DEPT. NAT. RES & ENV
PE900935

PARKER & PARSLEY
AUSTRALASIA LIMITED

PEP 108

OTWAY BASIN - VICTORIA

MYLOR #1

WELL COMPLETION REPORT

VOLUME 2

NOVEMBER 1994

Well Completion Report vol. 2

Mylor-1

(W1102)

APPENDIX 3

PETROLEUM DIVISION

23 MAR 1995

APPENDIX

3. Palynological Report

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PALYNOLOGY OF BRIDGE MYLOR-1

ONSHORE OTWAY BASIN, VICTORIA

BY

ROGER MORGAN

for **BRIDGE OIL**

Sept 1994

OTW.RPMYLOR

PALYNOLOGY OF BRIDGE MYLOR-1

ONSHORE OTWAY BASIN, VICTORIA

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I SUMMARY

1388.0m(swc), 1391.0m(swc) : upper *apoxyexinus* Zone (upper *cretacea* Dino Zone) : late Santonian : very nearshore marine : immature for hydrocarbons : seen in Paaratte and Belfast Formations and equivalents

1500.0m(swc), 1515.0m(swc) : middle *apoxyexinus* Zone (lower *cretacea* Dino Zone) : mid Santonian : nearshore marine : immature to early marginal mature for oil, immature for gas/condensate : seen in the Paaratte and Belfast Formations and equivalents

1650.0m(swc), 1658.0m(swc) : lower *apoxyexinus* Zone : early Santonian : nearshore marine : marginally mature for oil, immature for gas/condensate : seen in the Belfast and Flaxmans Formations and equivalents

1672.0m(swc) : *mawsonii* Zone : Turonian-Coniacian : brackish lagoon : marginally mature for oil, immature for gas/condensate, algal rich : seen in the Belfast and Flaxmans Formations and equivalents

1758.5m(swc), 1763.0m(swc) : extremely lean and zonally indeterminate, apparently non-marine or slightly brackish : marginally mature for oil, immature for gas/condensate

1833.0m(swc) : apparently *paradoxa* Zone, but the usual markers are extremely rare as in the sandy Eumeralla facies offshore : mid Albian : slightly brackish lagoon : borderline mature for oil, borderline marginally mature for gas/condensate : usually Eumeralla Formation.

II INTRODUCTION

After well completion, ten sidewall cores were submitted for detailed study. All results are summarised herein.

Palynomorph occurrence data are shown as Appendix I and form the basis for the assignment of the samples to five spore-pollen and dinoflagellate units of Santonian to Albian age. Specimen counts were made on all assemblages and expressed in the raw data as percentages. The marine fossils are presented as a percentage of total fossils (marine plus non-marine) in the raw data in Appendix 1 as an expression of marineness.

The Cretaceous spore-pollen zonation is essentially that of Dettmann and Playford (1969), but has been significantly modified and improved by various authors since, and most recently discussed in Helby et al (1987), as shown on Figure 1. The Late Cretaceous zonation has been modified by Morgan (1992) in project work and recent offshore drilling for BHPP and partners.

Maturity data was generated in the form of Spore Colour Index, and is plotted on Figure 2 Maturity Profile of Mylor-1. The oil and gas windows on Figure 2 follow the general consensus of geochemical literature. The oil window corresponds to spore colours of light-mid brown (Staplin Spore Colour Index of 2.7) to dark brown (3.6). These correspond to Vitrinite Reflectance values of 0.6% to 1.3%. Geochemists argue variations on kerogen type, basin type and basin history. The maturity interpretation is thus open to reinterpretation using the basic colour observations as raw data. However, the range of interpretation philosophies is not great, and probably would not move the oil window by more than 200 metres.

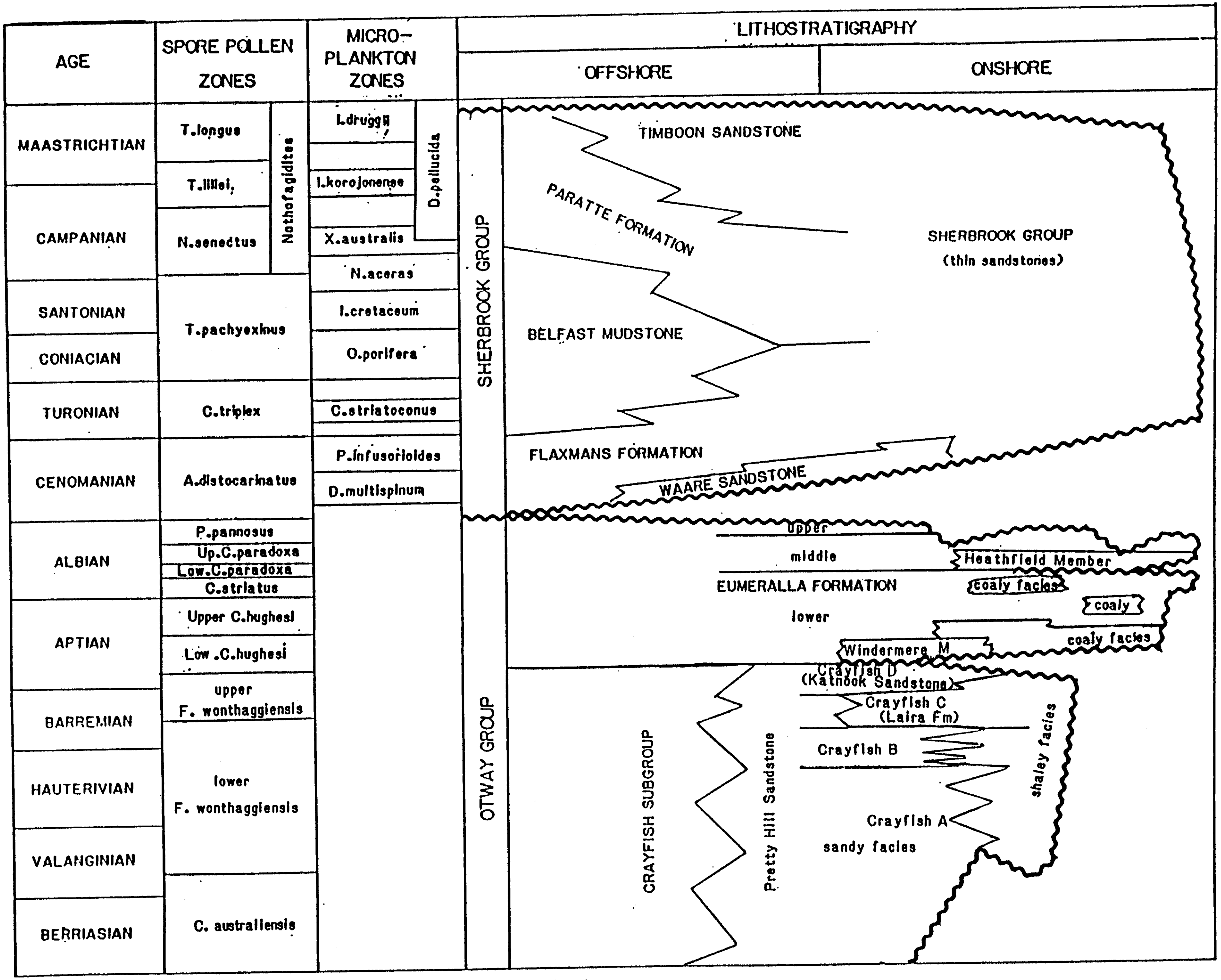

FIGURE 1. CRETACEOUS REGIONAL FRAMEWORK, OTWAY BASIN

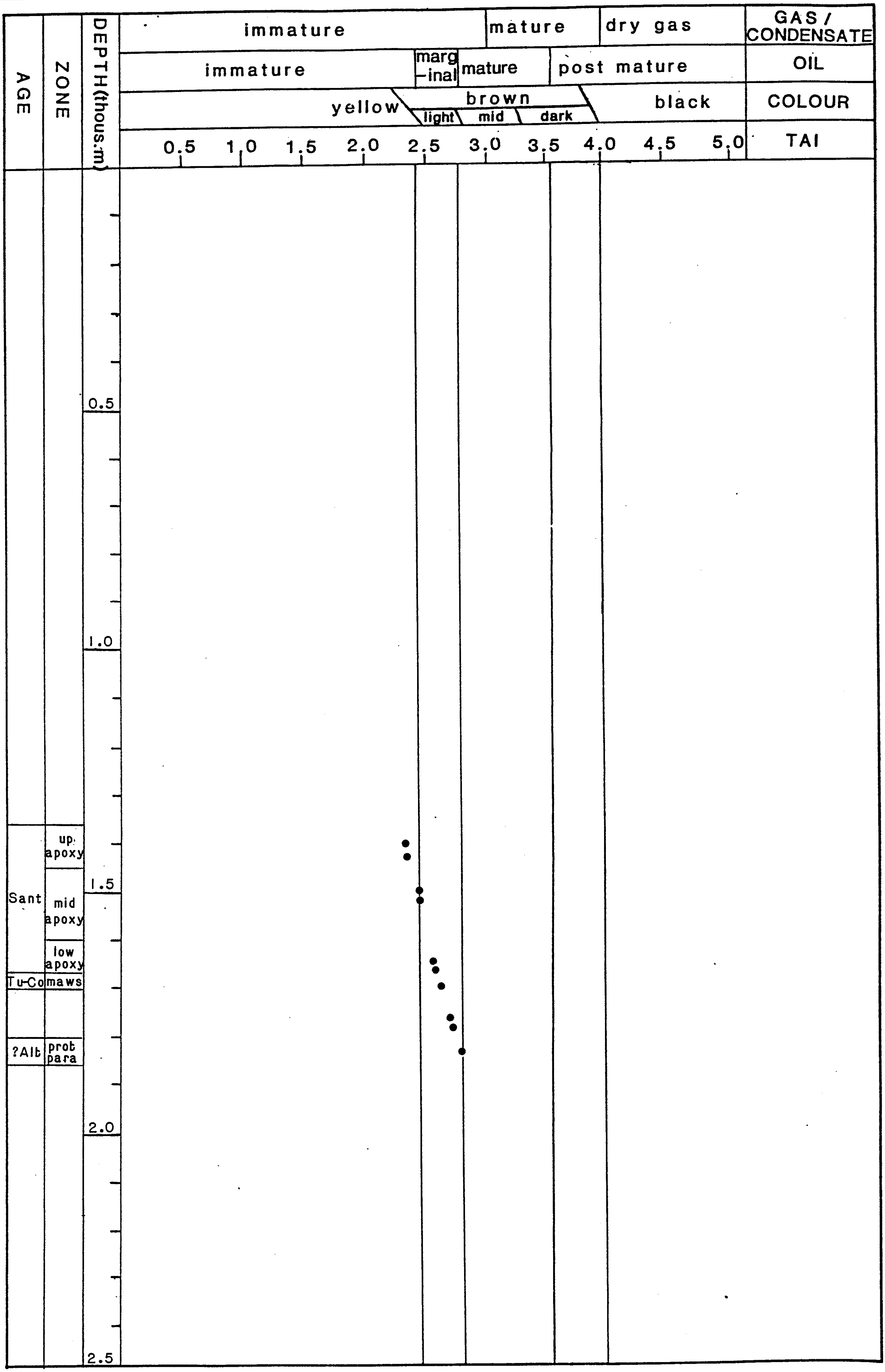

FIGURE 2 MATURITY PROFILE : MYLOR-1

III PALYNOSTRATIGRAPHY

A 1388.0m(swc), 1391.0m(swc) : upper *apoxyexinus* Zone (upper *cretacea* dino Zone)

Assignment to the upper *Tricolporites apoxyexinus* Zone of late Santonian age is indicated at the top by the absence of younger markers (such as *Nothofagidites senectus*) and at the base by consistent but rare *Amosopollis cruciformis* (1% or less). *Falcisporites* and *Microcachryidites* are common with *Australopollis obscurus*, *Cyathidites*, *Osmundacidites*, *Podosporites*, *Proteacidites* spp and *Vitreisporites* frequent. Angiosperms are rare with *Tricolpites gillii* and *Tricolporites apoxyexinus* seen.

Assignment to the upper *Isabelidinium cretacea* dinoflagellate Zone is indicated at the top by youngest *Amphidiadema denticulata* and *Isabelidinium belfastense rotundata* and at the base by oldest *Isabelidinium belfastense belfastense*. Dinoflagellates are all rare but *Heterosphaeridium heteracanthum* is the most frequent. *Trithyrodinium* spp and *Odonotochitina* spp are striking elements.

Environments are very nearshore marine, as shown by the low dinoflagellate content (3% and 11% downhole) and moderate diversity.

These features are normally seen in the Paaratte Formation (including the Skull Creek and Nullaware Members) and Belfast Mudstone and their equivalents. They occur in the Sherbrook Group above the Shipwreck Group offshore.

Yellow to light brown spore colours indicate immaturity for hydrocarbon generation.

B 1500.0m(swc), 1515.0m(swc) : middle *apoxyexinus* Zone (lower *cretacea* dino Zone)

Assignment to the middle *T. apoxyexinus* Zone is indicated at the top by the downhole influx of *A. cruciformis* and at the base by the absence of older indicators. *Cyathidites* and *Falcisporites* were common, with *Dilwynites*, *Podosporites*, *Proteacidites* and *Vitreisporites* frequent. *T. gillii* occurs only at 1500m. Very rare elements include *Aequitriradites* spp, *Australopollis obscurus*, *Foraminisporis wonthaggiensis*, and *Phyllocladidites mawsonii*.

Assignment to the lower *I. cretacea* dinoflagellate Zone is indicated at the top by the absence of younger markers and at the base by oldest *I. cretacea*. *Heterosphaeridium* spp are frequent to common with rare taxa including *Odontochitina* spp, *O. porifera* and *Trithyrodinium* spp.

Nearshore marine environments are indicated by the low dinoflagellate content (19 and 23% downhole), and their moderate diversity.

These features are normally seen in th Paaratte Formation and Belfast Mudstone and their equivalents. They occur in the Sherbrook Group above the Shipwreck Group offshore.

Light brown to yellow spore colours indicate early marginal maturity for oil and immaturity for gas/condensate.

C 1650.0m(swc), 1658.0m(swc) : lower *apoxyexinus* Zone

Assignment to the lower *T. apoxyexinus* Zone is indicated at the top by the major downhole influx of *A. cruciformis* (9-14%) and at the base by the base of the *A. cruciformis* acme and absence of older markers. *Dilwynites granulatus* is very common, with *Falcisporites* and *A. cruciformis* common. Rare elements include *A. obscurus*, *Clavifera triplex* and *P. mawsonii*.

Dinoflagellates are rare and lack the published zone markers. However, youngest *Aptea* sp (1658m) *Chlamydophorella ambigua* and consistent *Circulodinium deflandrei* (1650m) usually occur within the lower *apoxyexinus* Zone and so are consistent. *Heterosphaeridium* spp *C. deflandrei* and *Spiniferites* spp are the most frequent taxa. A small undescribed acritarch informally called *Rectanguladinium* sp occurs only in these two samples and may have future biostratigraphic significance.

Nearshore marine environments are indicated by the low to moderate dinoflagellate content (17 and 34% downhole) and their moderate diversity.

These features are normally seen in the Belfast Mudstone and Flaxmans Formations and their equivalents. They occur in the upper Shipwreck Group offshore.

Light brown spore colours indicate marginal maturity for oil and immaturity for gas/condensate.

D 1672.0m(swc) : *mawsonii* Zone

Assignment to the *Phyllocladidites mawsonii* Zone of Coniacian-Turonian age is indicated at the top by youngest *Appendicisporites distocarinatus* and at the base by oldest *P. mawsonii*. *Cyathidites* spp are abundant with *Microcachryidites* and *Vitreisporites* common, and *Dilwynites* and *Falcisporites* frequent.

Dinoflagellates are very scarce, with only a few single specimens seen. Brackish environments are therefore indicated with the dinoflagellates comprising less than 1% of the assemblage and of very low diversity. Freshwater algae (*Botryococcus*) are abundant (17%) and suggest lacustrine environments. The rare dinoflagellates however argue for minor saline influence and a tidal lagoon or coastal lake are likely.

These features are normally seen in the Belfast and Flaxmans Formations and their equivalents. They occur in the lower part of the upper Shipwreck Group offshore, including the reservoir section in the Minerva field.

Light brown spore colours indicate marginal maturity for oil and immaturity for gas/condensate.

E 1758.5m(swc), 1763.0m(swc) : lean and indeterminate

These two samples are extremely lean and dominated by inertinite and cuticle fragments. The relatively rare age diagnostic taxa were not seen and they cannot be assigned to any zone. *Falcisporites* are abundant with *Cyathidites* and *Odmundacidites* common and *Retitriletes austroclavatidites* frequent. Permian reworking is prominent.

At 1758.5m, saline markers are absent and freshwater algae (*Botryococcus*) comprises 4% of the assemblage. This suggests freshwater environments with lacustrine influence. However, too little material is available to deny the possibility of marine influence.

At 1763m, spiny acritarchs (3%) indicate slight saline influence. Freshwater algae (*Botryococcus* and *Schizosporis*) are present. Slightly brackish environments are therefore indicated.

Light brown spore colours indicate marginal maturity for oil and immaturity for gas/condensate.

F 1833.0m : apparently *paradoxa* Zone

Assignment to the *Coptospora paradoxa* Zone of mid Albian age is suggested at the top by the absence of younger markers (such as *Phimopollenits pannosus*) with youngest *C. paradoxa* and at the base by oldest *C. paradoxa*. However, the assemblage lacks rich heavy spore assemblages normally seen in Eumeralla Formation claystones, as apparently occurs in recent offshore drilling nearby. Instead, the assemblage is very bland, dominated by saccates and smooth spores, and lacking the usual diverse ornamented spore assemblage. As a result, this assemblage might be as young as the Cenomanian *distocarinatus* Zone.

In five microscope slides examined, I saw only one specimen of *C. paradoxa*, two specimens of *Foraminisporis asymmetricus* and no *Crybelosporites striatus*. These are usually all consistent in the Eumeralla Formation.

Brackish influence is slight but seen in very rare spiny acritarchs amongst the dominant and diverse spores and pollen. Freshwater algae (*Botryococcus*) are frequent (5%) suggesting lakes. Brackish nearshore lagoons seem likely.

The *paradoxa* Zone is usually seen in the Eumeralla Formation. However, the tentative nature of the assignment means that palynology cannot definitively confirm penetration of the Eumeralla. This must rest on lithological or other criteria. Palynologically, it is not impossible that the Eumeralla was not drilled.

IV REFERENCES

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Morgan RP (1992) Overview of new cuttings based Late Cretaceous correlations, Otway Basin, Australia **unpubl. rept. for BHPP**.

MYLOR #1

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C L I E N T: BRIDGE OIL LTD

W E L L: MYLOR #1

F I E L D / A R E A: ONSHORE OTWAY BASIN, PEP 108, VICTORIA

A N A L Y S T: ROGER MORGAN   D A T E: SEPTEMBER '94

N O T E S: ALL DEPTHS IN METRES. ALL FIGURES ARE PERCENTAGES. X MEANS THAT SPECIES IS VERY RARE AND OCCURRED OUTSIDE GRAIN COUNT. IN UNCOUNTED SAMPLES A=ABUNDANT, C=COMMON, F=FREQUENT.

RANGE CHART OF OCCURRENCES BY % & LOWEST APPEARANCE: grouped

No.	Taxon	1388.0 SWC 30	1391.0 SWC	1500.0 SWC	1515.0 SWC	1650.0 SWC	1658.0 SWC	1672.0 SWC	1758.0 SWC	1763.0 SWC	1833.0 SWC
1	--- MICROPLANKTON CONTENT (%) ---	3	11	23	19	17	34	<1	0	3	0
2	MICRHYSTRIDIUM	.	X	.	1	.	.	.	.	3	X
3	VERYHACHIUM	.	.	.	2	1	X	.	.	.	X
4	HETEROSPHAERIDIUM CONJUNCTUM	X	.	X	3	1	X	X	.	.	.
5	SUBTILISPHAERA SP	.	.	.	.	.	.	2	.	.	.
6	TRITHYRODINIUM MARSHALLII	.	X	X	2	3	.	X	.	.	.
7	ALTERBIA ACUMINATUM	.	.	.	.	.	X	.	.	.	.
8	APTEA SP	.	.	.	.	.	12	.	.	.	.
9	CHLAMYDOPHORELLA AMBIGUA	.	.	.	.	X	3	.	.	.	.
10	CIRCULODINIUM DEFLANDREI	.	.	.	X	4	2	.	.	.	.
11	CRIBROPERIDINIUM SPP	.	.	.	.	X	X	.	.	.	.
12	EXOCHOSPHAERIDIUM PHRAGMITES	X	1	.	X	1	1	.	.	.	.
13	FLORENTINIA DEANEI	.	.	.	.	.	1	.	.	.	.
14	HETEROSPHAERIDIUM HETEROCANTHUM	1	4	10	3	3	X	.	.	.	.
15	HETEROSPHAERIDIUM SOLIDA	.	X	7	2	.	1	.	.	.	.
16	KIOKANSIUM POLYPES	.	.	.	.	.	3	.	.	.	.
17	KIOKANSIUM RECURVATUM	.	.	.	.	.	1	.	.	.	.
18	NUMMUS SP	.	.	.	X	1	4	.	.	.	.
19	ODONTOCHITINA OPERCULATA	.	.	.	X	.	X	.	.	.	.
20	OLIGOSPHAERIDIUM COMPLEX	.	.	.	X	X	1	.	.	.	.
21	PALAEOHYSTRICHOSPHORA INFUSORIOIDES	2	.	.	.	X	1	.	.	.	.
22	RECTANGULADINIUM SP	.	.	.	.	X	X	.	.	.	.
23	SPINIFERITES FURCATUS/RAMOSUS	.	.	1	3	2	4	.	.	.	.
24	TRICHODINIUM	.	.	.	.	.	1	.	.	.	.
25	CALLAOISPHAERIDIUM ASYMMETRICUM	.	.	.	X	X	.	.	.	.	.
26	CRIBROPERIDINIUM EDWARDSII	.	.	.	.	X	.	.	.	.	.
27	CYCLONEPHELIUM MEMBRANIPHORUM	.	.	.	.	X	.	.	.	.	.
28	HYSTRICHODINIUM PULCHRUM	.	.	1	.	1	.	.	.	.	.
29	ISABELIDINIUM SP	.	.	.	.	X	.	.	.	.	.
30	CASSICULOSPHAERIDIA GIANT	.	.	X	X	.	.	.	.	.	.
31	FROMEA FRAGILIS	.	.	.	X	.	.	.	.	.	.
32	GILLINIA HYMENOPHORA	.	.	.	1	.	.	.	.	.	.
33	ISABELIDINIUM CRETACEUM	X	.	2	X	.	.	.	.	.	.
34	ODONTOCHITINA COSTATA	.	.	X	X	.	.	.	.	.	.
35	ODONTOCHITINA CRIBROPODA	X	.	X	X	.	.	.	.	.	.
36	ODONTOCHITINIA PORIFERA	.	.	X	X	.	.	.	.	.	.
37	PALAEOPERIDINIUM CRETACEUM	.	.	.	X	.	.	.	.	.	.
38	TRITHYRODINIUM PUNCTATE	.	.	.	2	.	.	.	.	.	.

