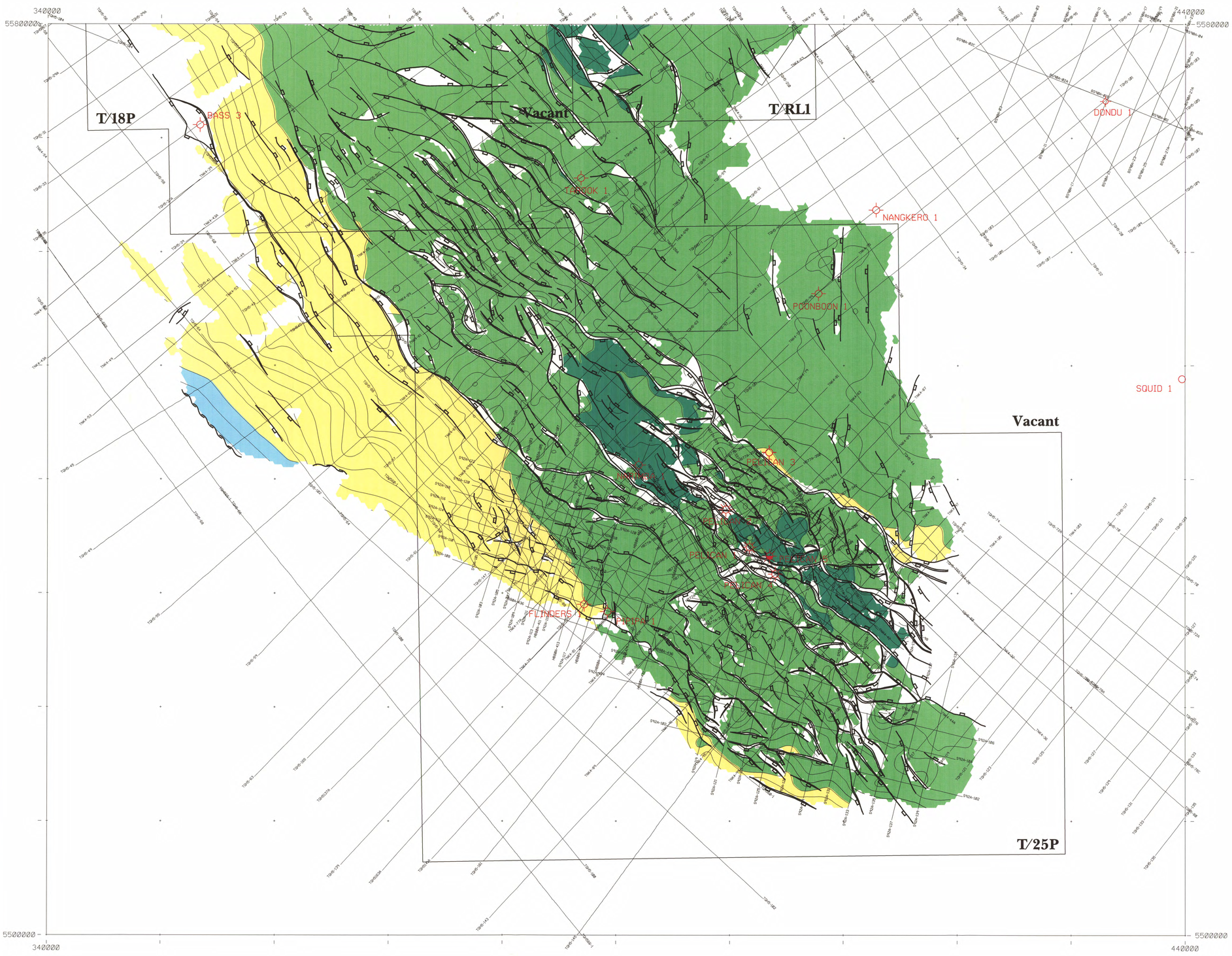
VITRINITE REFLECTANCE TOP LOWER M.DIVERSUS

491531

No: 10841.0794

OR 03830 VOL III
ENCLOSURE 33

SAGASCO Resources Ltd.