No.	Species	1388.0 SWC 30	1391.0 SWC	1500.0 SWC	1515.0 SWC	1650.0 SWC	1658.0 SWC	1672.0 SWC	1758.0 SWC	1763.0 SWC	1833.0 SWC
39	TRITHYRODINIUM THICK RETICULATE	X	X	2	X	.	.	.	.	.	.
40	CHATANGIELLA VICTORIENSIS	.	.	X	.	.	.	.	.	.	.
41	EUCLADINIUM MADURENSE	X	.	X	.	.	.	.	.	.	.
42	HETEROSPHAERIDIUM CF LATEROBRACHIUS	.	.	X	.	.	.	.	.	.	.
43	ODONTOCHITINIA TRIANGULARIS	.	.	X	.	.	.	.	.	.	.
44	PARALECANIELLA	.	.	X	.	.	.	.	.	.	.
45	CANNINGIA SPP	X	2	.	.	.	.	.	.	.	.
46	HETEROSPHAERIDIUM ROBUSTA	.	X	.	.	.	.	.	.	.	.
47	ISABELIDINIUM BELFASTENSE	X	X	.	.	.	.	.	.	.	.
48	ODONTOCHITINA STUBBY	.	2	.	.	.	.	.	.	.	.
49	TRITHYRODINIUM THICK PSILATE	.	2	.	.	.	.	.	.	.	.
50	AMPHIDIADEMA DENTICULATA	X	.	.	.	.	.	.	.	.	.
51	AUSTRALISPHAERA SP	X	.	.	.	.	.	.	.	.	.
52	ISABELIDINIUM ROTUNDATA	?	.	.	.	.	.	.	.	.	.
53	ISABELIDINIUM TRIPARTITA	X	.	.	.	.	.	.	.	.	.
54	OLIGOSPHAERIDIUM PULCHERRIMUM	X	.	.	.	.	.	.	.	.	.
55	AEQUITRIRADITES SPINULOSUS	.	.	.	X	.	.	.	.	.	X
56	AEQUITRIRADITES TILCHAENSIS	.	.	.	.	.	.	.	1	.	X
57	AEQUITRIRADITES VERRUCOSUS	.	.	X	.	.	.	.	.	.	X
58	ARAUCARIACITES AUSTRALIS	1	3	.	.	2	1	2	1	1	1
59	CERATOSPORITES EQUALIS	X	1	X	3	1	X	1	4	1	2
60	CICATRICOSISPORITES AUSTRALIENSIS	X	1	1	.	.	1	X	.	X	X
61	CICATRICOSISPORITES HUGHESI	.	.	.	.	.	.	.	.	.	X
62	CONTIGNISPORITES GLEBULENTUS	.	.	.	.	.	.	.	.	.	X
63	COPTOSPORA PARADOXA	.	.	.	.	.	.	.	.	.	X
64	COROLLINA TOROSA	.	.	1	.	.	X	.	.	10	11
65	CRYBELOSPORITES STRIATUS	.	.	.	.	.	.	.	.	.	?
66	CYATHIDITES AUSTRALIS	1	1	4	2	3	1	12	11	5	2
67	CYATHIDITES MINOR	7	7	11	13	4	2	16	9	11	13
68	CYCADOPITES FOLLICULARIS	.	.	1	.	.	1	.	.	.	X
69	CYCLOSPORITES HUGHESI	.	.	.	.	.	.	.	.	.	X
70	DICTYOTOSPORITES COMPLEX	.	X	.	.	.	1	.	.	.	1
71	DICTYOTOSPORITES SPECIOSUS	.	.	.	.	.	.	.	.	.	X
72	DILWYNITES GRANULATUS	12	2	3	8	24	21	4	.	1	1
73	FALCISPORITES GRANDIS	3	3	1	1	.	1	2	8	6	4
74	FALCISPORITES SIMILIS	21	15	13	13	17	6	6	31	31	19
75	FORAMINISPORIS ASYMMETRICUS	.	.	.	.	.	.	.	.	.	X
76	FORAMINISPORIS DAILYI	.	.	.	.	.	.	.	.	.	X

1833.0 SWC	1763.0 SWC	1758.0 SWC	1672.0 SWC	1658.0 SWC	1650.0 SWC	1515.0 SWC	1500.0 SWC	1391.0 SWC	1388.0 SWC 30	No.	Species
1	.	.	X	.	.	X	1	.	.	77	FORAMINISPORIS WONTHAGGIENSIS
2	.	1	.	1	.	.	.	.	.	78	KLUKISPORITES SCABERIS
1	.	.	X	.	.	.	X	.	.	79	LEPTOLEPIDITES VERRUCATUS
7	5	1	11	3	7	4	2	10	13	80	MICROCACHRYIDITES ANTARCTICUS
X	.	.	.	.	.	.	.	.	.	81	NEVESISPORITES VALLATUS
15	13	13	1	3	4	2	4	7	.	82	OSMUNDACIDITES WELLMANII
1	.	.	.	.	.	.	.	.	.	83	PERINOPOLLENITES ELATOIDES
1	1	.	3	3	2	8	3	9	3	84	PODOSPORITES MICROSACCATUS
4	5	5	1	1	.	1	4	.	1	85	RETITRILETES AUSTROCLAVATIDITES
X	.	4	.	.	.	.	.	.	.	86	REWORKING - PERMIAN
8	3	3	2	.	.	5	2	3	1	87	STERIESPORITES ANTIQUASPORITES
X	.	.	.	.	.	.	.	.	.	88	TRIPOROLETES RETICULATUS
1	2	1	11	2	2	12	9	7	4	89	VITREISPORITES PALLIDUS
.	1	3	.	.	.	.	.	.	.	90	CALLIALASPORITES TURBATUS
.	.	.	X	14	9	X	3	X	1	91	AMOSOPOLLIS CRUCIFORMIS
.	.	.	X	.	.	.	.	.	.	92	APPENDICISPORITES DISTOCARINATUS
.	.	.	X	.	.	.	X	.	.	93	BALMEISPORITES HOLODICTYUS
.	.	.	1	.	.	.	.	1	.	94	DICTYOPHYLLIDITES
.	.	.	2	1	2	2	1	4	6	95	GLEICHENIIDITES
.	.	.	X	.	.	.	.	.	.	96	INTERULOBITES INTRAVERRUCATUS
.	.	.	4	.	1	.	1	1	2	97	LAEVIGATOSPORITES OVATUS
.	.	.	1	.	2	X	X	3	3	98	PHYLLOCLADIDITES MAWSONII
.	.	.	X	.	.	.	.	.	.	99	TRICOLPITES SPP
.	.	.	3	.	.	.	.	.	.	100	TRICOLPITES VARIVERRUCATUS
.	.	.	.	1	X	2	1	.	7	101	AUSTRALOPOLLIS OBSCURIS
.	.	.	.	X	.	X	.	.	.	102	PEROTRILETES MAJUS
.	.	.	.	1	.	.	1	2	1	103	TRICOLPITES GILLII
.	.	.	.	X	.	.	.	.	.	104	TRILOBOSPORITES TRIORETICULOSUS
.	.	.	.	.	1	1	.	.	3	105	CLAVIFERA TRIPLEX
.	.	.	.	.	.	X	.	2	.	106	CAMEROZONOSPORITES OHAIENSIS
.	.	.	.	.	.	X	.	.	.	107	CONTIGNISPORITES COOKSONIAE
.	.	.	.	.	.	4	10	4	4	108	PROTEACIDITES SPP
.	.	.	.	.	.	.	.	X	.	109	ORNAMENTIFERA SENTOSA
.	.	.	.	.	.	.	.	1	1	110	PHIMOPOLLENITES PANNOSUS
.	.	.	.	.	.	.	.	1	.	111	TRICOLPORITES APOXYEXINUS
5	1	4	17	.	2	.	.	1	2	112	BOTRYOCOCCUS
.	X	.	.	.	.	.	.	.	.	113	SCHIZOSPORIS PSILATUS
.	.	X	.	.	.	.	.	.	.	114	SCHIZOSPORIS RETICULATUS

SPECIES LOCATION INDEX

Index numbers are the columns in which species appear.

INDEX NUMBER	SPECIES
1	--- MICROPLANKTON CONTENT (%) ---
55	AEQUITRIRADITES SPINULOSUS
56	AEQUITRIRADITES TILCHAENSIS
57	AEQUITRIRADITES VERRUCOSUS
7	ALTERBIA ACUMINATUM
91	AMOSOPOLLIS CRUCIFORMIS
50	AMPHIDIADEMA DENTICULATA
92	APPENDICISPORITES DISTOCARINATUS
8	APTEA SP
58	ARAUCARIACITES AUSTRALIS
51	AUSTRALISPHAERA SP
101	AUSTRALOPOLLIS OBSCURIS
93	BALMEISPORITES HOLODICTYUS
112	BOTRYOCOCCUS
25	CALLAOISPHAERIDIUM ASYMMETRICUM
90	CALLIALASPORITES TURBATUS
106	CAMEROZONOSPORITES OHAIENSIS
45	CANNINGIA SPP
30	CASSICULOSPHAERIDIA GIANT
59	CERATOSPORITES EQUALIS
40	CHATANGIELLA VICTORIENSIS
9	CHLAMYDOPHORELLA AMBIGUA
60	CICATRICOSISPORITES AUSTRALIENSIS
61	CICATRICOSISPORITES HUGHESI
10	CIRCULODINIUM DEFLANDREI
105	CLAVIFERA TRIPLEX
107	CONTIGNISPORITES COOKSONIAE
62	CONTIGNISPORITES GLEBULENTUS
63	COPTOSPORA PARADOXA
64	COROLLINA TOROSA
26	CRIBROPERIDINIUM EDWARDSII
11	CRIBROPERIDINIUM SPP
65	CRYBELOSPORITES STRIATUS
66	CYATHIDITES AUSTRALIS
67	CYATHIDITES MINOR
68	CYCADOPITES FOLLICULARIS
27	CYCLONEPHELIUM MEMBRANIPHORUM
69	CYCLOSPORITES HUGHESI
94	DICTYOPHYLLIDITES
70	DICTYOTOSPORITES COMPLEX
71	DICTYOTOSPORITES SPECIOSUS
72	DILWYNITES GRANULATUS
41	EUCLADINIUM MADURENSE
12	EXOCHOSPHAERIDIUM PHRAGMITES
73	FALCISPORITES GRANDIS
74	FALCISPORITES SIMILIS
13	FLORENTINIA DEANEI
75	FORAMINISPORIS ASYMMETRICUS
76	FORAMINISPORIS DAILYI
77	FORAMINISPORIS WONTHAGGIENSIS
31	FROMEA FRAGILIS
32	GILLINIA HYMENOPHORA
95	GLEICHENIIDITES
42	HETEROSPHAERIDIUM CF LATEROBRACHIUS
4	HETEROSPHAERIDIUM CONJUNCTUM
14	HETEROSPHAERIDIUM HETEROCANTHUM
46	HETEROSPHAERIDIUM ROBUSTA
15	HETEROSPHAERIDIUM SOLIDA
28	HYSTRICHODINIUM PULCHRUM
96	INTERULOBITES INTRAVERRUCATUS
47	ISABELIDINIUM BELFASTENSE
33	ISABELIDINIUM CRETACEUM
52	ISABELIDINIUM ROTUNDATA
29	ISABELIDINIUM SP
53	ISABELIDINIUM TRIPARTITA
16	KIOKANSIUM POLYPES
17	KIOKANSIUM RECURVATUM
78	KLUKISPORITES SCABERIS
97	LAEVIGATOSPORITES OVATUS
79	LEPTOLEPIDITES VERRUCATUS
2	MICRHYSTRIDIUM
80	MICROCACHRYIDITES ANTARCTICUS
81	NEVESISPORITES VALLATUS
18	NUMMUS SP
34	ODONTOCHITINA COSTATA
35	ODONTOCHITINA CRIBROPODA
19	ODONTOCHITINA OPERCULATA
48	ODONTOCHITINA STUBBY
36	ODONTOCHITINIA PORIFERA
43	ODONTOCHITINIA TRIANGULARIS

81 HEVESISPORITES VALLATUS
18 NUMMUS SP
34 ODONTOCHITINA COSTATA
35 ODONTOCHITINA CRIBROPODA
19 ODONTOCHITINA OPERCULATA
48 ODONTOCHITINA STUBBY
36 ODONTOCHITINIA PORIFERA
43 ODONTOCHITINIA TRIANGULARIS
20 OLIGOSPHAERIDIUM COMPLEX
54 OLIGOSPHAERIDIUM PULCHERRIMUM
109 ORNAMENTIFERA SENTOSA
82 OSMUNDACIDITES WELLMANII
21 PALAEOHYSTRICHOSPHORA INFUSORIOIDES
37 PALAEOPERIDINIUM CRETACEUM
44 PARALECANIELLA
83 PERINOPOLLENITES ELATOIDES
102 PEROTRILETES MAJUS
110 PHIMOPOLLENITES PANNOSUS
98 PHYLLOCLADIDITES MAWSONII
84 PODOSPORITES MICROSACCATUS
108 PROTEACIDITES SPP
22 RECTANGULADINIUM SP
85 RETITRILETES AUSTROCLAVATIDITES
86 REWORKING - PERMIAN
113 SCHIZOSPORIS PSILATUS
114 SCHIZOSPORIS RETICULATUS
23 SPINIFERITES FURCATUS/RAMOSUS
87 STERIESPORITES ANTIQUASPORITES
5 SUBTILISPHAERA SP
24 TRICHODINIUM
103 TRICOLPITES GILLII
99 TRICOLPITES SPP
100 TRICOLPITES VARIVERRUCATUS
111 TRICOLPORITES APOXYEXINUS
104 TRILOBOSPORITES TRIORETICULOSUS
88 TRIPOROLETES RETICULATUS
6 TRITHYRODINIUM MARSHALLII
38 TRITHYRODINIUM PUNCTATE
49 TRITHYRODINIUM THICK PSILATE
39 TRITHYRODINIUM THICK RETICULATE
3 VERYHACHIUM
89 VITREISPORITES PALLIDUS

APPENDIX 4

APPENDIX

4. Petrolab Compositional Analysis Report

47 Woodforde Road, Magill,
South Australia, 5072
.O. Box 410,
agill, South Australia, 5072

PETROLAB

Fax: 364 1500
Telex: AA88214
Tel: (08) 364 1500
(08) 333 0787

Reservoir Fluid and Core Services, Laboratory Consulting and Analysis

A. C. N. # 008 130 667

Adelaide, August 9, 1994
P.O. Box 410
Magill, S.A. 5072

Bridge Oil Limited
#255 Elizabeth Street
Sydney
N.S.W. 2000

Subject: Compositional Analysis
Well : Mylor #1
File: B-94045

Attention: Mr. Phillip Reichardt

Dear Sirs,

Please find enclosed results of compositional analyses of Mylor #1. The appearance of the liquid was very transparent, being practically colourless.

It has been a pleasure to have been of service. Please do not hesitate in contacting us should you require any further information or if we can assist you in any other way.

Yours Sincerely,

Marcel Volant
Laboratory Manager

RECEIVED
'6 AUG 1994

PKR

PETROLAB

Company : Bridge Oil Limited
Well : Mylor # 1 File : B 94045

REPORT INDEX

Page

SUMMARY OF RESULTS

CONSTANT MASS DATA:

SATURATED LIQUID @ 150 °F AND 2775 PSIG:

Reservoir Temperature (°F)	:	150
Saturation Pressure (psig)	:	2775
Formation Volume Factor (Bbl/Bbl)	:	2.1351
Liquid density (gm/cc)	:	0.4997
Thermal Expansion @ 5000 psig (1/°F)	:	0.001464
(1/°C)	:	0.002635
Compressibility of saturated liquid		
@ 150 °F and 2775 psig (1/psi)	:	42.50 x 10^−6
Viscosity (cp)	:	0.258

FLASH DATA:

SATURATED LIQUID @ 150 °F AND 2301 PSIG:

Solution GOR (SCF/bbl)	:	1406
Formation Volume Factor (Bbl/Bbl)	:	1.8662
Liquid density (gm/cc)	:	0.5403
Specific Volume (ft3/lb)	:	0.02965
Viscosity (cp)	:	0.210

RESIDUAL LIQUID:

API Gravity @ 60 °F	:	61.9
Density @ 150 °F (gm/cc)	:	0.6888
Viscosity @ 150 °F (cp)	:	0.572

TRANSFER DETAILS

RUN # 2

Reservoir Pressure	:	2316 psia
Reservoir Temperature	:	150 °F
RFT Chamber #	:	RFS # AE – 1238
Capacity	:	2 3/4 Gallon
Depth	:	1702.3 mKB
Received	:	July 8, 1994
Opening Pressure	:	90 Psig @ 55 °F

Chamber compressed to 5000 psig with approximately 10480 cc"s of water behind the piston. Transferred 490 cc's into Petrolab cylinder L–104. Recovered another 2 cc's of water and 8 cc's of muddy filtrate. Chamber returned to Schlumberger Seaco Inc./GFR Resources,Victoria on July 13, 1994.

PETROLAB

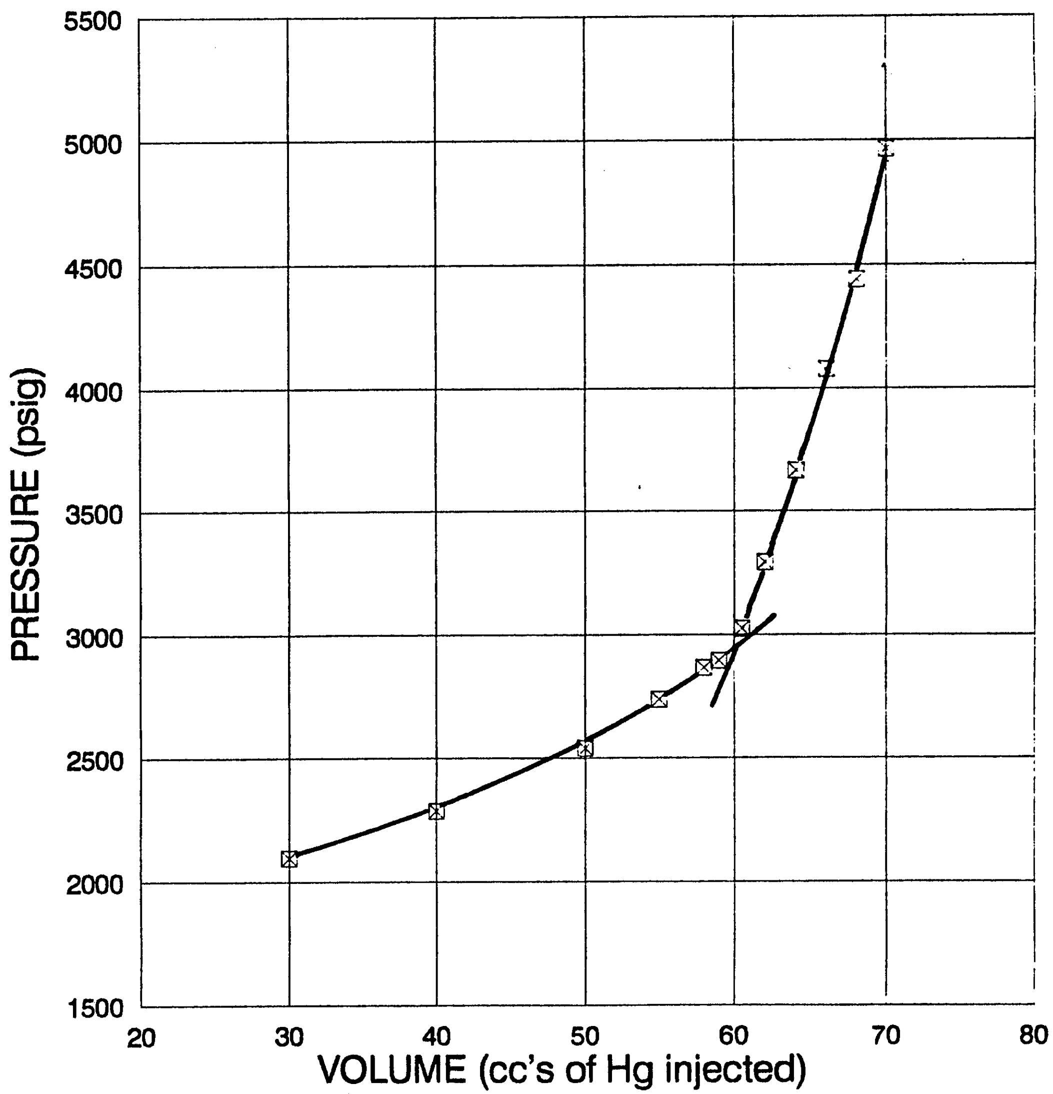
Bottom Hole Sample Validity Check

Sample # 1
Sampling Conditions

Reservoir Pressure :	2316 psia
Reservoir Temperature :	150 °F
Run # :	2
RFT Chamber # :	RFS # AE – 1238
Capacity :	2 3/4 Gallon
Depth :	1702.3 mKB
Opening Pressure :	90 psig @ 55 °F
Transferred into :	L–104

Volume (cc's)	Pressure (psig)
30.00	2095
40.00	2285
50.00	2540
55.00	2735
58.00	2865
59.00	2895
60.50	3025
62.00	3295
64.00	3665
66.00	4076
68.00	4440
70.00	4965