KEY

	<0.5%
	0.5 – 0.7%
	0.7 – 1.0%
	1.0 – 1.3%
	1.3 – 2.6%
	>2.6%

N

0 15km.

Scale 1:100000 5 cm

BASS BASIN T/25P

VITRINITE REFLECTANCE TOP PALAEOCENE

491532

No: 10840.0794 OR 0382 Vol III Enclosure 24.

SAGASCO Resources Ltd.

340000
5580000
440000
5580000

T/18P
Vacant
T/RL1
Vacant
T/25P

BASS 3
TARROOK 1
NANGKERO 1
DONDU 1
ROONBOON 1
SQUID 1
NARIMBA 1
PELICAN 3
PELICAN 2
PELICAN 1
PELICAN 5
PELICAN 4
FLINDERS 1
PIPIPA 1

KEY

	<0.5%
	0.5 – 0.7%
	0.7 – 1.0%
	1.0 – 1.3%
	1.3 – 2.6%
	>2.6%

N

0 15km.

Scale 1:100000

5 cm

5500000
340000
440000
5500000

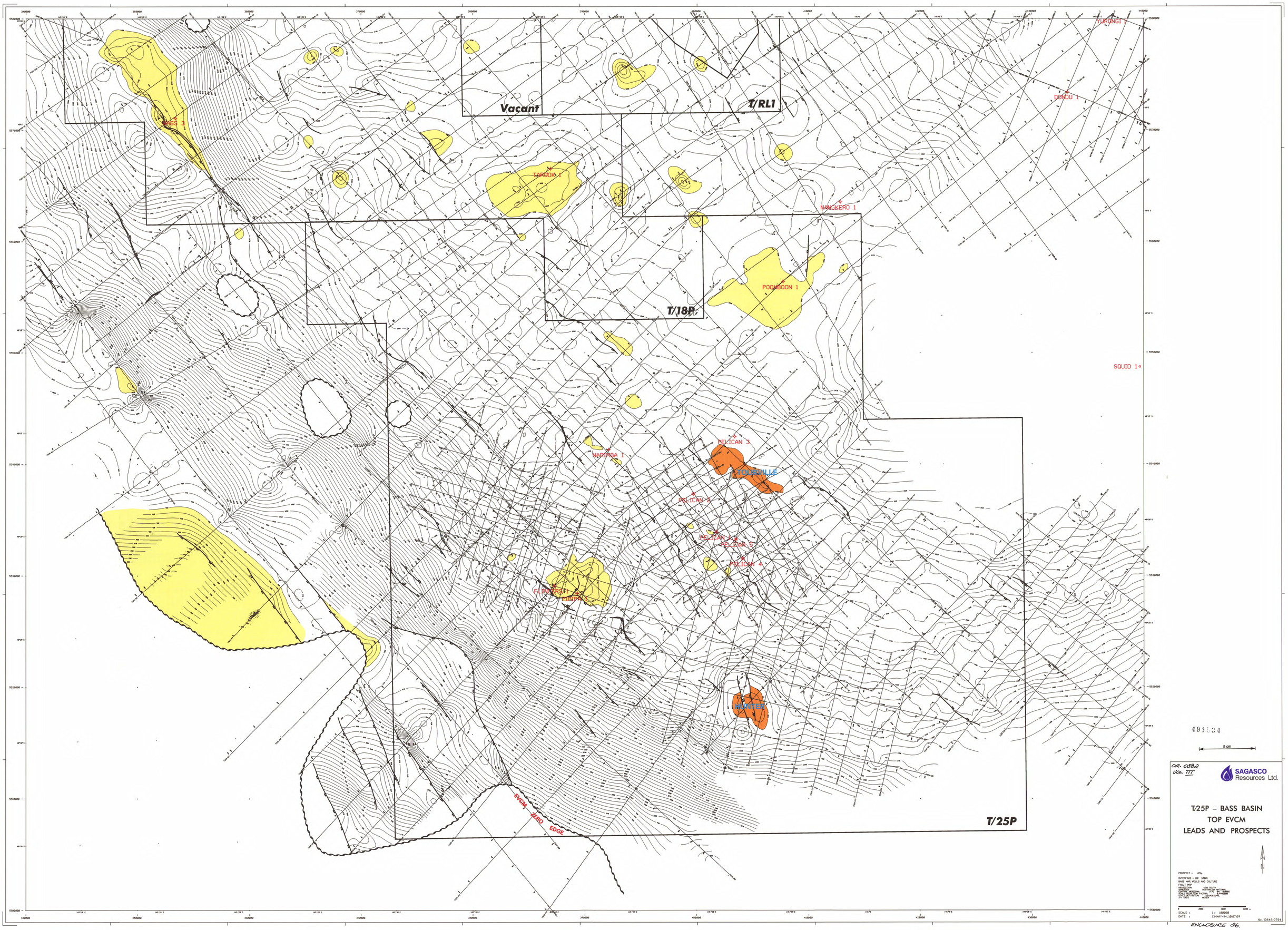
BASS BASIN T/25P

BASEMENT VITRINITE REFLECTANCE

491533

ENCLOSURE 85

No: 10947.0894 GR.0382 Vol III



491534

OR. 0382
VOL. III

SAGASCO Resources Ltd.