Saturation Pressure : 2950 psig @ 61 ° F



PETROLAB

COMPOSITIONAL ANALYSIS OF
Gas Equilibrated @ 2301 psig and 150 ° F
From RFS # AE – 1238 Cylinder # L–104

Component		Mol %	GPM
Hydrogen Sulphide	H2S	0.00	
Carbon Dioxide	CO2	0.12	
Nitrogen	N2	3.32	
Methane	C1	89.91	
Ethane	C2	1.62	0.434
Propane	C3	0.20	0.055
Iso–Butane	iC4	0.12	0.039
N–Butane	nC4	1.19	0.376
Iso–Pentane	iC5	0.69	0.253
N–Pentane	nC5	0.55	0.199
Hexanes	C6	0.97	0.377
Heptanes	C7	0.97	0.408
Octanes	C8	0.24	0.109
Nonanes	C9	0.06	0.030
Decanes	C10	0.04	0.022
Undecanes	C11	0.00	0.000
Dodecanes Plus	C12+	0.00	0.000
TOTAL		100.00	2.302

Pressure Base	: 14.696
Zsc	: 0.997
Mol Weight	: 19.77
Gas Gravity	: 0.684
Pc	: 652.3
Tc	: 369.1
Mol Weight C6+	: 93.4
Density C6+	: 0.6800
Mol Weight C7+	: 100.3
Density C7+	: 0.6895
Mol Weight C8+	: 112.6
Density C8+	: 0.7048
Mol Weight C11+	: --
Density C11+	: --
Mol Weight C12+	: --
Density C12+	: --
Heating Value (BTU/ft3)	
Gross	: 1157
Nett	: 1048
Wobbe Index	: 1399
Zpt *	: 0.845

(P)ressure : 2301 psig (T)emperature: 150 °F

(G)radient : 0.05748 psi/feet

(19.77 * 2315.7) / (0.845 * 10.73 * 610 * 144)

PETROLAB

COMPOSITIONAL ANALYSIS OF STABILISED LIQUID AT 2316 psia and 150 deg F

RFS # AE – 1238 Cyl. # L–104

Component		Stock Tank Liquid Mol %	Stock Tank Gas Mol %	Stabilised Liquid Mol %
Hydrogen Sulphide	H2S	0.00	0.00	0.00
Carbon Dioxide	CO2	0.00	0.16	0.10
Nitrogen	N2	0.00	1.51	0.90
Methane	C1	0.47	78.26	46.62
Ethane	C2	0.12	3.10	1.89
Propane	C3	0.08	0.56	0.37
Iso–Butane	iC4	0.20	0.53	0.40
N–Butane	nC4	2.92	5.27	4.32
Iso–Pentane	iC5	4.66	3.07	3.72
N–Pentane	nC5	4.77	2.41	3.37
Hexanes	C6	19.82	2.99	9.83
Heptanes	C7	36.47	1.87	15.94
Octanes	C8	10.63	0.25	4.47
Nonanes	C9	8.75	0.02	3.57
Decanes	C10	4.98	0.00	2.03
Undecanes	C11	2.36	0.00	0.96
Dodecanes Plus	C12+	3.76	0.00	1.51
TOTAL		100.00	100.00	100.00

Ratios

Molar Ratio	:	0.4068	0.5932	1.0000
Mass Ratio	:	0.7233	0.2767	1.0000
Liquid Ratio (bbl/bbl)	:	1.0000 @ SC	--	1.8520 @ PT*
Gas Liquid Ratio	:	1.0000 bbl @ SC	1406 SCF	--

Stream Properties

Molecular Weight	:	99.7	26.15	54.1
Density obs. (gm/cc)	:	0.7225 @ 60 °F	--	0.5403 @ PT*
Gravity (AIR = 1.000)	:	64.2 °API @ 60 °F	0.908	--
GHV (BTU/scf)	:	--	1533.0	--

Hexanes Plus Properties

Mol %	:	86.76	5.13	28.48
Molecular Weight	:	104.8	69.6	103.6
Density (gm/cc @ 60 °F)	:	0.7357	0.6746	0.7312
Gravity (°API @ 60 °F)	:	60.6	78.0	61.8

Heptanes Plus Properties

Mol %	:	66.94	2.14	12.54
Molecular Weight	:	85.6	40.7	83.6
Density (gm/cc @ 60 °F)	:	0.7481	0.5702	0.7431
Gravity (°API @ 60 °F)	:	57.5	116.4	58.7

Decanes Plus Properties

Mol %	:	11.10	0.00	4.50
Molecular Weight	:	155.9	--	155.9
Density (gm/cc @ 60 °F)	:	0.7979	--	0.7979
Gravity (°API @ 60 °F)	:	45.7	--	45.7

Undecanes Plus Properties

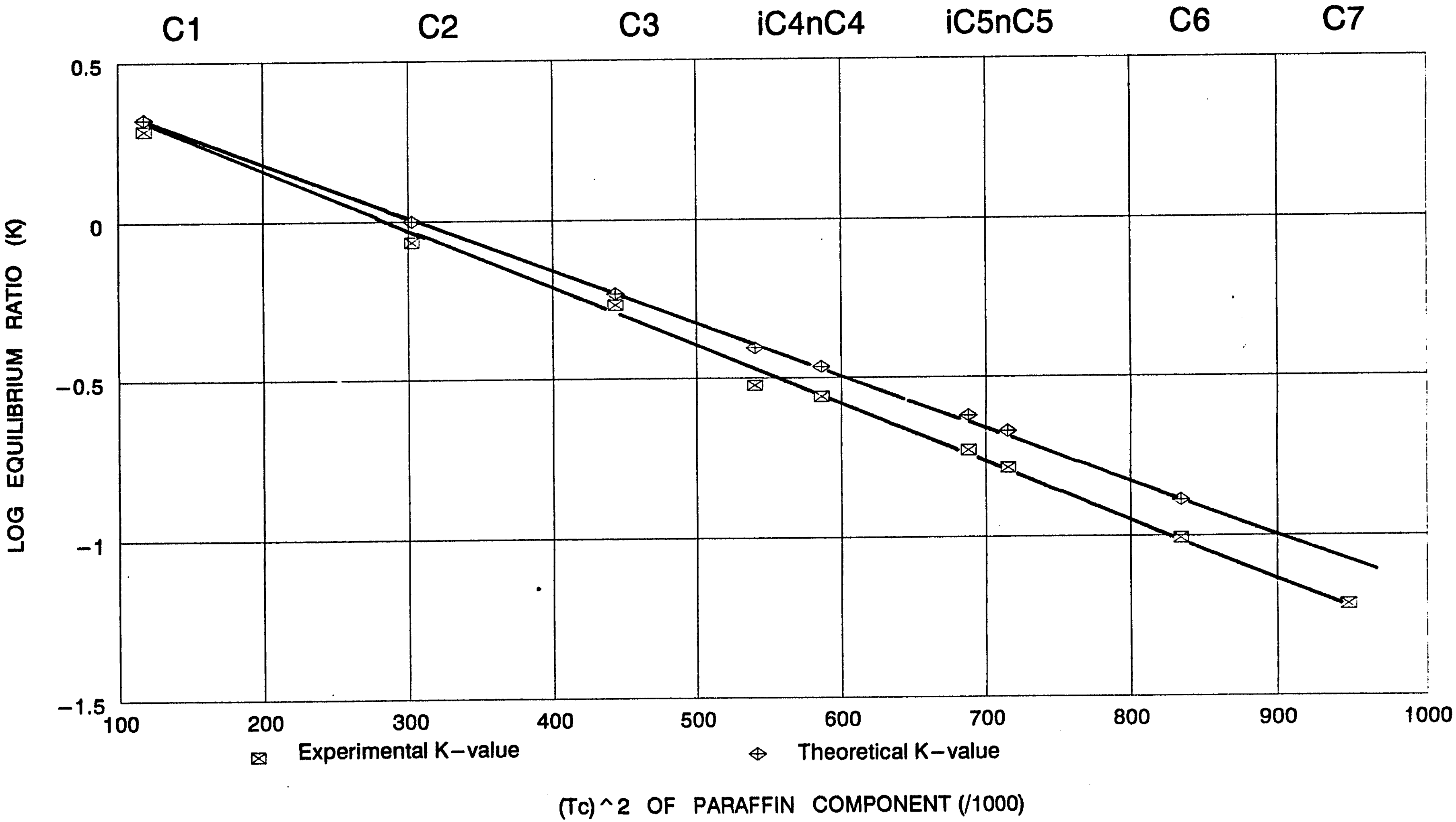
Mol %	:	6.12	0.00	2.47
Molecular Weight	:	173.8	--	173.8
Density (gm/cc @ 60 °F)	:	0.8109	--	0.8109
Gravity (°API @ 60 °F)	:	42.8	--	42.8

Dodecanes Plus Properties

Mol %	:	3.76	0.00	1.51
Molecular Weight	:	190.7	--	190.7
Density (gm/cc @ 60 °F)	:	0.8220	--	0.8220
Gravity (°API @ 60 °F)	:	40.5	--	40.5

* (P)ressure: 2301 psig * (T)emperature: 150 °F

SAMPLES QUALITY CHECK
EQUILIBRIUM LIQUID AN GAS AT 2301 psig & 150 °F



PETROLAB

CONSTANT MASS STUDY
@ 150 °F

Pressure (psig)	Relative Volume (V/Vsat) (1)	Liquid Compressibility (x10^-6)(psig^-1) (2)	Y Function (3)	Formation Volume Factor (Bo) (4)	Liquid Viscosity (cp)
5000	0.9434	18.50		2.0143	0.258
4552	0.9517	20.65		2.0321	0.242
4086	0.9615	23.25		2.0529	0.229
3669	0.9715	26.32		2.0743	0.215
3254	0.9831	30.75		2.0990	0.203
3047	0.9897	34.15		2.1131	0.195
2832	0.9976	40.15		2.1301	0.190
2775 *	1.0000	42.50		2.1351	0.189
2685	1.0161		2.350	2.0869	0.191
2559	1.0427		1.978	1.9758	0.197
2435	1.0731		1.826	1.9098	0.201
2301 **	1.1104		1.739	1.8662	0.210
2229	1.1332		1.711	1.8385	0.211
2026	1.2077		1.625	1.7798	0.222
1862	1.2820		1.572	1.7390	0.230
1607	1.4352		1.505	1.6702	0.245
1416	1.5893		1.474	1.6286	0.260
1262	1.7522		1.450	1.5938	0.270
1018	2.1165		1.402	1.5459	0.290
897	2.3769		1.397	1.5206	0.300
700	3.0081		1.358	1.4762	0.321
630	3.3355		1.348	1.4578	0.330
0				1.0613	0.572

* Saturation pressure
** Reservoir pressure

(1) Barrels at indicated pressure per barrel at saturation pressure

(2) Liquid Compressibility = − (1/V) * (dV/dP)

(3) Y Function = (Psat − P) / (P)*(V/Vsat−1)

(4) Barrels of liquid at indicated pressure and temperature per barrel of residual liquid at 60 °F.

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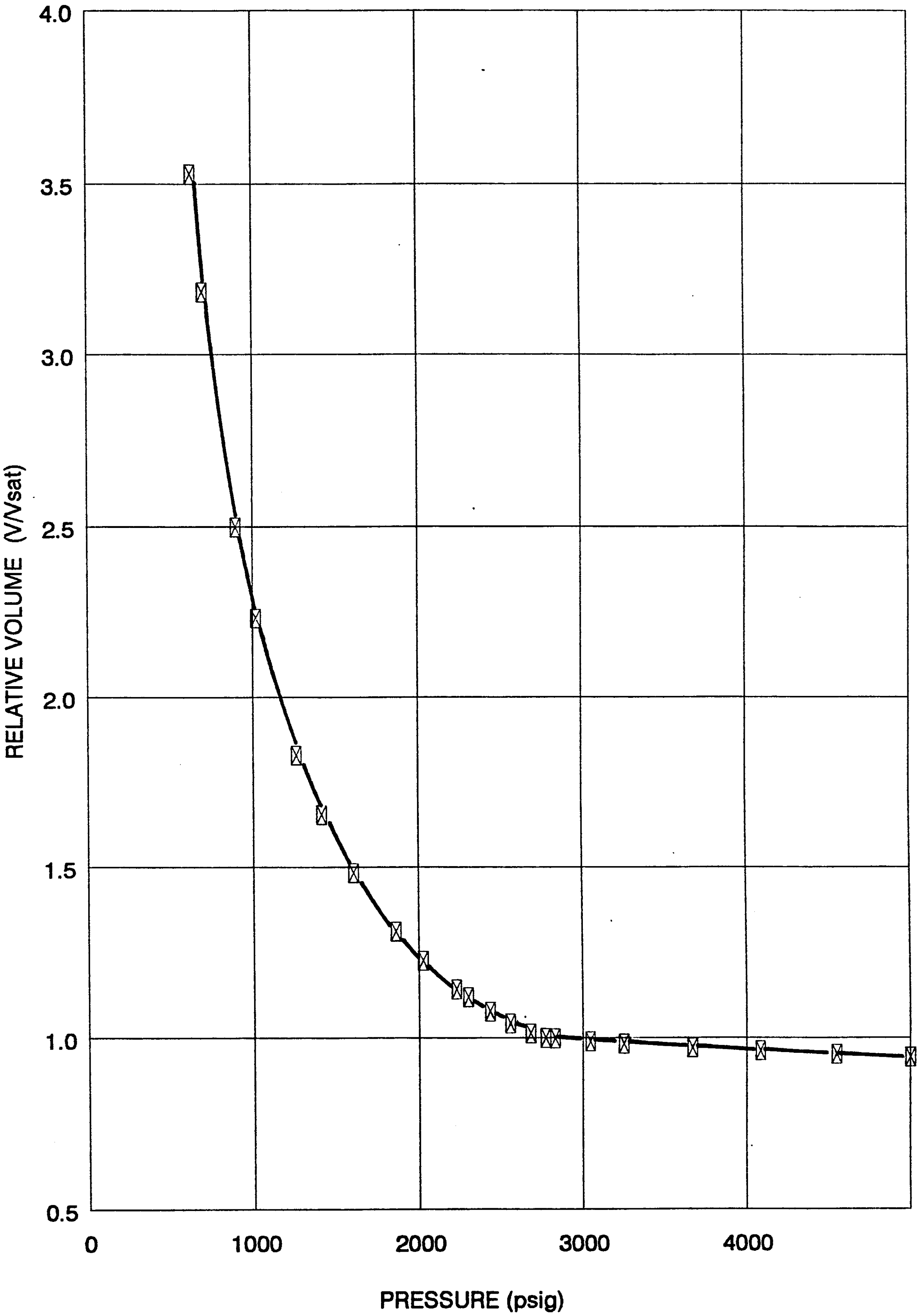
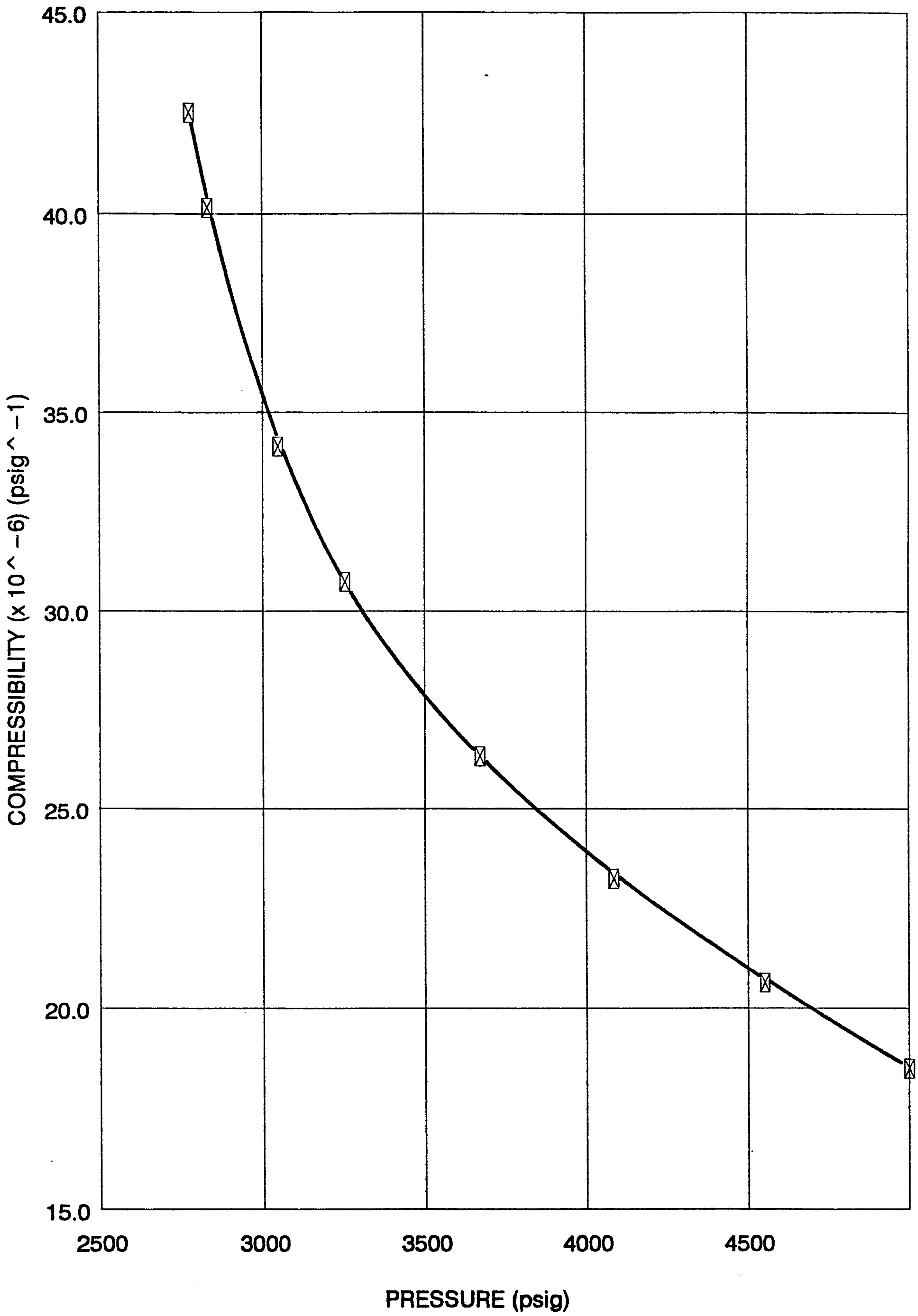
Company: Bridge Oil Limited	Page: 8 of 12
Well: Mylor # 1	File: B 94045

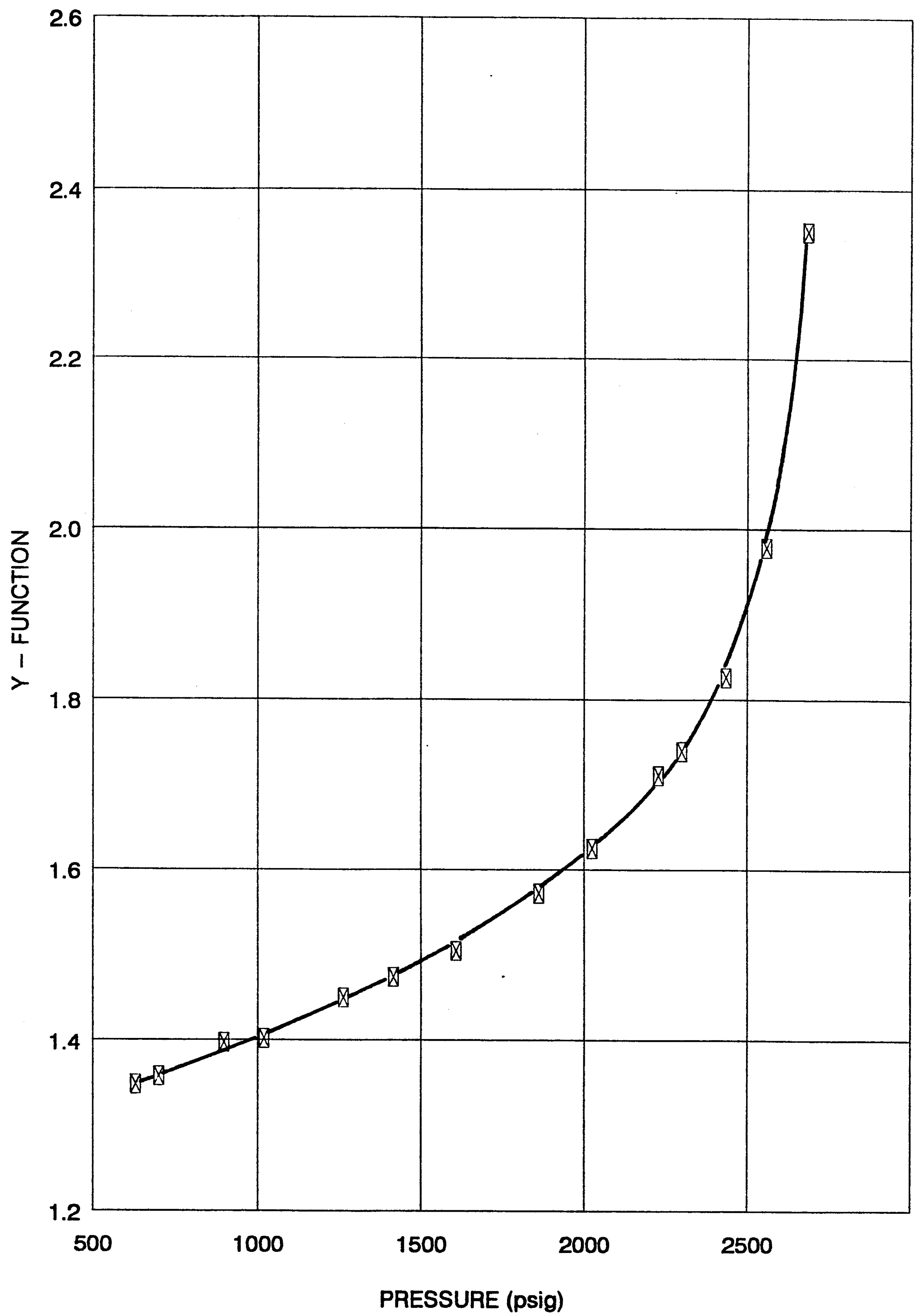
RELATIVE VOLUME



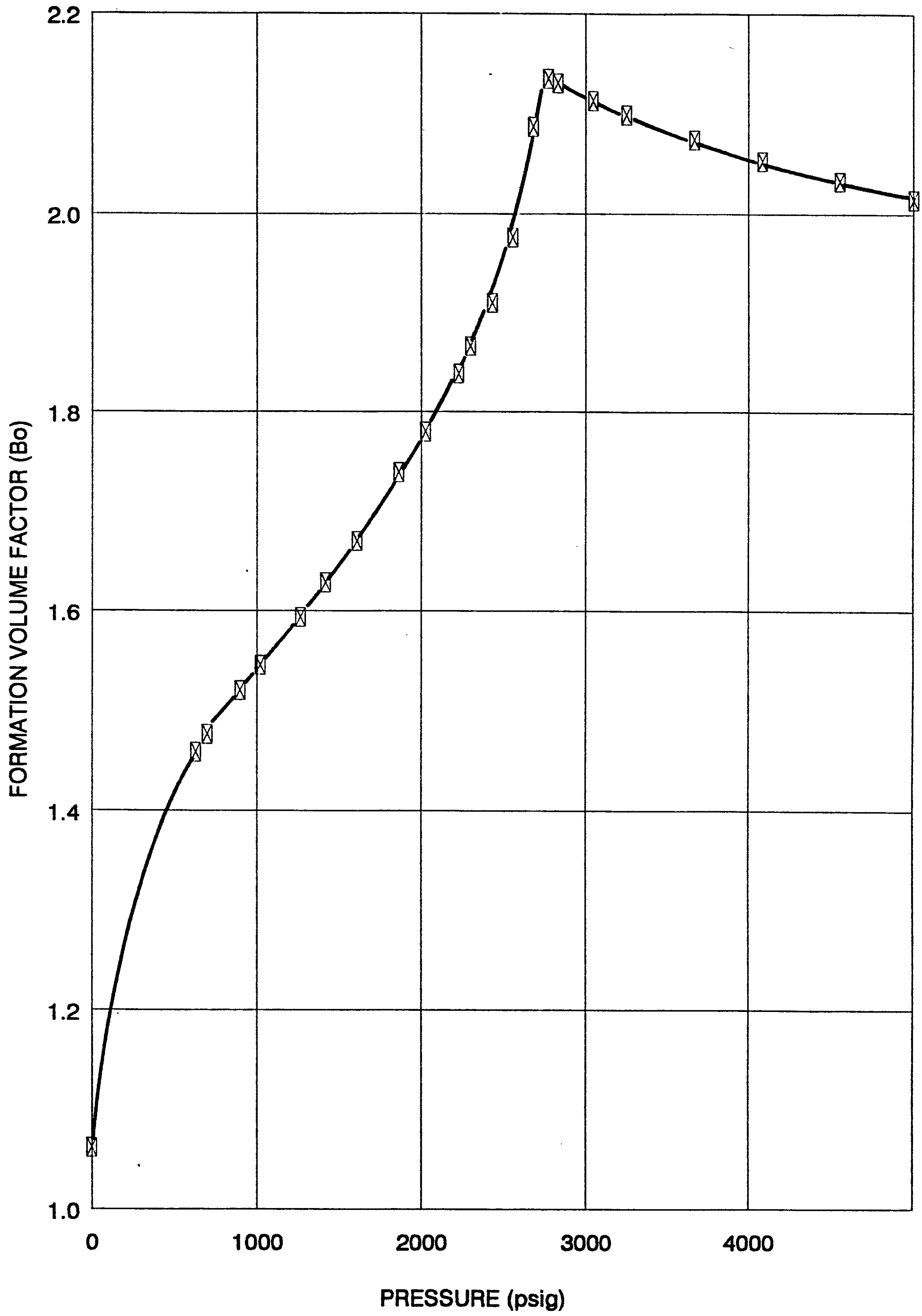
LIQUID COMPRESSIBILITY



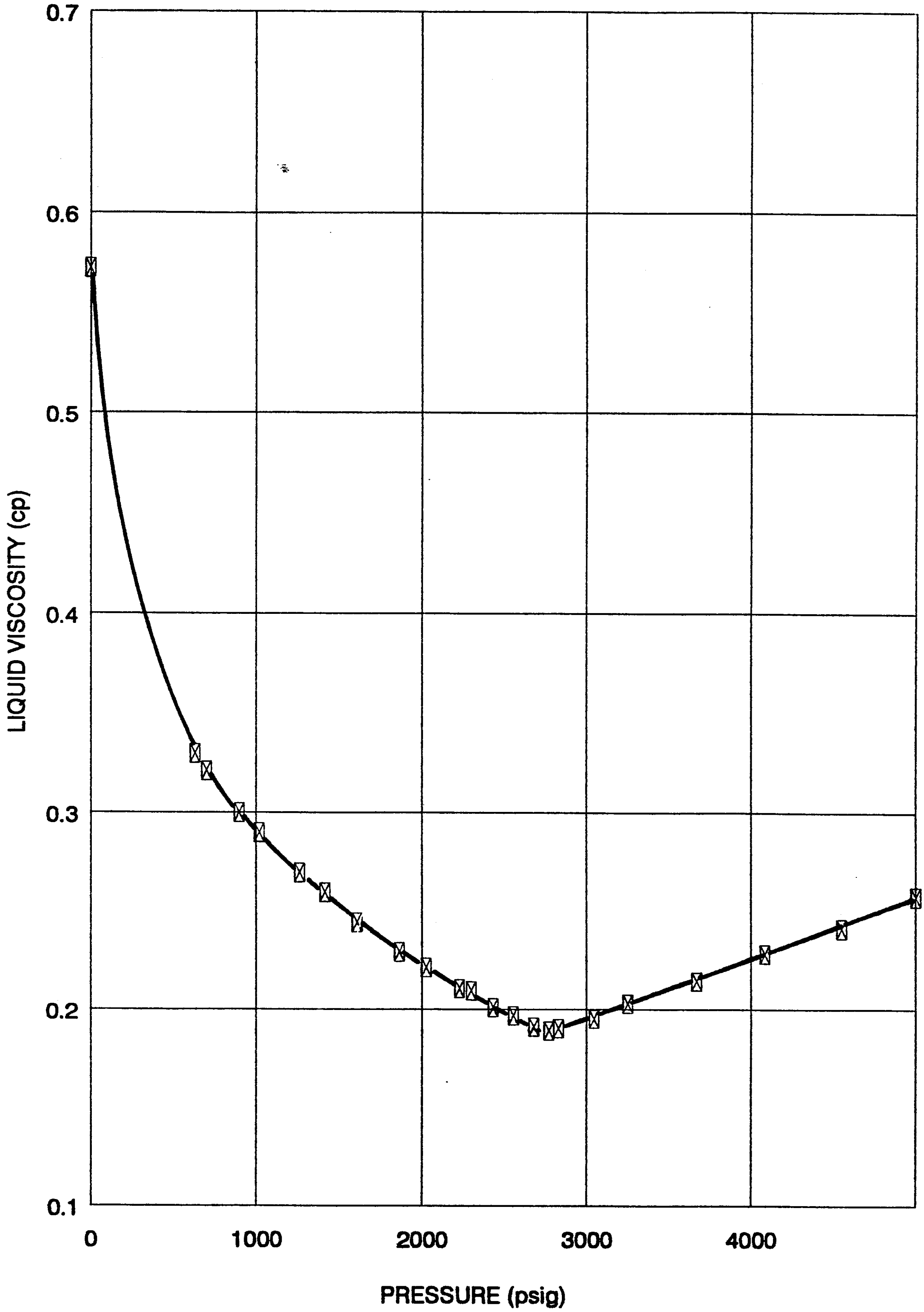
Y – FUNCTION


2.6
2.4
2.2
2.0
1.8
1.6
1.4
1.2
Y – FUNCTION
500
1000
1500
2000
2500
PRESSURE (psig)

LIQUID VOLUME FACTOR



LIQUID VISCOSITY



APPENDIX 5

APPENDIX

5. Amdel Geochemical Evaluation of Core, Cuttings and Condensate Samples from Mylor #1

amdel

GEOCHEMICAL EVALUATION OF CORE, CUTTINGS AND CONDENSATE

SAMPLES FROM

MYLOR-1

OTWAY BASIN, VICTORIA

REPORT LQ3108 FOR

BRIDGE OIL LIMITED

BY

SCOTT WYTHE

BRIAN WATSON

Amdel Limited
A.C.N. 008 127 802

Petroleum Services
PO Box 338
Torrensville SA 5031

Telephone: (08) 379 9888
Facsimile: (08) 379 6623

18 October 1994

Bridge Oil Limited
PO Box A1195
SYDNEY SOUTH NSW 2000

Attention: Barry Goldstein

REPORT LQ3108

CLIENT REFERENCE: PO 4254 & 7396

WELL NAMES: Mylor-1

MATERIAL: Core, Cuttings and Condensate samples

WORK REQUIRED: Source Rock and Oil Geochemistry

Please direct technical enquiries regarding this work to the signatory below under whose supervision the work was carried out.

Brian L. Watson
Manager
Petroleum Services

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1. Analytical Procedures
2. Vitrinite Reflectance Values and Histograms
3. Photomicrographs
4. GC-MS of Branched/Cyclic Alkanes
5. GC-MS of Aromatic Hydrocarbons

1. INTRODUCTION

Three (3) cuttings samples and four (4) sidewall core samples were received from Mylor-1 for TOC analysis and Rock-Eval Pyrolysis along with vitrinite reflectance and organic petrological analysis. In addition two (2) core samples and one (1) DST-1 (1665.7 - 1684m KBD) condensate sample from the same well were received for oil geochemical analysis. An RFT oil was also submitted by Dr.D.M.McKirdy for gasoline range analysis and gas chromatography. Results of analyses on this RFT sample have been reported to Dr. McKirdy and will only be discussed briefly here. This report is a formal presentation of results forwarded as they became available.

2. ANALYTICAL PROCEDURES

The analytical procedures used in this study are provided in Appendix 1.

3. RESULTS

Analytical data is presented in this report as follows:

Analysis	Table	Figure
Vitrinite Reflectance Analysis and Organic Petrology	1-4	1 Appendices 2 & 3
Rock-Eval Pyrolysis	5	2
Gasoline Range Analysis	6	3 - 5
GCs of Extracted Hydrocarbons	7	6 - 9
GC-MS of branched/cyclic hydrocarbons	8	10 - 12 Appendix 4
GC-MS of aromatic hydrocarbons	9	13 Appendix 5

4. INTERPRETATION

4.1 Source Rock Geochemistry

4.1.1 Maturity

Measured vitrinite reflectance values range from 0.40-0.53% in the samples analysed (Table 1). Figure 1 indicates that the sedimentary section intersected in Mylor-1 should be sufficiently mature for the generation of light oil/condensate from thermally labile liptinites (resinite, suberinite and bituminite) below approximately 1300 metres (VR = 0.45%). The maturity threshold for significant gas generation from terrestrial woody herbaceous kerogen (VR = 0.55%) occurs at approximately 2500 metres in this location. Below approximately 4000 metres the sedimentary interval is mature for the generation of liquid hydrocarbons from the less thermally labile liptinites (VR > 0.7%).

Rock-Eval T_{max} values and Hydrogen Indices (Table 5, Figure 2) suggest that the samples are immature to marginally mature (VR_{equiv}=0.4-0.5%) which is in agreement with the measured vitrinite reflectance data.

4.1.2 Source Richness

Organic richness ranges from poor to fair in the samples studied (TOC = 0.14 - 3.06%; Table 5). Samples with fair organic richness occur in the interval 1386 - 1839 metres depth.

Source richness for the generation of hydrocarbons is generally poor ($S_1 + S_2$ = 0.33 - 0.60 kg of hydrocarbons/tonne; Table 5) with the exception of the SWC from 1744 metres depth which has fair source richness ($S_1 + S_2$ = 2.36 kg of hydrocarbons/tonne; Table 5).

The likely presence of migrated oil is indicated by the high Production Index (PI = 0.37) in the sample from 1386 - 1389 metres depth.

4.1.3 Kerogen Type and Source Quality

Hydrogen Index and T_{max} values for the five samples plotted in Figure 2 indicate that these sediments contain organic matter which has bulk compositions ranging from Type III to Type IV kerogen.

Maceral group proportions derived from organic petrology analyses on these samples (Table 2) are consistent with the bulk compositions indicated by the Rock-Eval analyses. Samples consist largely of inertinite and have low to moderate vitrinite and liptinite contents (up to 15%).

Liptinite contents of up to 10% suggest the possibility of minor oil generation from samples from 1744 and 660 metres depth on maturity.

These indications would be more definitively assessed by pyrolysis - GC analyses.

The liptinite macerals present suggest a terrestrial environment of deposition. Lamalginite and phytoplankton are indicative of lacustrine facies (Tables 3 and 4).

4.2 Oil Geochemistry

4.2.1 Maturity

Aromatic maturity indicators for the DST-1 condensate (1665.7 - 1684m KBD) indicate that the sample was generated and expulsed from a mature source interval (Parameters A, C, E and F, Table 9). The equivalent vitrinite reflectance value of 0.83% (Parameter E, Table 5) is significantly higher than the measured vitrinite reflectance value at this depth (VR ≈ 0.5%, Table 1) indicating that the condensate has migrated some distance from depth.

Maturities indicated for this sample by saturated biomarker maturity parameters are less precise than the aromatic derived biomarker ratios. These parameters (ie, C_{29} steranes and isosteranes - Biomarker Parameters 4 & 6, C_{27} diasteranes - Biomarker Parameter 5, C_{27}, C_{30} & C_{32} hopanes - Biomarker Parameters 9 - 11, C_{30} moretanes -Biomarker Parameter 12) generally support a moderate maturity for the condensate.

The two core extracts are from core just below the interval tested in DST-1 and along with the RFT oil have isoprenoid/n-alkane ratios (Table 7, Figure 9) very similar to that of the DST-1 condensate. This implies a similar maturity for all four of the samples.

4.2.2 Source Affinity

Pristane/phytane ratios (Table 7, Figure 10) for all four of the samples studied are indicative of generation from sources deposited in highly oxic conditions. Isoprenoid/n-alkane ratios suggest a similar higher plant source for the two extracts, the DST-1 condensate and the RFT sample.

Gasoline range analysis showed that the C_5-C_7 fractions of both the DST-1 condensate and the RFT sample have relatively high proportions of cyclic compounds which are most abundant in land plant derived organic matter. Differences between the gasoline range ratios for these two samples is likely to be due to more significant light end loss in the DST-1 sample.

GC-MS of branched/cyclic alkanes for the condensate has sterane and diasterane distributions (m/z 217, 218, 259; Table 8, Figures 10 & 12, Appendix 4) which are influenced by both C_{27} homologues of algal/bacterial origin and C_{29} homologues of higher plant origin (Biomarker parameters 1-3, Table 8). This suggests that the extracts contain either a mix of oils of different origin or an oil derived from a mixed source. The sample may therefore have been deposited in a near shore environment with both marine and terrestrial input.

Diterpanes and labdanes (m/z 123) are derived from sources containing resinite. Resinite is formed from higher plant resins and its presence implies that the source contains a component of terrestrial kerogen. These compounds are present in the DST-1 condensate sample.

Tricyclic and tetracyclic terpane compounds (m/z 191) are reasonably abundent in the condensate. C_{19} and C_{20} tricyclics which may be evidence of a higher plant source are present though not abundant in the sample. A substantial amount of the higher plant marker C_{24} tetracyclic terpane is however present in the sample.

The ratios of 1-methylphenanthrene/9-methylphenanthrene and 1,2,5-trimethylnaphthalene/1,3,6-trimethylnaphthalene (Figure 13) has been used to indicate source input from Araucariacean derived plant resins (trees from the Kauri pine group) which were most prominent in Early to Middle Jurassic times. The lack of Araucariacean source input of these compounds implies that these resins were not significant components of the precursor organic matter of the DST-1 condensate. However, this does not preclude the possibility that this sample was generated from a source of Jurassic/Cretaceous age.

4.3 Post Pooling Alteration and Migration

No evidence of significant biodegradation was seen for any of the samples analysed however isoprenoid/n-alkane ratios (Table 7, Figure 9) and gasoline range heptane values (Table 6, Figure 4) suggest that both the DST and RFT samples along with possibly the extracts may have been subjected to minor biodegradation. The very low aromatic contents of the DST-1 and RFT samples indicate that both these samples have undergone significant water washing.

Figure 13 along with differences between the aromatic maturity determination and the maturity of local sediments indicate that the DST-1 condensate is likely to have undergone significant migration since generation from its source interval(s).

5. CONCLUSIONS

5.1 Measured vitrinite reflectance values range from 0.40-0.53% in the samples analysed. Rock-Eval T_{max} values and Hydrogen Indices are in agreement with the vitrinite reflectance data.

5.2 Organic richness ranges from poor to fair in the samples studied with the samples in the interval 1386 - 1839 metres depth having fair organic richness. Source richness for the generation of hydrocarbons however is poor with the exception of the SWC from 1744 metres depth which has fair source richness.

5.3 Samples examined contain organic matter which has bulk compositions ranging from Type III to Type IV kerogen.

5.4 Maceral analyses showed liptinite contents of up to 10% suggesting minor oil generative potential. Liptinite macerals suggest a terrestrial environment with some lacustrine facies.

5.5 Aromatic maturity indicators for the DST-1 condensate indicate that the sample was generated and expulsed from mature source interval(s) (VR_{equiv}=0.83%). This value is significantly higher than the measured vitrinite reflectance value at this depth (VR = 0.50%) indicating that the oil has migrated some distance from depth. Saturated biomarker maturity indicators and alkane ratios support a similar maturity level for this sample.

5.6 Various aspects of the molecular composition of the DST-1 condensate indicates significant input of both higher plant and algal derived kerogen into the precursor organic matter suggesting the possibility of a near shore environment of deposition.

5.7 All of the samples appear to have been subjected to significant water washing and possibly a minor amount of biodegradation also.

TABLE 1

SUMMARY OF VITRINITE REFLECTANCE MEASUREMENTS, MYLOR-1

Depth (m)	Mean Maximum Reflectance (%)	Standard Deviation	Range	Number of Determinations
650-660	0.40	0.01	0.39-0.40	2
840-850	0.42	0.02	0.40-0.44	3
1386-1389	0.48	0.02	0.43-0.52	20
1550	0.53	0.02	0.51-0.57	6
1744	0.47	0.04	0.40-0.52	16
1835	0.50	0.04	0.43-0.57	18
1901	0.53	0.01	0.52-0.55	6

TABLE 2

MACERAL GROUP PROPORTIONS

Depth (m)	Percentage of		
	Vitrinite	Inertinite	Liptinite
650-660	5	85	10
840-850	<5	>90	<5
1386-1389	5-10	90	<5
1550	<5	90	5
1744	10-15	80	5-10
1835	<5	90	5
1901	<5	90-95	<5

TABLE 3

ORGANIC MATTER TYPE AND ABUNDANCE

Depth (m)	Relative Maceral Group Proportions	Estimated Volume of		Exinite Macerals
		DOM (%)	Liptinite	
650-660	I>>L>V	~0.5	Ra-Vr	Bmite, Res, Lama
840-850	I>>V~L	<0.5	Ra-Vr	Lipto
1386-1389	I>>V>L	1-2	Ra-Vr	Spo
1550	I>>L>V	~1	Ra	Lipto, Cut, Res, Phyto
1744	I>>V>L	2-3	Ra	Cut, Lama, Lipto, Spo, Res, Phyto
1835	I>>L>V	0.5-1	Ra-Vr	Lama, Lipto, Phyto
1907	I>>V~L	~0.5	Vr	Lipto

TABLE 4

LIPTINITE MACERAL ABUNDANCE AND FLUORESCENCE CHARACTERISTICS

Depth (m)	Liptinite Macerals	Lithology/Comments
650-660*	Bmite (Ra; dO) Res (Vr; mY-mO), Lama (Vr; mO)	Cheifly sandstone with minor shale and carbonaceous shale.
840-850*	Lipto (Ra-Vr; mO)	Chiefly sandstone with minor shale.
1386-1389*	Spo (Ra-Vr; mO)	Chiefly shale with minor siltstone.
1550*	Lipto (Ra; mY-mO), Cut (Vr; mO), Res (Vr; iY), Phyto (Tr; mY)	Chiefly shale.
1744*	Cut (Ra; mO), Lama (Ra-Vr; mY-mO), Lipto (Ra-Vr; mO) Spo (Vr; mO), Res (Vr, mY), Phyto (Tr; mO)	Chiefly shale.
1835*	Lama (Ra-Vr; mO), Lipto (Ra-Vr; mO), Phyto (Vr; ?mY).	Chiefly shale.
1901*	Lipto (Vr; mO)	Cheifly siltstone.

* Liptinite macerals are generally slightly to moderately oxidised.