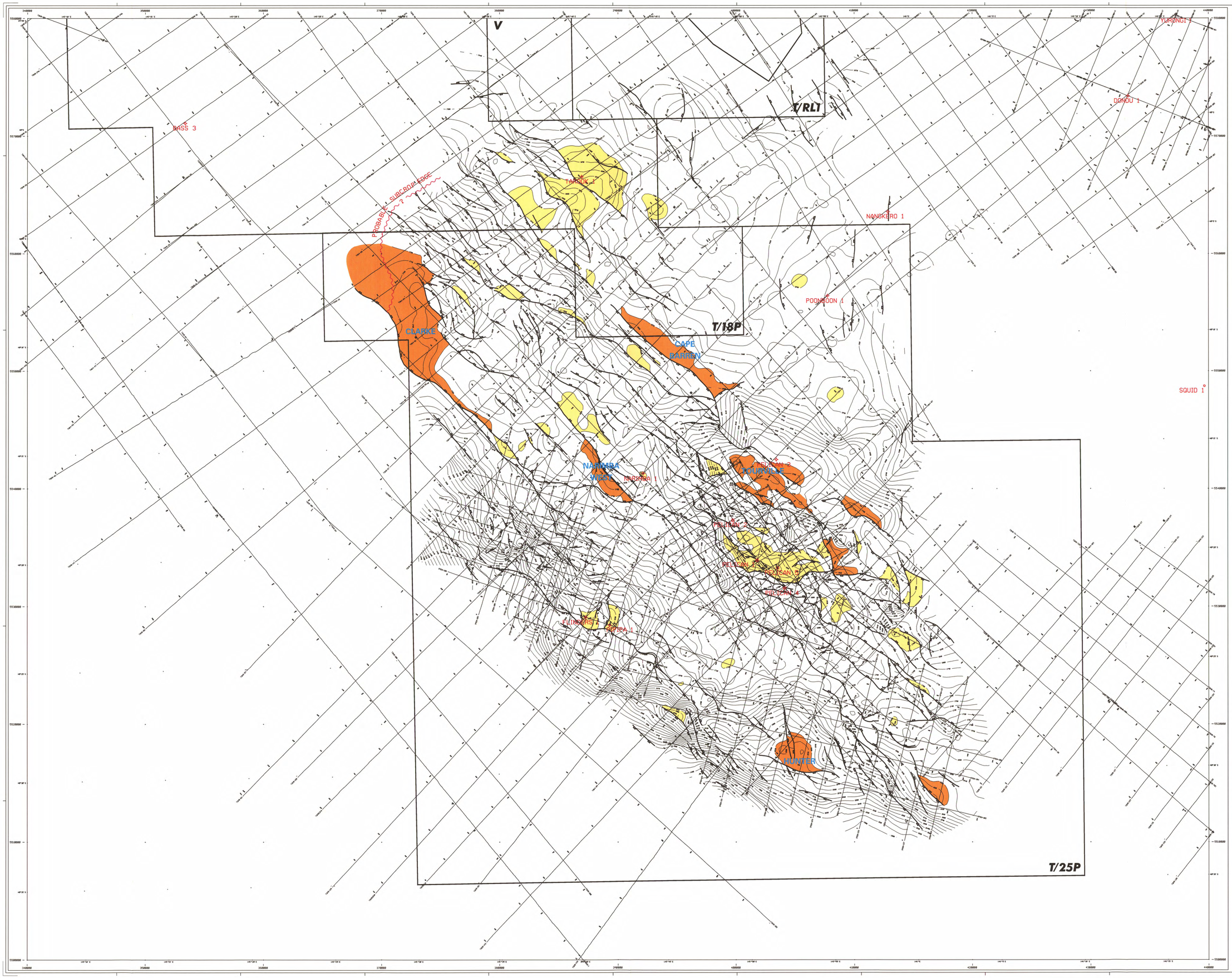
T/25P – BASS BASIN
TOP EVCM
LEADS AND PROSPECTS

PROSPECT : 425p
INTERFACE : 1:10 100MS
BASE MAP, WELLS AND CULTURE
FAULT MAP
PROJECTION: UTM ZONE 54
SPHEROID: AUSTRALIAN NATIONAL
CENTRAL MERIDIAN: 141° 00' E
SCALE FACTOR: 0.9996
FALSE EASTING: 500,000.000
FALSE NORTHING: 10,000,000.000
X-Y UNITS: METER

SCALE : 1 : 100000
DATE : 13-MAY-94, 10h07r59

No. 10645-0794

ENCLOSURE 26.



5 cm

OR-0382
VOL III

SAGASCO Resources Ltd.