TABLE 5

AMDEL PETROLEUM SERVICES

Rock–Eval Pyrolysis 30/08/94

Client: *Bridge Oil Limited*

Well: *Mylor–1*

Depth (m)	Tmax	S1	S2	S3	S1+S2	PI	S2/S3	PC	TOC	HI	OI
650–660									0.14		
840–850									0.20		
1386–1389	420*	0.12	0.21	1.58	0.33	0.37	0.13	0.02	1.53	13	103
1550 SWC 25	430	0.05	0.47	1.22	0.52	0.10	0.39	0.04	1.45	32	84
1744 SWC 12	434	0.20	2.16	2.11	2.36	0.08	1.02	0.19	3.06	70	69
1839 SWC 4	440*	0.06	0.54	0.31	0.60	0.10	1.74	0.05	0.61	88	51
1901 SWC 3									0.29		

*Estimated hand measured value

TABLE 6

amdel

PETROLEUM SERVICES
GASOLINE RANGE ANALYSIS

JOB NO: *LQ3108*

CLIENT: *Bridge Oil Limited*

WELL: *Mylor-1 DST-1 Condensate*

Compound	Normal (%)	Branched (%)	Cyclic (%)	Aromatic (%)
2-Methylbutane		0.19		
n-Pentane	0.56			
2,2-Dimethylbutane		0.16		
Cyclopentane			0.00	
2,3-Dimethylbutane		0.59		
2-Methylpentane		2.36		
3-Methylpentane		1.62		
n-Hexane	6.37			
2,2-Dimethylpentane		0.61		
Methylcyclopentane			4.18	
2,4-Dimethylpentane		0.97		
2,2,3-Trimethylbutane		0.22		
Benzene				0.00
3,3-Dimethylpentane		0.45		
Cyclohexane			9.21	
2-Methylhexane		5.02		
2,3-Dimethylpentane		1.80		
1,1-Dimethylcyclopentane			1.03	
3-Methylhexane		4.85		
Trans-1,3-Dimethylcyclopentane			1.68	
Cis-1,3-Dimethylcyclopentane			1.87	
3-Ethylpentane		0.00		
Trans-1,2-Dimethylcyclopentane			2.68	
n-Heptane	17.24			
Methylcyclohexane			35.76	
Ethylcyclopentane			0.50	
Toluene				0.08
Total Percentages	**24.17**	**18.84**	**56.91**	**0.08**

Gasoline Range Parameters

Parameter	Specificity	Value
n-hexane/methylcyclopentane	maturity/biodegradation	1.52
n-heptane/methylcyclohexane	maturity/biodegradation	0.48
3-methylpentane/benzene	water washing	0.00
cyclohexane/benzene	water washing	0.00
methylcyclohexane/toluene	water washing	436.90
isopentane/normal pentane	maturity/biodegradation	0.34
3-methylpentane/n-hexane	biodegradation	0.26
isoheptane value *	maturity	1.58
heptane value *	maturity	21.24

(* from Thompson, 1983)

TABLE 7

C_{12+} BULK COMPOSITION AND ALKANE RATIOS, MYLOR-1

Sample Depth (m)	Extract Yield (ppm)	Alkane Ratios			
		Np/Pr	Pr/Ph	Pr/n-C_{17}	Ph/n-C_{18}
1685.74-1685.86	71.93	0.44	6.3	0.44	0.08
1702.9	1429	0.42	6.2	0.47	0.08
DST-1	-	0.50	8.4	0.41	0.08
RFT	-	0.42	7.4	0.41	0.09

Np = norpristane
Pr = pristane
Ph = phytane

n-C_{17} = n-heptadecane
n-C_{18} = n-octadecane

TABLE 8

BIOMARKER PARAMETERS OF SOURCE, MATURITY, MIGRATION AND BIODEGRADATION, MYLOR-1, DST-1

Steranes							Terpanes							Acyclic Alkanes		
Parameter																
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
38:21:41	1.08	1.23	1.16	1.61	1.59	0.51	nd	nd	0.56	0.46	1.54	0.10	nd	8.4	0.41	0.08

nd = not determined

KEY TO BIOMARKER PARAMETERS OF SOURCE, MIGRATION AND BIODEGRADATION

Parameter	Derivation*	Specificity
1	C_{27}:C_{28}:C_{29} 5α(H)14α(H)17α(H) 20R steranes	Source
2	C_{29} 5α(H)14α(H)17α(H) 20R sterane/C_{27} 5α(H)14α(H)17α(H) 20R sterane	Source
3	C_{29} 13β(H)17α(H) 20R diasterane/C_{27} 13β(H)17α(H) 20R diasterane	Source
4	C_{29} 5α(H)14α(H)17α(H) 20S sterane/C_{29} 5α(H)14α(H)17α(H) 20R sterane	Maturity, Biodegradation
5	C_{27} 13β(H)17α(H) 20S diasterane/C_{27} 13β(H)17α(H) 20R diasterane	Maturity
6	C_{29} 5α(H)14β(H)17β(H) 20R sterane/C_{29} 5α(H)14α(H)17α(H) 20R sterane	Maturity, Migration
7	C_{29} 13β(H)17α(H) 20R+20S diasteranes/C_{29} 5α(H) steranes	Migration, Source
8	18α(H)-30-norneohopane (C_{29}Ts)/C_{29} 17α(H) hopane + C_{29}Ts	Maturity, Source
9	17α(H) diahopane/18α(H)-30-norneohopane (C_{30}*/C_{29}TS)	Source, Maturity
10	C_{27} 18α(H)-22,29,30-trisnorhopane (Ts)/C_{27} 17α(H)-22,29,30-trisnorhopane (Tm) + Ts	Maturity, Source
11	T_s/C_{30} 17α(H)21β(H) hopane	Maturity
12	C_{32} 17α(H)21β(H) 22S homohopane/C_{32} 17α(H)21β(H) 22R homohopane	Maturity
13	C_{30} 17β(H)21α(H) moretane/C_{30} 17α(H)21β(H) hopane	Maturity
14	C_{29} 17α(H)-25-norhopane/C_{29} 17α(H)-30-norhopane	Biodegradation
15	pristane/phytane	Source
16	pristane/n-heptadecane	Source, Biodegradation, Maturity
17	phytane/n-octadecane	Source, Biodegradation, Maturity

* Ratios calculated from peak areas as follows:

Parameters	1-7	m/z = 217, 218, 259 mass fragmentograms
Parameters	8 - 14	m/z = 191 mass fragmentogram
Parameters	15 - 17	capillary gas chromatogram of alkanes or whole oil/extract

TABLE 9

AROMATIC MATURITY DATA, MYLOR-1 DST-1 CONDENSATE

MPI	MPR	DNR	MPDF	VR CALC (%)					
				A	B	C	D	E	F
0.874	1.300	5.468	0.512	0.92	1.78	1.05	3.41	0.83	0.98

KEY TO AROMATIC MATURITY INDICATORS

Methylphenanthrene index (MPI), methylphenanthrene ratio (MPR), dimethylnaphthalene ratio (DNR) and calculated vitrinite reflectance (VR_{calc}) are derived from the following equations (after Radke and Welte, 1983; Radke *et al*, (1984):

$$MPI = \frac{1.5(2\text{-}MP + 3\text{-}MP)}{P + 1\text{-}MP + 9\text{-}MP}$$

$$VR_{calc}\ (a) = 0.6\ MPI + 0.4\ (\text{for } VR < 1.35\%)$$

$$VR_{calc}\ (b) = -0.6\ MPI + 2.3\ (\text{for } VR > 1.35\%)$$

$$MPR = \frac{2\text{-}MP}{1\text{-}MP}$$

$$VR_{calc}\ (c) = 0.99\ \log_{10} MPR + 0.94 (VR = 0.5\text{-}1.7\%)$$

$$DNR = \frac{2{,}6\text{-}DMN + 2{,}7\text{-}DMN}{1{,}5\text{-}DMN}$$

$$VR_{calc}\ (d) \quad 0.46\ DNR + 0.89\ (\text{for } VR = 0.9\text{-}1.5\%)$$

Where P = phenanthrene
1-MP = 1-methylphenanthrene
2-MP = 2-methylphenanthrene
3-MP = 3-methylphenanthrene
9-MP = 9-methylphenanthrene
1,5-DMN = 1,5-dimethylnaphthalene
2,6-DMN = 2,6-dimethylnaphthalene
2,7-DMN = 2,7-dimethylnaphthalene

Peak areas measured from m/z 156 (dimethylnaphthalene), m/z 178 (phenanthrene) and m/z 192 (methylphenanthrene) mass fragmentograms of diaromatic and triaromatic hydrocarbon fraction isolated by thin layer chromatography.

Recalibration of the methylphenanthrene index using data from a suite of Australian coals has given rise to another equation for calculated vitrinite reflectance (after Boreham *et al*, 1988):

$$VR_{calc}\ (e) = 0.7\ MPI + 0.22\ (\text{for } VR < 1.7\%)$$

The methylphenanthrene distribution ratio (MPDF) and calculated vitrinite reflectance VR_{calc} (f) is derived from the following equation (after Kvalheim *et al*, 1987):

$$MPDF = \frac{(2\text{-}MP + 3\text{-}MP)}{(2\text{-}MP + 3\text{-}MP + 1\text{-}MP + 9\text{-}MP)}$$

$$VR_{calc}\ (f) = -0.166 + 2.242\ MPDF$$

FIGURE 1

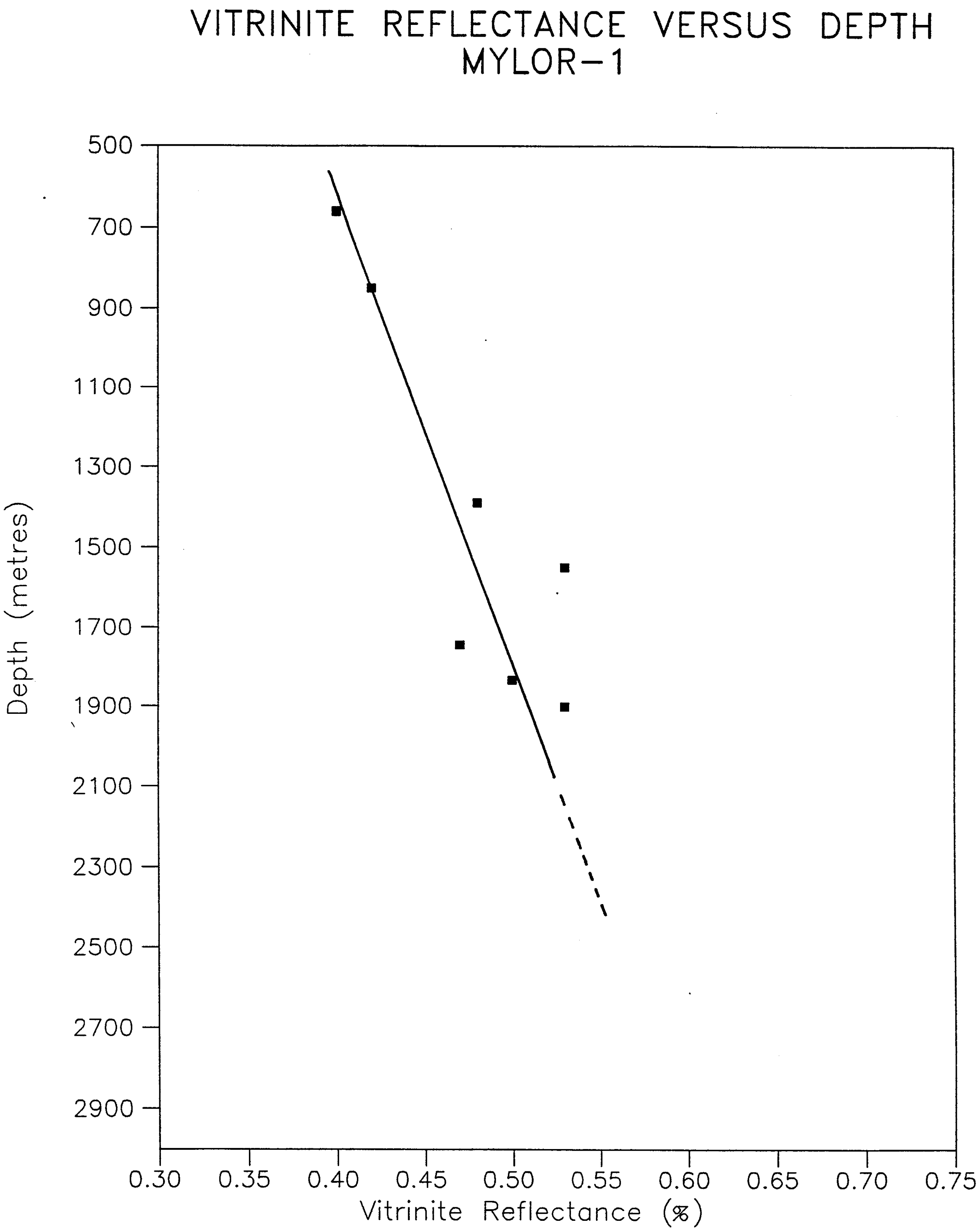
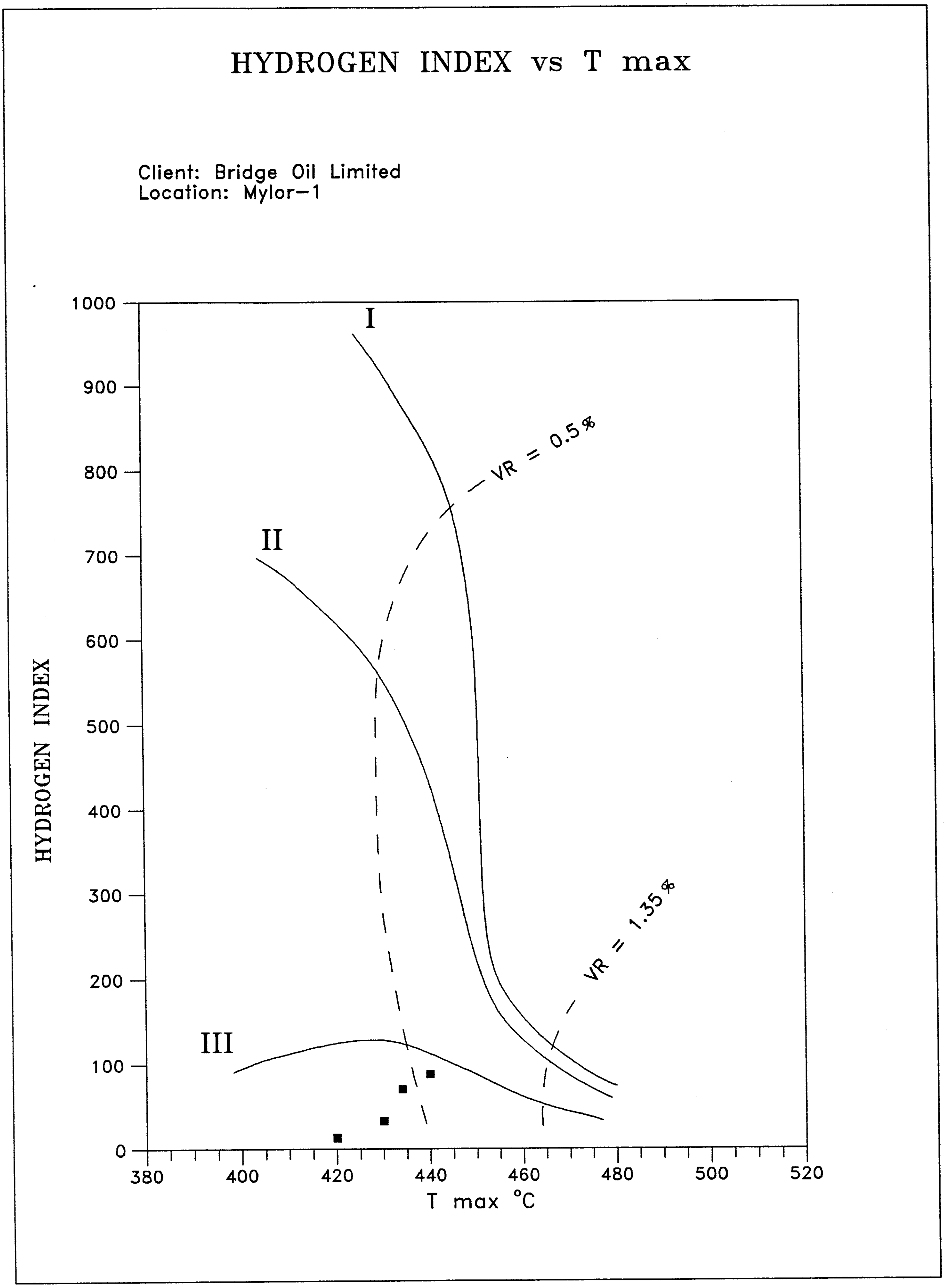

VITRINITE REFLECTANCE VERSUS DEPTH
MYLOR-1
500
700
900
1100
1300
1500
1700
1900
2100
2300
2500
2700
2900
Depth (metres)
0.30
0.35
0.40
0.45
0.50
0.55
0.60
0.65
0.70
0.75
Vitrinite Reflectance (%)

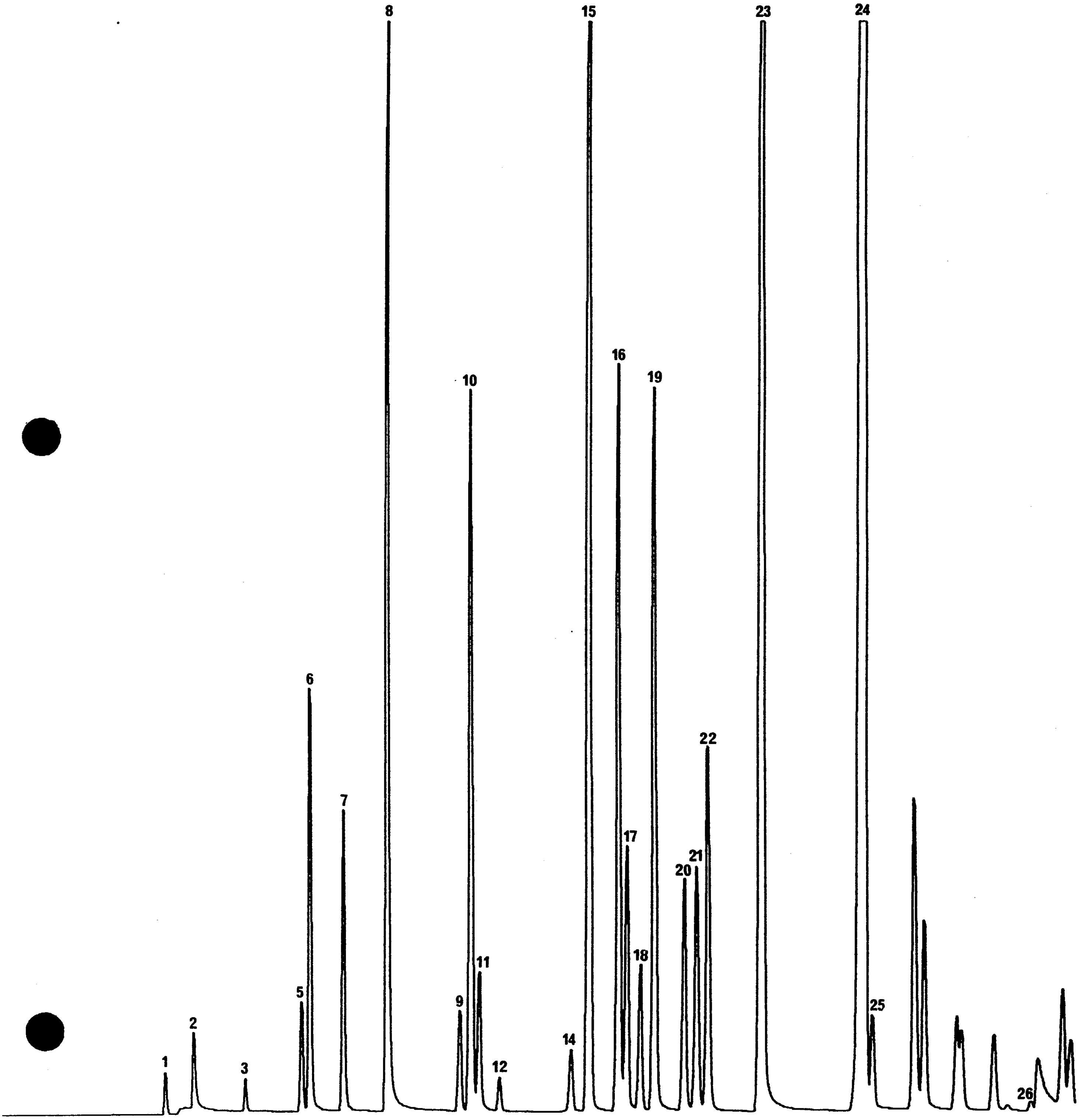
FIGURE 2



HYDROGEN INDEX vs T max
Client: Bridge Oil Limited
Location: Mylor-1
HYDROGEN INDEX
1000
900
800
700
600
500
400
300
200
100
0
380
400
420
440
460
480
500
520
T max °C
I
II
III
VR = 0.5 %
VR = 1.35 %

FIGURE 3

Mylor-1
DST-1 Condensate
Gasoline Range Chromatogram



KEY TO GASOLINE-RANGE CHROMATOGRAM

1. 2-Methylbutane (Isopentane)
2. *n*-Pentane
3. 2,2-Dimethylbutane
4. Cyclopentane
5. 2,3-Dimethylbutane
6. 2-Methylpentane
7. 3-Methylpentane
8. *n*-Hexane
9. 2,2-Dimethylpentane
10. Methylcyclopentane
11. 2,4-Dimethylpentane
12. 2,2,3-Trimethylbutane
13. Benzene
14. 3,3-Dimethylpentane
15. Cyclohexane
16. 2-Methylhexane
17. 2,3-Dimethylpentane
18. 1,1-Dimethylcyclopentane
19. 3-Methylhexane
20. *cis*-1,3-Dimethylcyclopentane
21. *trans*-1,3-Dimethylcyclopentane
22. 3-Ethylpentane and *trans*-1,2-Dimethylcyclopentane
23. *n*-Heptane
24. Methylcyclohexane
25. Ethylcyclopentane
26. Toluene