T/25P – BASS BASIN
TOP UPPER M.DIVERSUS
LEADS AND PROSPECTS

491535

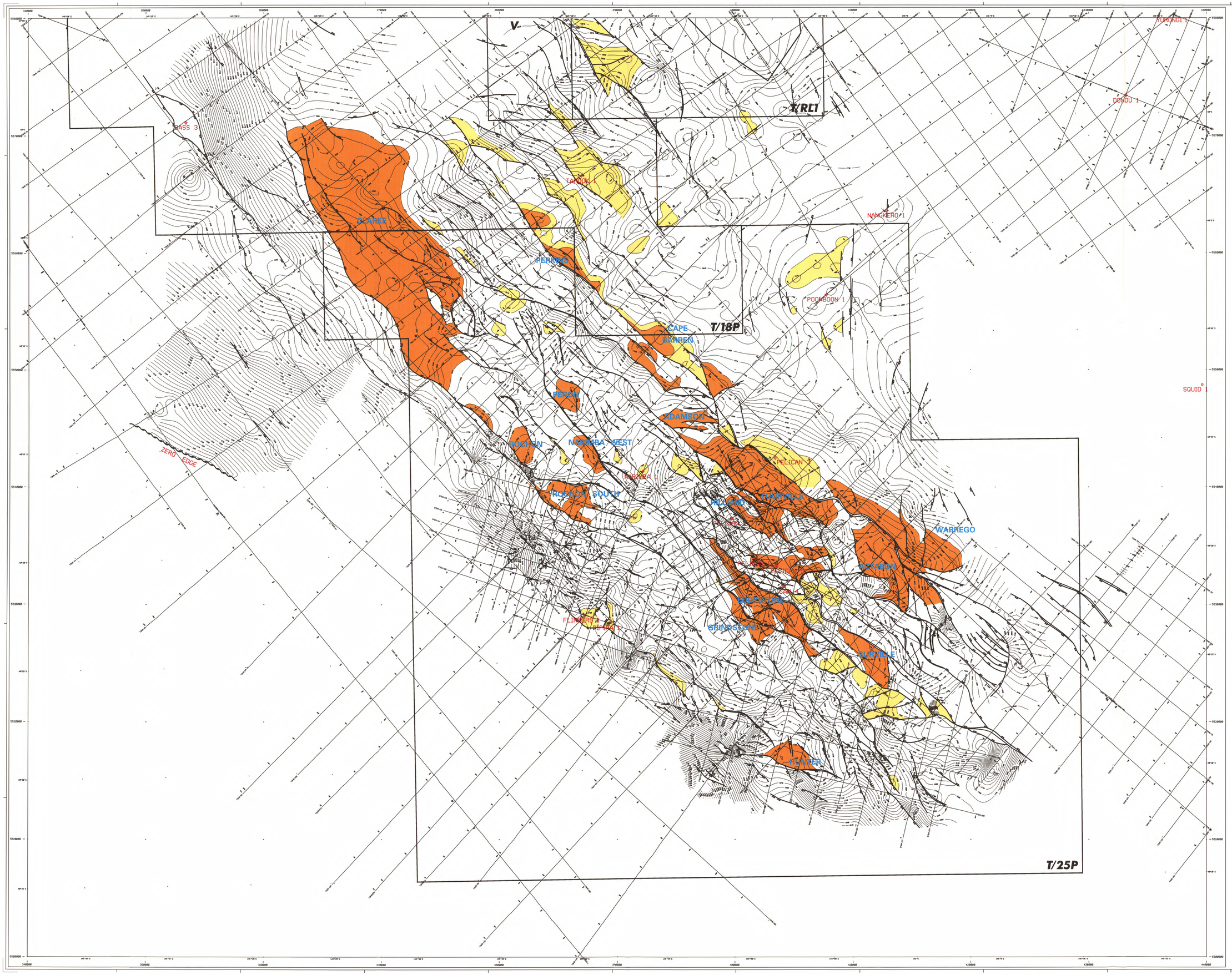
PROSPECT : T25P
INTERFACE : 145 100MM
BASE MAP, WELLS AND CULTURE
FAULT MAP
PROJECTION: UTM SOUTH
SPHEROID: AUSTRALIAN NATIONAL
DATUM: AUSTRALIAN NATIONAL
CONTOUR INTERVAL: 1/10 MM = 0.0005
SCALE PROJECTION FACTOR: 0.9996000
X-Y ORIGIN: 0 MM
Z-Y UNIT: METER

0 2000 4000 6000 m

SCALE : 1 : 100000
DATE : 13-MAY-94, 15:49:32

No. 10646.0794

ENCLOSURE 27.



5 cm

OR. 0382
VOL III

SAGASCO Resources Ltd.