FIGURE 4

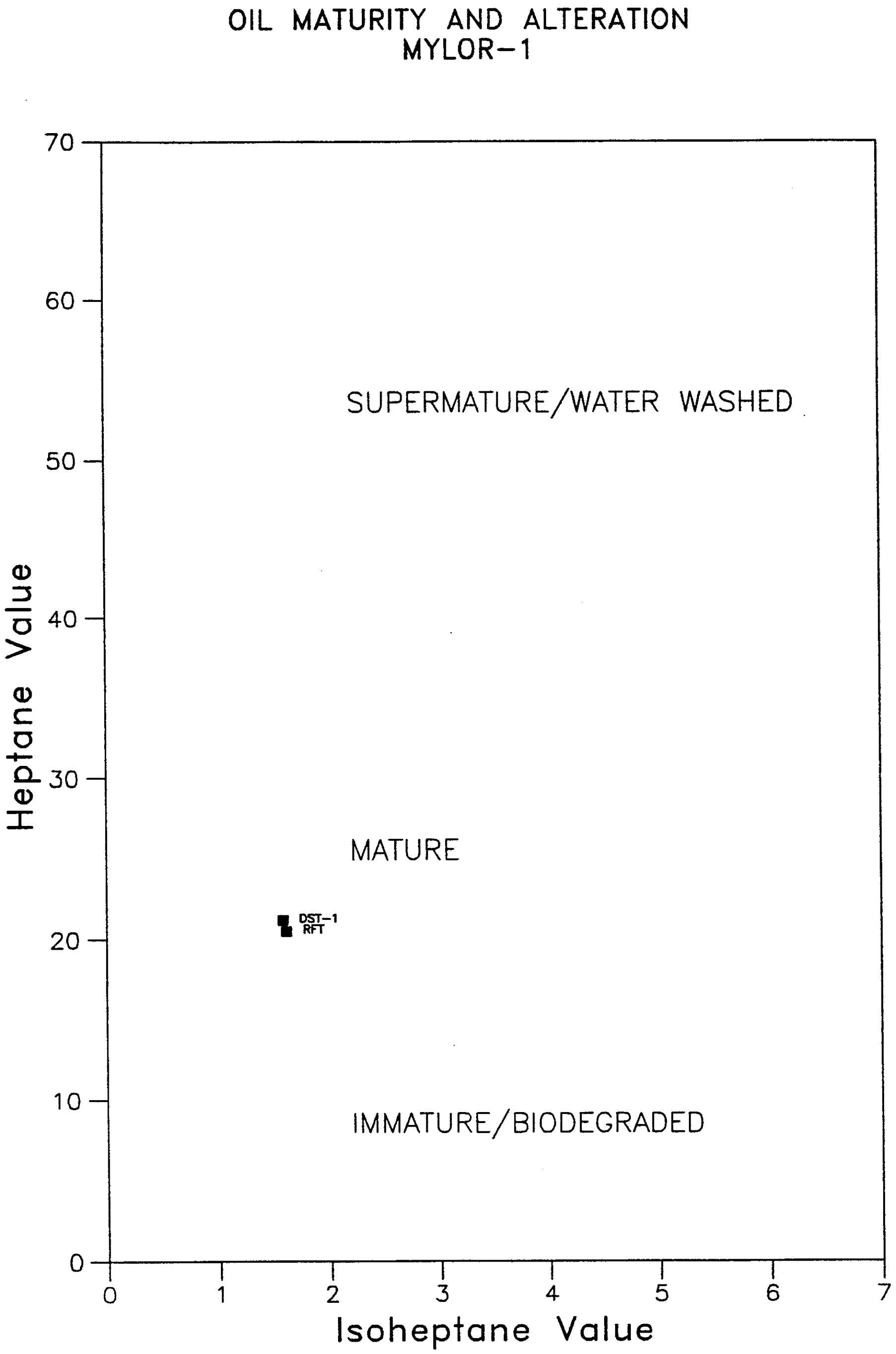

OIL MATURITY AND ALTERATION
MYLOR-1
70
60
50
40
30
20
10
0
Heptane Value
0
1
2
3
4
5
6
7
Isoheptane Value
SUPERMATURE/WATER WASHED
MATURE
IMMATURE/BIODEGRADED
DST-1
RFT

FIGURE 5

OIL SOURCE AFFINITY BASED ON C_5–C_7 ALKANES
MYLOR-1

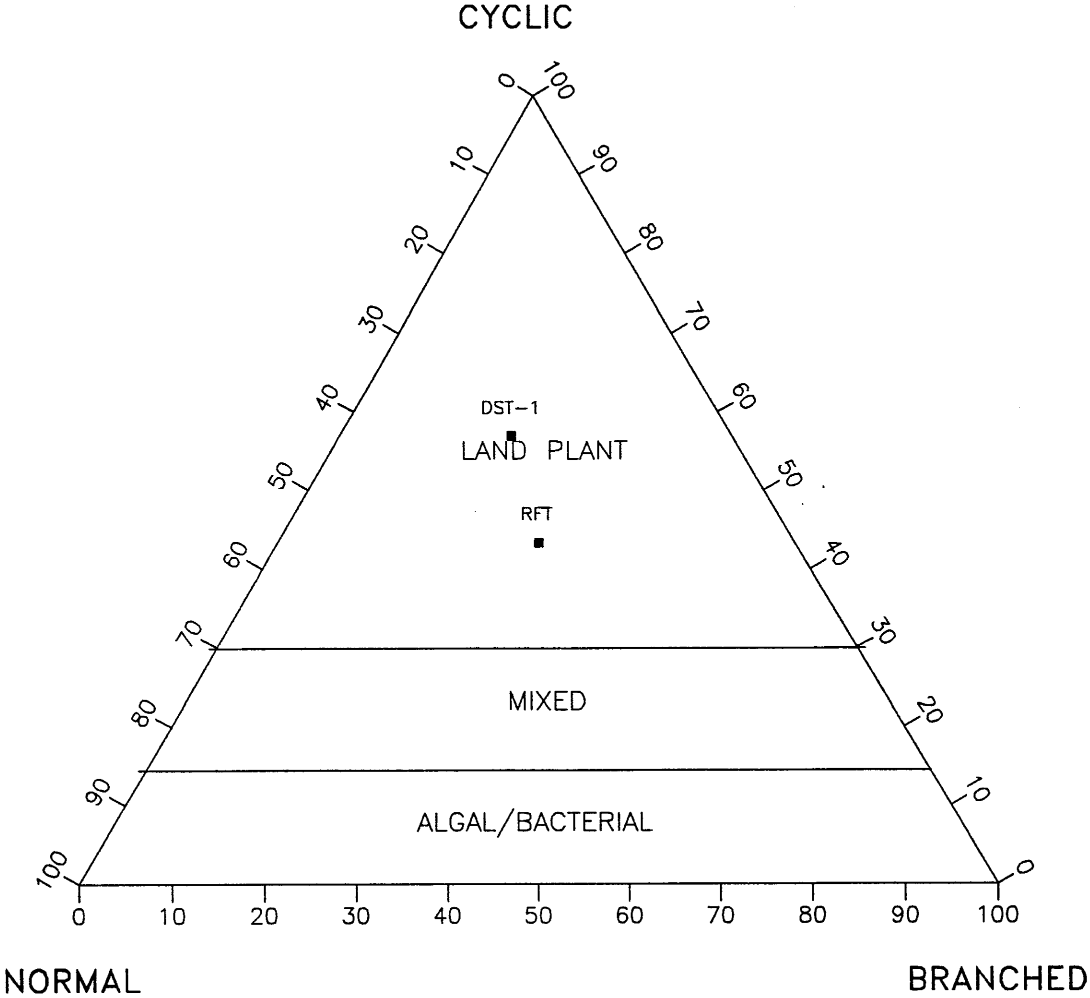
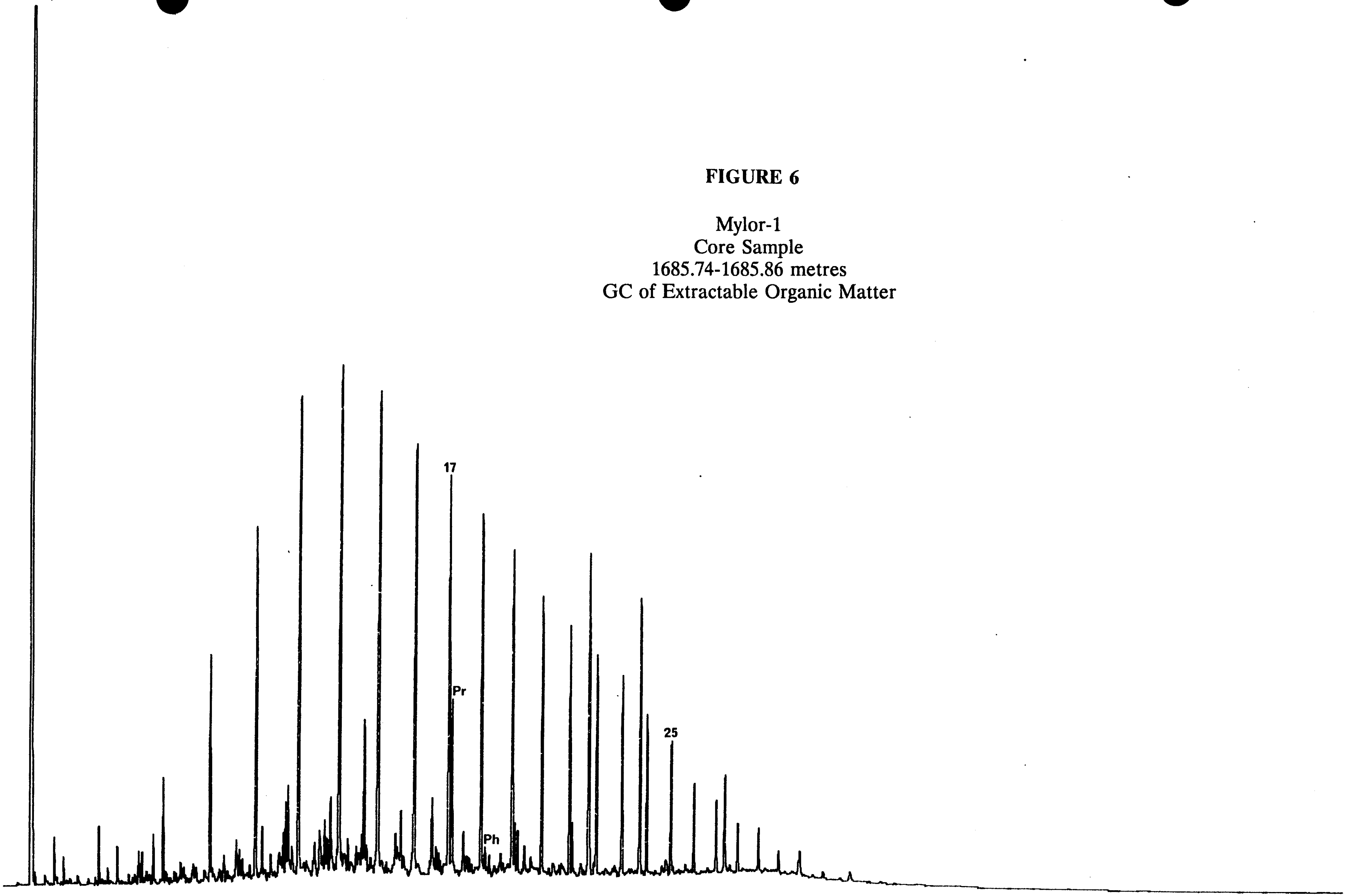


FIGURE 6

Mylor-1
Core Sample
1685.74-1685.86 metres
GC of Extractable Organic Matter



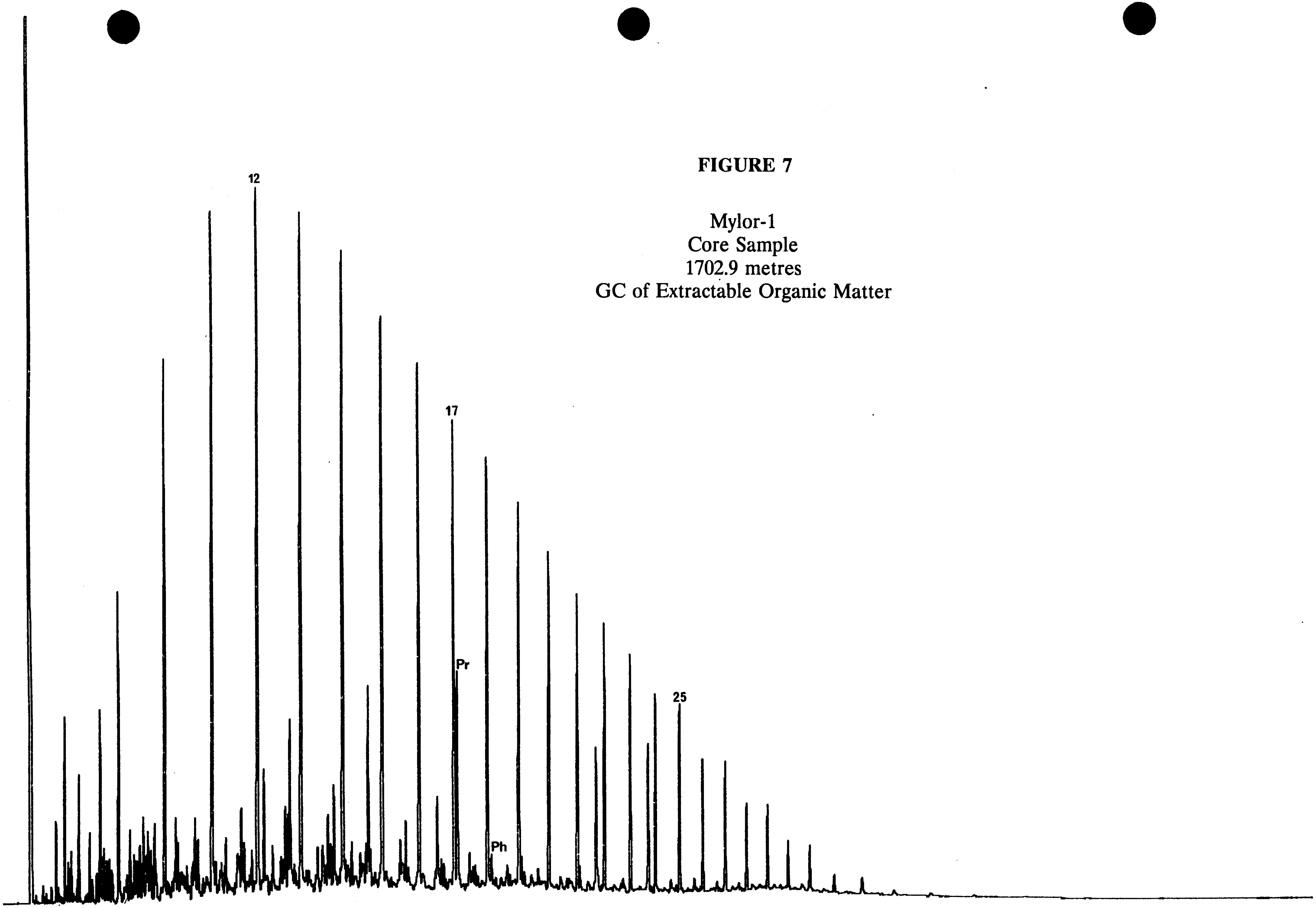


FIGURE 7

Mylor-1
Core Sample
1702.9 metres
GC of Extractable Organic Matter

FIGURE 8

Mylor-1
DST-1, Condensate
GC of saturates fraction

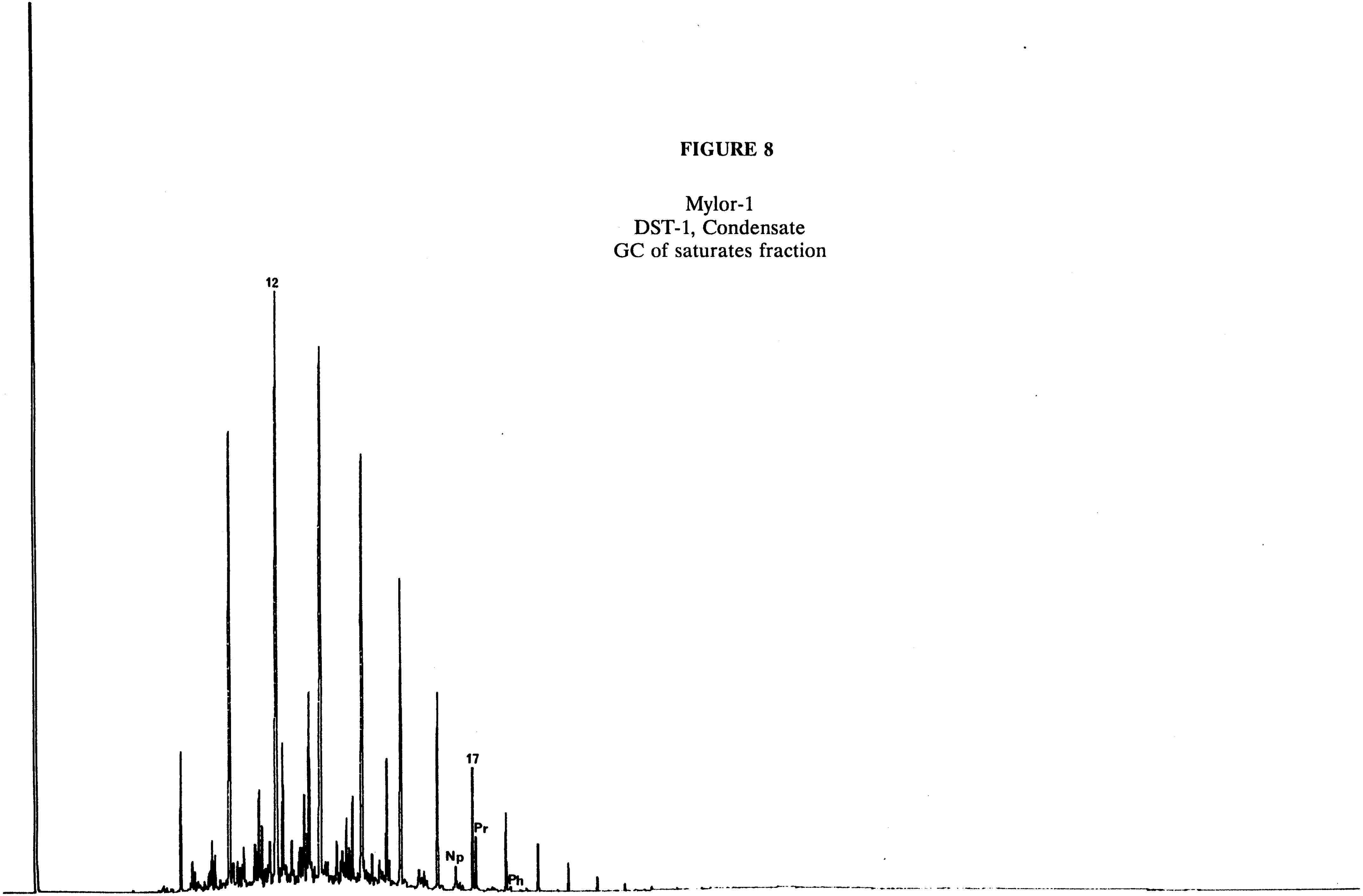
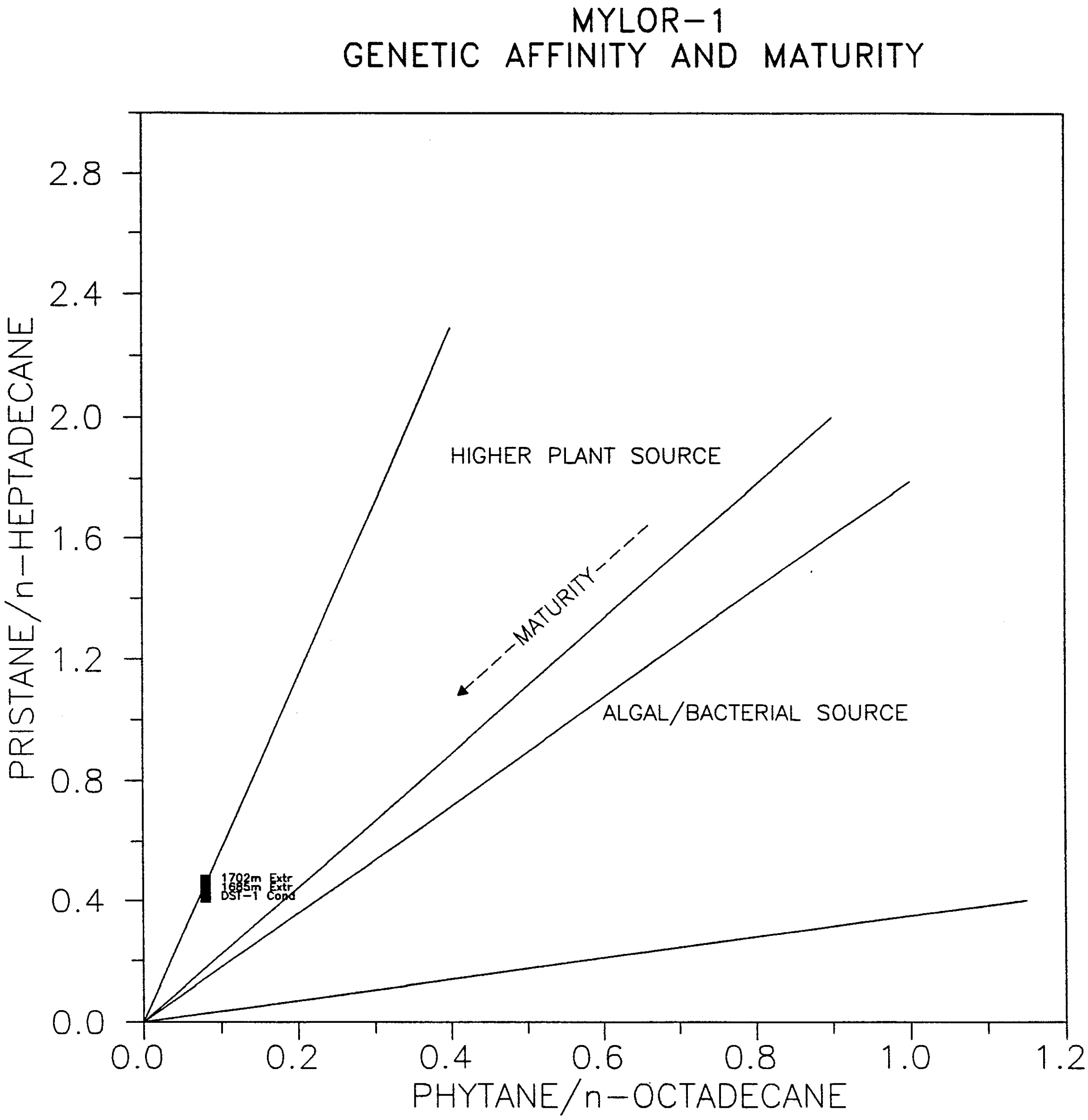


FIGURE 9



MYLOR-1
GENETIC AFFINITY AND MATURITY
PRISTANE/n-HEPTADECANE
PHYTANE/n-OCTADECANE
0.0
0.4
0.8
1.2
1.6
2.0
2.4
2.8
0.0
0.2
0.4
0.6
0.8
1.0
1.2
HIGHER PLANT SOURCE
MATURITY
ALGAL/BACTERIAL SOURCE
1702m Extr
1685m Extr
DST-1 Cond

FIGURE 10

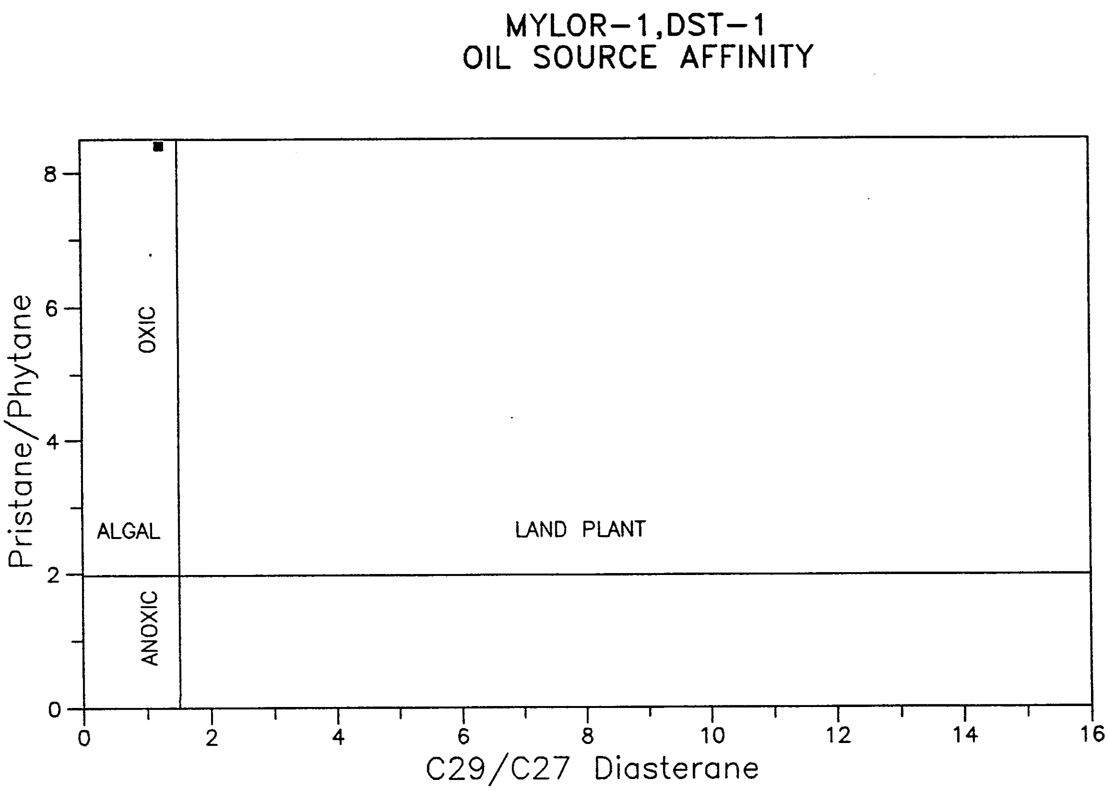
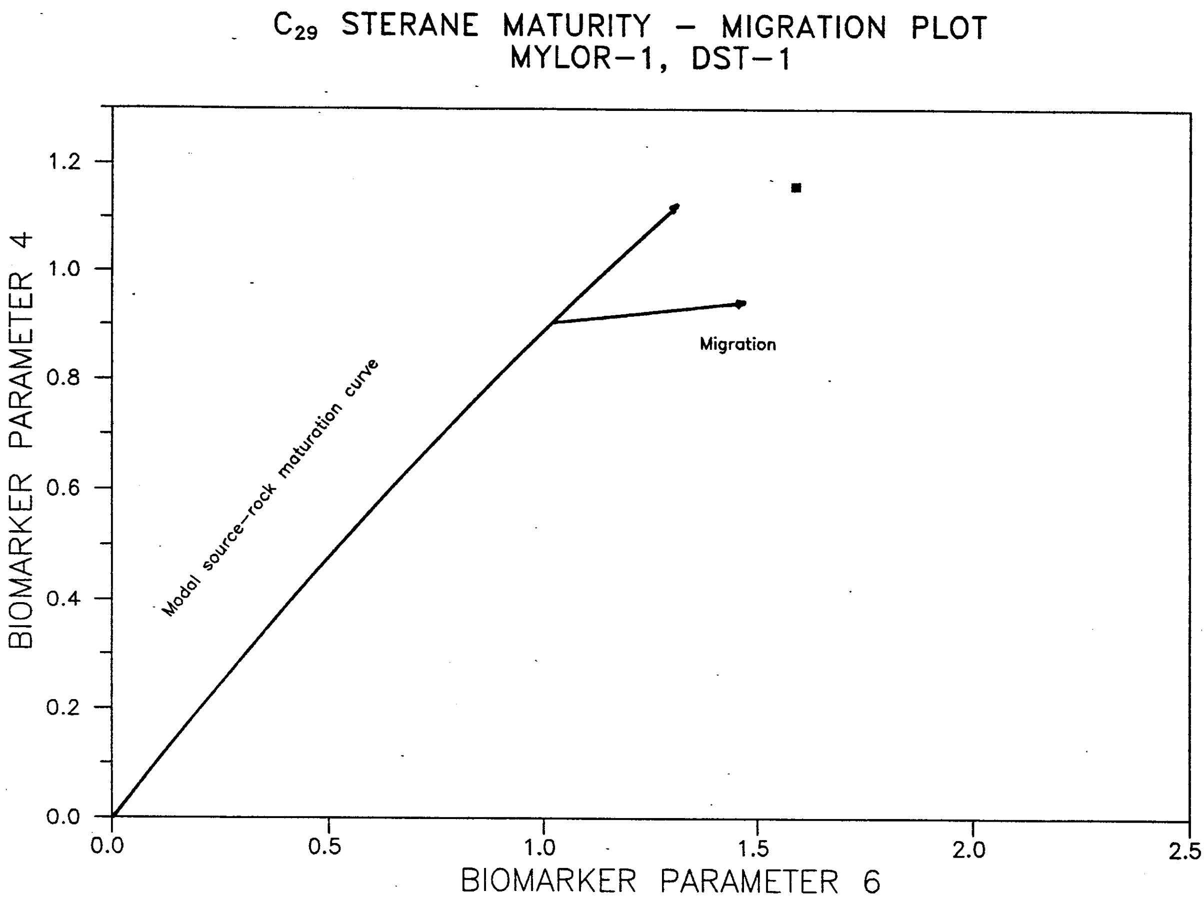

MYLOR-1,DST-1
OIL SOURCE AFFINITY
Pristane/Phytane
C29/C27 Diasterane
OXIC
ALGAL
LAND PLANT
ANOXIC
0
2
4
6
8
10
12
14
16

FIGURE 11



C29 STERANE MATURITY – MIGRATION PLOT
MYLOR–1, DST–1
BIOMARKER PARAMETER 4
1.2
1.0
0.8
0.6
0.4
0.2
0.0
0.0
0.5
1.0
1.5
2.0
2.5
BIOMARKER PARAMETER 6
Modal source-rock maturation curve
Migration

FIGURE 12

STERANE DISTRIBUTIONS
MYLOR-1, DST-1

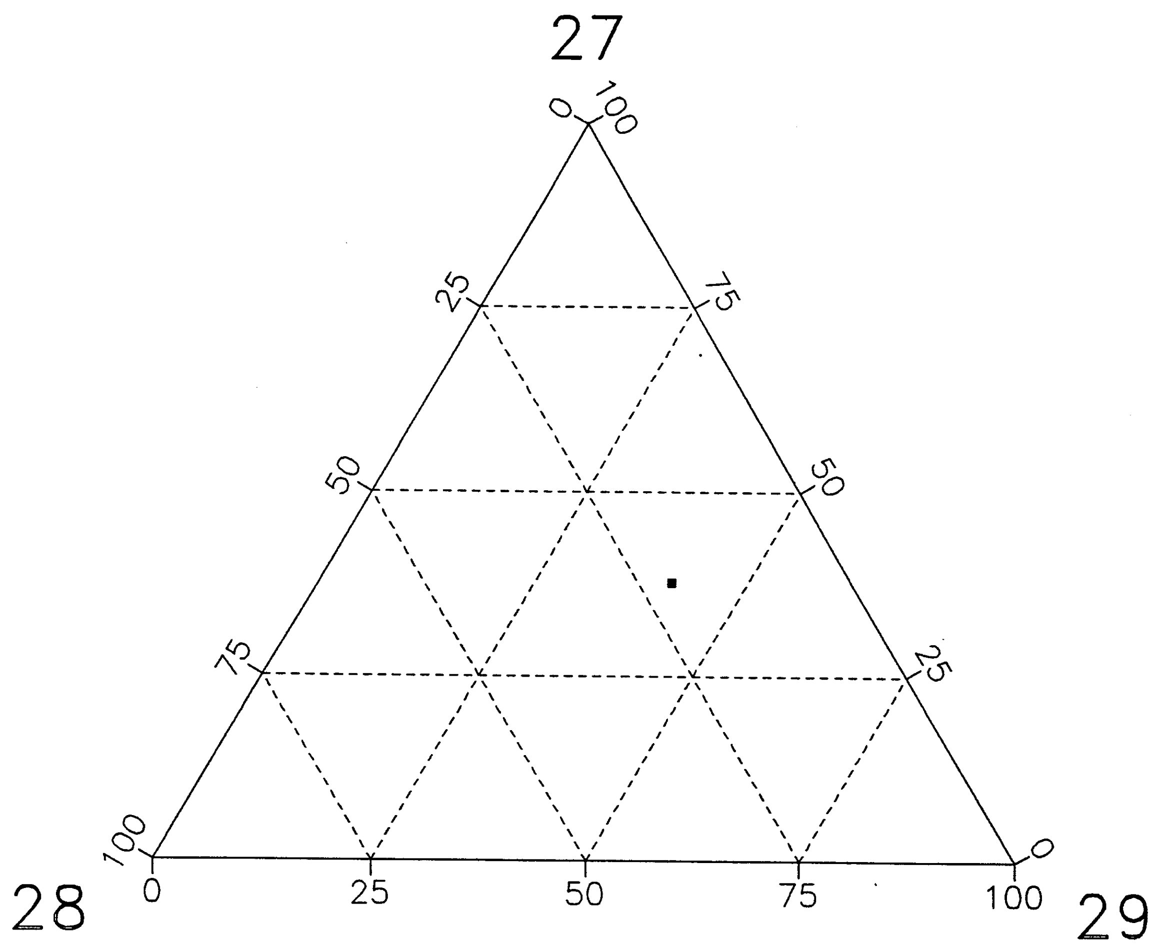
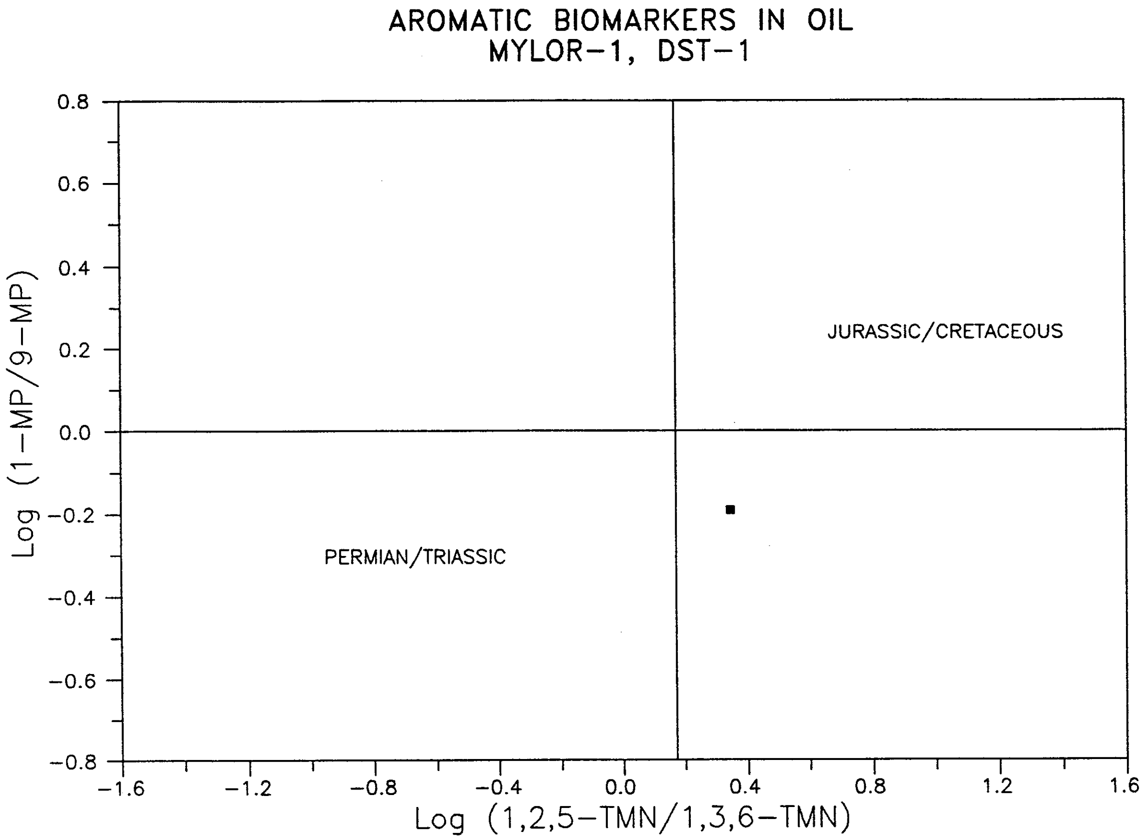


FIGURE 13


AROMATIC BIOMARKERS IN OIL
MYLOR-1, DST-1
JURASSIC/CRETACEOUS
PERMIAN/TRIASSIC
Log (1-MP/9-MP)
Log (1,2,5-TMN/1,3,6-TMN)
0.8
0.6
0.4
0.2
0.0
-0.2
-0.4
-0.6
-0.8
-1.6
-1.2
-0.8
-0.4
0.0
0.4
0.8
1.2
1.6

APPENDIX 1

ANALYTICAL METHODS

1. Sample Preparation

Samples (as received) were ground in a Siebtechnik mill for 20-30 seconds.

2. Total Organic Carbon (TOC)

Total organic carbon was determined by digestion of a known weight (approximately 0.2 g) of powdered rock in HCl to remove carbonates, followed by combustion in oxygen in the induction furnace of a Leco WR-12 Carbon Determinator and measurement of the resultant CO_2 by infra-red detection.

3. Rock-Eval Pyrolysis

A 100 mg portion of powdered rock was analysed by the Rock-Eval pyrolysis technique (Girdel IFP-Fina Mark 2 instrument; operating mode, Cycle 1).

4. Organic Petrology

Representative portions of each sample (crushed to -14+35 BSS mesh) were obtained with a sample splitter and then mounted in cold setting Glasscraft resin using a 2.5 cm diameter mould. Each block was ground flat using diamond impregnated laps and carborundum paper. The surface was then polished with aluminium oxide and finally magnesium oxide.

Reflectance measurements were made with a Leitz MPV1.1 microphotometer fitted to a Leitz Ortholux microscope and calibrated against synthetic standards. All measurements were taken using oil immersion (n = 1.518) and incident monochromatic light (wavelength 546 nm) at a temperature of 23 ± 1°C. Fluorescence observations were made on the same microscope utilising a 3 mm BG3 excitation filter, a TK400 dichroic mirror and a K510 suppression filter.

5. Isolation of Residual Oil

Core chips and cuttings samples were extracted with dichloromethane in Soxhlet apparatus for 8 hours. Removal of solvent by careful rotary evaporation gave the oil (nominal C_{12+} fraction).

6. Liquid Chromatography

Asphaltenes were not precipitated from the condensate prior to liquid chromatography. The samples were separated into hydrocarbons (saturates and aromatics) and polar compounds (resins) by liquid chromatography on activated alumina (sample: adsorbent ratio = 1.100). Hydrocarbons were eluted with petroleum ether/dichloromethane (75:25) and resins with methanol/dichloromethane (65:35).

The saturated and aromatic hydrocarbons were then separated by liquid chromatography on activated silica gel (sample/adsorbent ratio = 1:100). The saturated hydrocarbons were eluted with petroleum ether and the aromatic hydrocarbons with petroleum ether/dichloromethane (91:9).

7. Gas Chromatography

Whole oils and saturated hydrocarbons (alkanes) were examined by gas chromatography using the following instrumental parameters:

Gas Chromatograph:	Perkin Elmer 8500 operated in the split injection mode
Column:	25 m x 0.3 mm fused silica, SGE QC3/BP1
Detector Temperature:	300°C
Column Temperature:	40°C for 1 minute, then 8° per minute to 300°C and held isothermal at 300°C until all peaks eluted
Quantification:	Relative concentrations of individual hydrocarbons were obtained by measurement of peak areas with a Perkin-Elmer LCI 100 integrator. The areas of peaks responding to aromatic hydrocarbons were multiplied by appropriate response factors

8. Thin Layer Chromatography (TLC)

Aromatic hydrocarbons were isolated from the extracted oil by preparative TLC using Merck GF_{254} silica plates and distilled AR grade n-pentane as eluent. Naphthalene and anthracene were employed as reference standards for the diaromatic and triaromatic hydrocarbons, respectively. These two bands, visualised under UV light, were scraped from the plate and the aromatic hydrocarbons redissolved in dichloromethane.

GC-MS analysis of the aromatic hydrocarbons was undertaken in the selected ion detection (SID) mode. The instrument and its operating parameters were as follows:

System:	Perkin-Elmer 8420 GC coupled with a Finigan Ion Trap mass selective detector and data system
Column:	25 mm x 0.2 mm i.d. HP BP5 cross-linked methylsilicone phase fused silica, interfaced to source of mass spectrometer
Injector:	Split injection (8:1)
Carrier Gas:	He at 60 Kpa head pressure
Column Temperature:	50-260°C @ 4°/minute
Mass Spectrometer Conditions:	Selected ion monitoring

The following mass fragmentograms were recorded:

m/z	**Compound Type**
155 + 156	dimethylnaphthalenes
169 + 170	trimethylnaphthalenes
178	phenanthrene
191 + 192	methylphenanthrene

The area of the phenanthrene peak was multiplied by a response factor of 0.667 when calculating the methylphenanthrene index (MPI).

Naphthenes (branched/cyclic alkanes) were isolated from the oil by molecular sieve separation of the saturates fraction.

GC-MS analysis of the naphthenes was undertaken in the multiple ion detection (MID) mode. Instrumental conditions are given below.

System:	HP 5890 Series II Plus GC coupled to HP 5972 MSD
Column:	25 mm x 0.25 mm i.d. HPS MS cross-linked methylsilicone phase fused silica, interfaced directly to source of mass spectrometer
Injector:	Splitless 2μL
Carrier Gas:	Helium at a linear velocity of 26 cm/minute
Column Temperature:	50°C for 2 minutes then 50-290°C @ 7°/minute
Mass Spectrometer Conditions:	70 eV EI; 9-ion selected ion monitoring, 70 millisec dwell time for each ion

The following mass fragmentograms were recorded:

m/z	**Compound Type**
83	alkylcyclohexanes
123	drimanes, diterpanes
177	demethylated triterpanes
183	acyclic alkanes (incl isoprenoids, botryococcanes)
191	triterpanes (incl hopanes, moretanes)
205	methyltriterpanes
217	steranes
218	steranes
231	4-methylsteranes
259	diasteranes

10. Gasoline-Range Hydrocarbons

The condensate samples were analysed on a Perkin-Elmer 8500 Gas Chromatograph equipped with a 50 m, 0.2 mm i.d. HP PONA column. Concentrations of C_3 - C_8 hydrocarbons were calculated from the peak areas for each compound.

APPENDIX 2

VITRINITE REFLECTANCE VALUES AND HISTOGRAMS

Vitrinite Reflectance Values

Well:	*Mylor–1*
Depth:	*650–660 m.*

<u>Sorted List</u>

0.39
0.40

Number of values	2
Mean of values	0.40
Standard Deviation	0.01

HISTOGRAM OF VALUES
Reflectance values multiplied by 100

39–41 **

Vitrinite Reflectance Values

Well: *Mylor−1*
Depth: *840−850 m.*

Sorted List

0.40
0.41
0.44

Number of values	3
Mean of values	0.42
Standard Deviation	0.02

HISTOGRAM OF VALUES
Reflectance values multiplied by 100

40−42 **
43−45 *

Vitrinite Reflectance Values

Well: *Mylor−1*
Depth: *1386−1389 m.*

Sorted List

0.43	0.49
0.45	0.49
0.45	0.50
0.46	0.50
0.46	0.50
0.47	0.50
0.47	0.51
0.48	0.51
0.48	0.51
0.48	0.52

Number of values	20
Mean of values	0.48
Standard Deviation	0.02

HISTOGRAM OF VALUES
Reflectance values multiplied by 100

43−45	***
46−48	*******
49−51	*********
52−54	*

Vitrinite Reflectance Values

Well: *Mylor−1*
Depth: *1550 m.*

Sorted List

0.51
0.51
0.52
0.52
0.54
0.57

Number of values	6
Mean of values	0.53
Standard Deviation	0.02

HISTOGRAM OF VALUES
Reflectance values multiplied by 100

51−53	****
54−56	*
57−59	*

Vitrinite Reflectance Values

Well: *Mylor–1*
Depth: *1744 m.*

Sorted List

0.40	0.48
0.41	0.50
0.42	0.50
0.43	0.50
0.44	0.51
0.46	0.52
0.46	
0.47	
0.47	
0.48	

Number of values	16
Mean of values	0.47
Standard Deviation	0.04

HISTOGRAM OF VALUES
Reflectance values multiplied by 100

40–42	***
43–45	**
46–48	******
49–51	****
52–54	*

Vitrinite Reflectance Values

Well: *Mylor-1*
Depth: *1835 m.*

Sorted List

0.43	0.50
0.43	0.51
0.47	0.51
0.47	0.52
0.47	0.53
0.48	0.55
0.49	0.55
0.50	0.57
0.50	
0.50	

Number of values	18
Mean of values	0.50
Standard Deviation	0.04

HISTOGRAM OF VALUES
Reflectance values multiplied by 100

43-45	**
46-48	****
49-51	*******
52-54	**
55-57	***

Vitrinite Reflectance Values

Well: *Mylor−1*
Depth: *1901 m.*

Sorted List

0.52
0.52
0.52
0.54
0.54
0.55

Number of values	6
Mean of values	0.53
Standard Deviation	0.01

HISTOGRAM OF VALUES
Reflectance values multiplied by 100

52−54 ***
55−57 ***

APPENDIX 3

PHOTOMICROGRAPHS

PE906752

This is an enclosure indicator page.
The enclosure PE906752 is enclosed within the container PE900935 at this location in this document.