T/25P – BASS BASIN
TOP MIDDLE M.DIVERSUS
LEADS AND PROSPECTS

491536

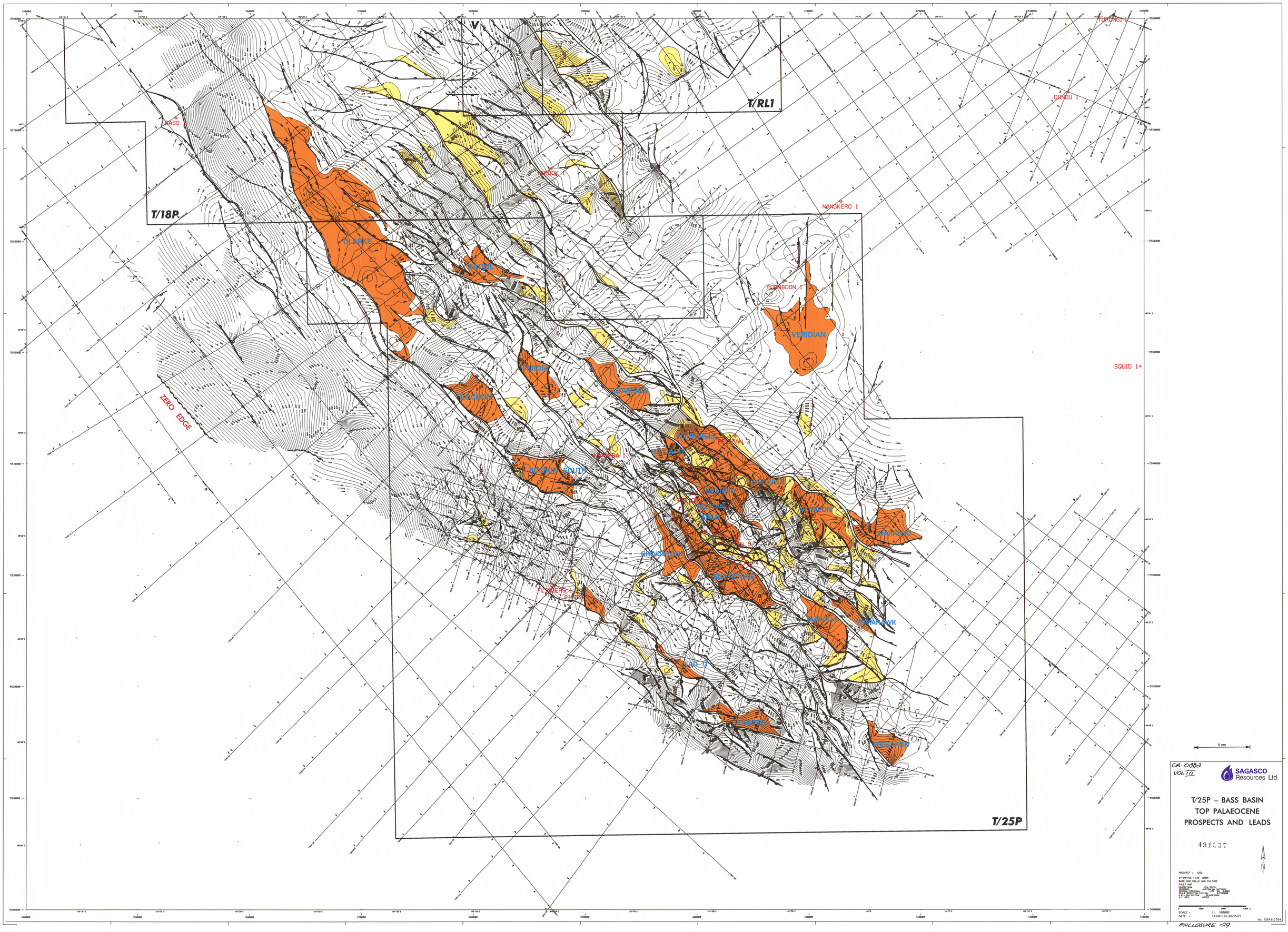
PROSPECT : T25P
INTERFACE : 155 1000L
BASE MAP, WELLS AND CULTURE
FAULT MAP
PROJECTION: UTM SOUTH
DATUM: AUSTRALIAN NATIONAL
CENTRAL MERIDIAN: 147° 00' 0.0000
SCALE MODIFICATION: 0.9996000
ELEV. AND DEPTH: 1000 MILLIMETERS
X-Y UNITS: METER

0 2000 4000 6000 m

SCALE : 1 : 100000
DATE : 13-MAY-94, 15:53:50

No. 15647.0794

ENCLOSURE 28



OR-0382
VOL III

SAGASCO Resources Ltd.

T/25P – BASS BASIN
TOP PALAEOCENE
PROSPECTS AND LEADS

491537

PROSPECT : 425p
INTERFACE : 170 1000
BASE MAP, WELLS AND CULTURE
FAULT MAP
PROJECTION: UTM ZONE 55
DATUM: AUSTRALIAN NATIONAL
SPHEROID: GRS 1980
CENTRAL MERIDIAN: 147° 00' 00.0000
SCALE REDUCTION FACTOR: 0.9996000
X-Y GRID SYSTEM: MERIDIAN
X-Y ORIGIN: METER

0 2000 4000 6000 m

SCALE : 1 : 100000
DATE : 13-MAY-94, 09:35:29

No. 10648.0794

ENCLOSURE 29.