The enclosure PE906752 has the following characteristics:

ITEM_BARCODE = PE906752
CONTAINER_BARCODE = PE900935
NAME = Photomicrograph, Appendix 5, Figure 1-2
BASIN = OTWAY
PERMIT = PEP108
TYPE = WELL
SUBTYPE = PHOTOMICROGRAPH
DESCRIPTION = Photomicrograph, Appendix 5, Figure 1-2, Mylor-1
REMARKS =
DATE_CREATED = 18/10/94
DATE_RECEIVED = 23/03/95
W_NO = W1102
WELL_NAME = MYLOR-1
CONTRACTOR = AMDEL
CLIENT_OP_CO = BRIDGE OIL LIMITED

(Inserted by DNRE - Vic Govt Mines Dept)

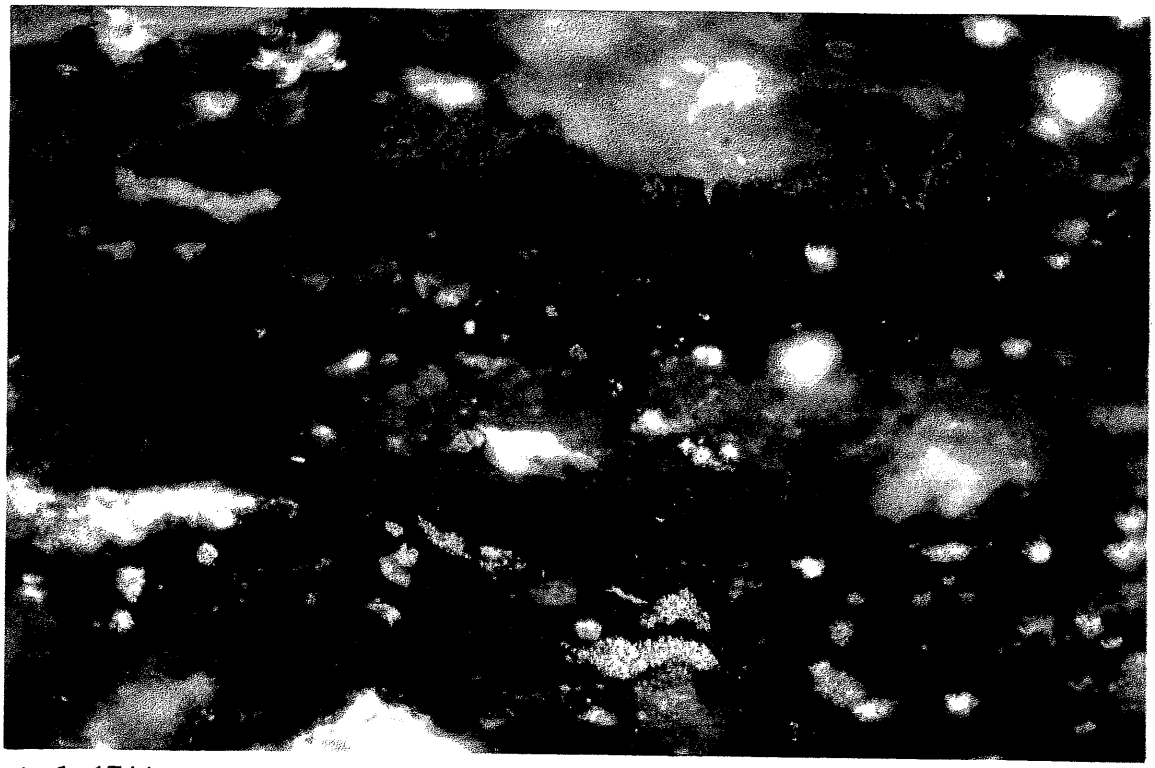


Plate 1: 1744 metres depth

Reflected Light

Vitrinite (grey) occurs in stringers in this sample. Inertinite (light grey) is present as inertodetrinite.

Field dimensions: 0.26 x 0.53 mm.

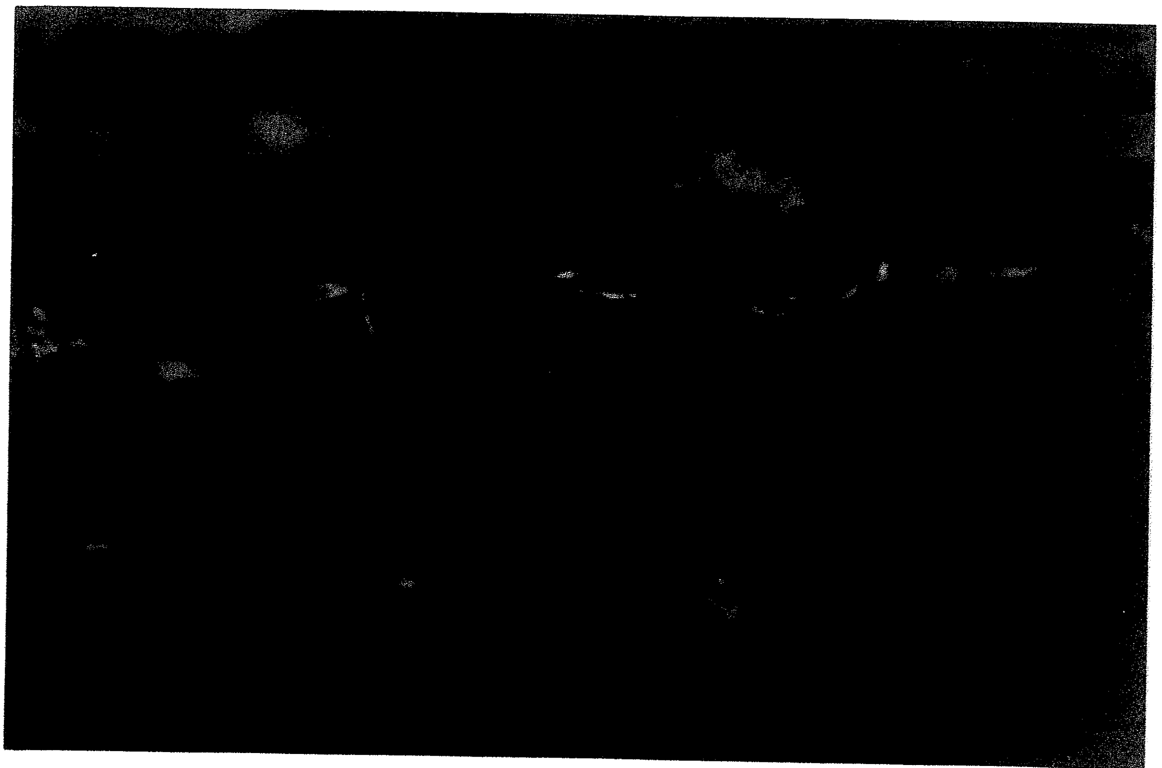


Plate 2: 1744 metres depth

Fluorescence Mode

Resinite (intense orange) cutinite and liptodetrinite (moderate orange) are more easily distinguished in fluorescence mode and are associated with the vitrinite in this field of view.

DEPT. NAT. RES & ENV
PE906752

PE906753

This is an enclosure indicator page.
The enclosure PE906753 is enclosed within the container PE900935 at this location in this document.

The enclosure PE906753 has the following characteristics:

ITEM_BARCODE = PE906753
CONTAINER_BARCODE = PE900935
NAME = Photomicrograph, Appendix 5, Figure 3-4
BASIN = OTWAY
PERMIT = PEP108
TYPE = WELL
SUBTYPE = PHOTOMICROGRAPH
DESCRIPTION = Photomicrograph, Appendix 5, Figure 3-4, Mylor-1
REMARKS =
DATE_CREATED = 18/10/94
DATE_RECEIVED = 23/03/95
W_NO = W1102
WELL_NAME = MYLOR-1
CONTRACTOR = AMDEL
CLIENT_OP_CO = BRIDGE OIL LIMITED

(Inserted by DNRE - Vic Govt Mines Dept)

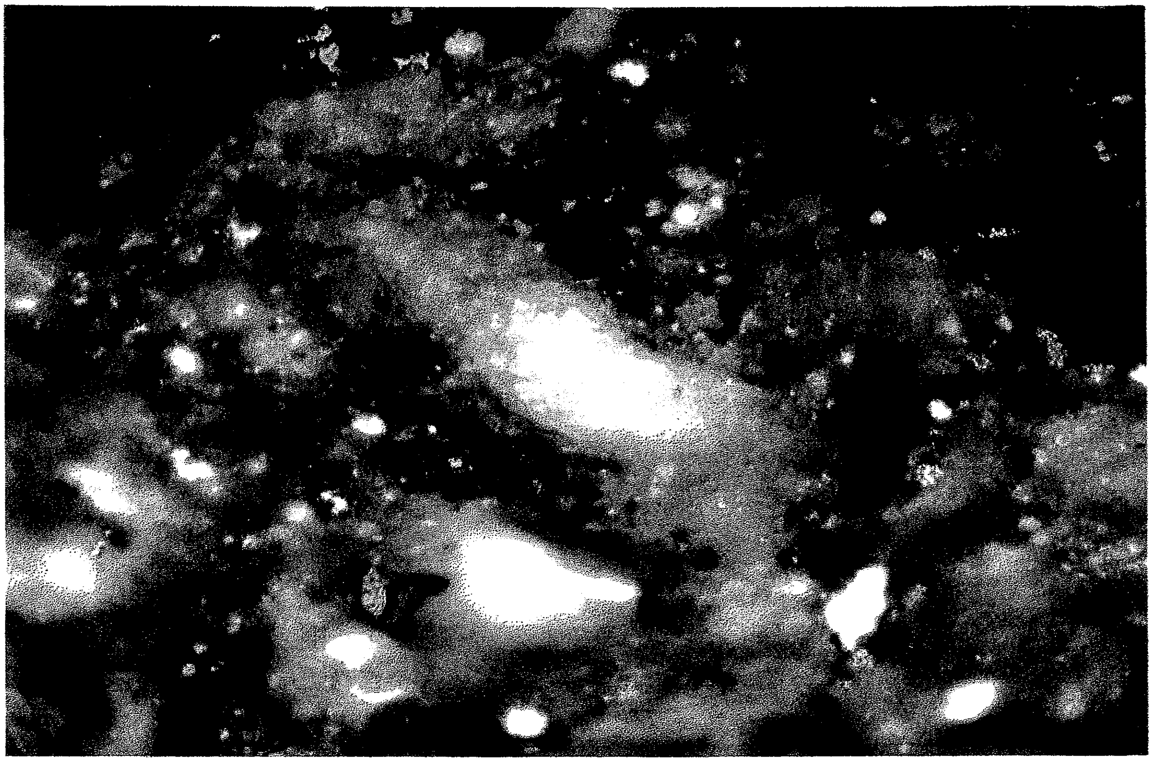


Plate 3: 1744 metres depth Reflected Light

Organic matter in this SWC consists largely of inertinite (grey). Small detrital vitrinite is also present in this sample.

Field dimensions: 0.26 x 0.53 mm.

Plate 4: 1744 metres depth Fluorescence Mode

Phytoplankton and litodetrinite are identified in fluorescence mode.

DEPT. NAT. RES & ENV
PE906753

PE906754

This is an enclosure indicator page.
The enclosure PE906754 is enclosed within the container PE900935 at this location in this document.

The enclosure PE906754 has the following characteristics:

ITEM_BARCODE = PE906754
CONTAINER_BARCODE = PE900935
NAME = Photomicrograph, Appendix 5, Figure 5-6
BASIN = OTWAY
PERMIT = PEP108
TYPE = WELL
SUBTYPE = PHOTOMICROGRAPH
DESCRIPTION = Photomicrograph, Appendix 5, Figure 5-6, Mylor-1
REMARKS =
DATE_CREATED = 18/10/94
DATE_RECEIVED = 23/03/95
W_NO = W1102
WELL_NAME = MYLOR-1
CONTRACTOR = AMDEL
CLIENT_OP_CO = BRIDGE OIL LIMITED

(Inserted by DNRE - Vic Govt Mines Dept)

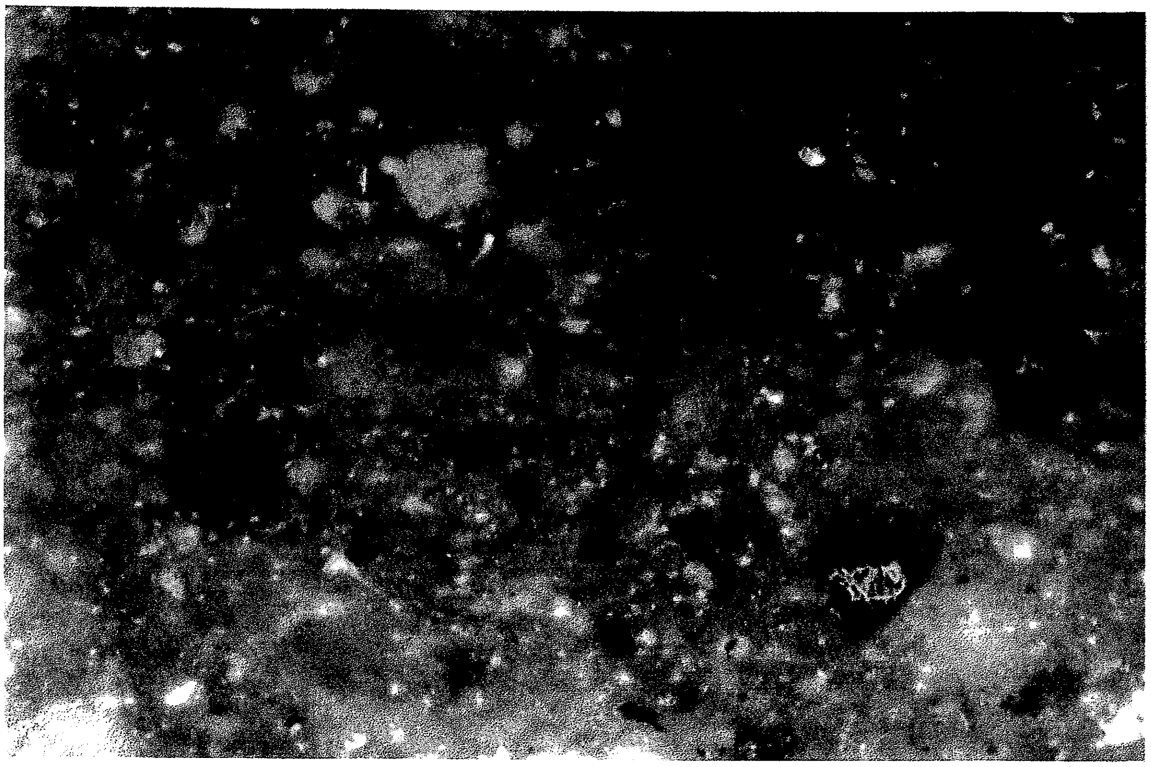


Plate 5: 1835 metres depth Reflected Light

Organic matter in this field of view consists largely of detrital inertinite (inertodetrinite).

Field dimensions: 0.26 x 0.53 mm.

Plate 6: 1835 metres depth Fluorescence Mode

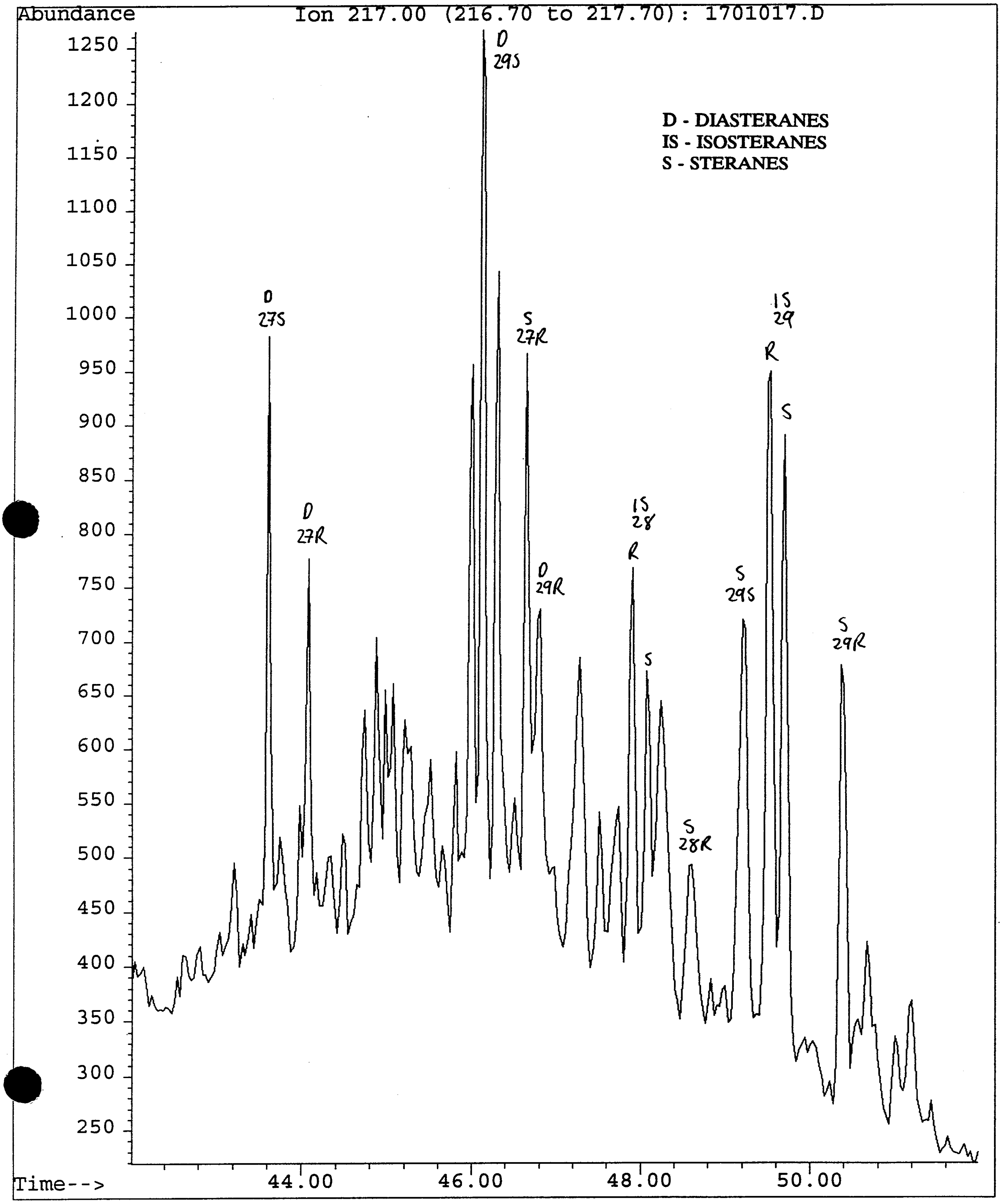
The low abundance of liptinite is evident in this plate with only trace liptodetrinite being present.

DEPT. NAT. RES & ENV
PE906754

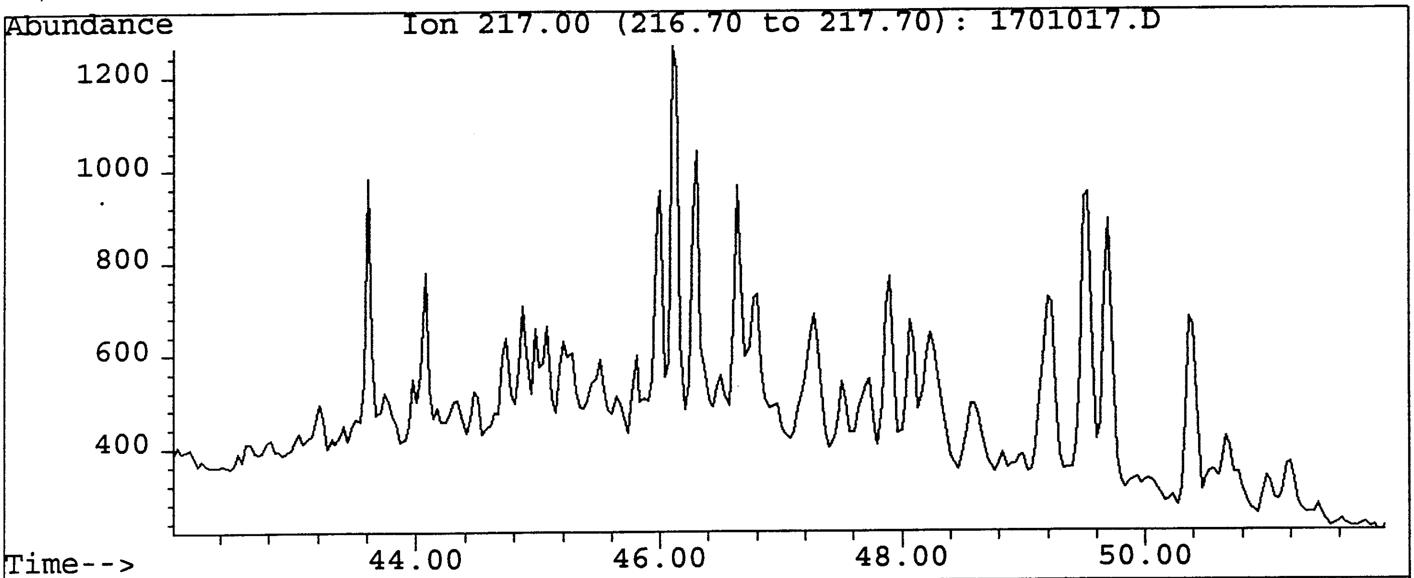
APPENDIX 4

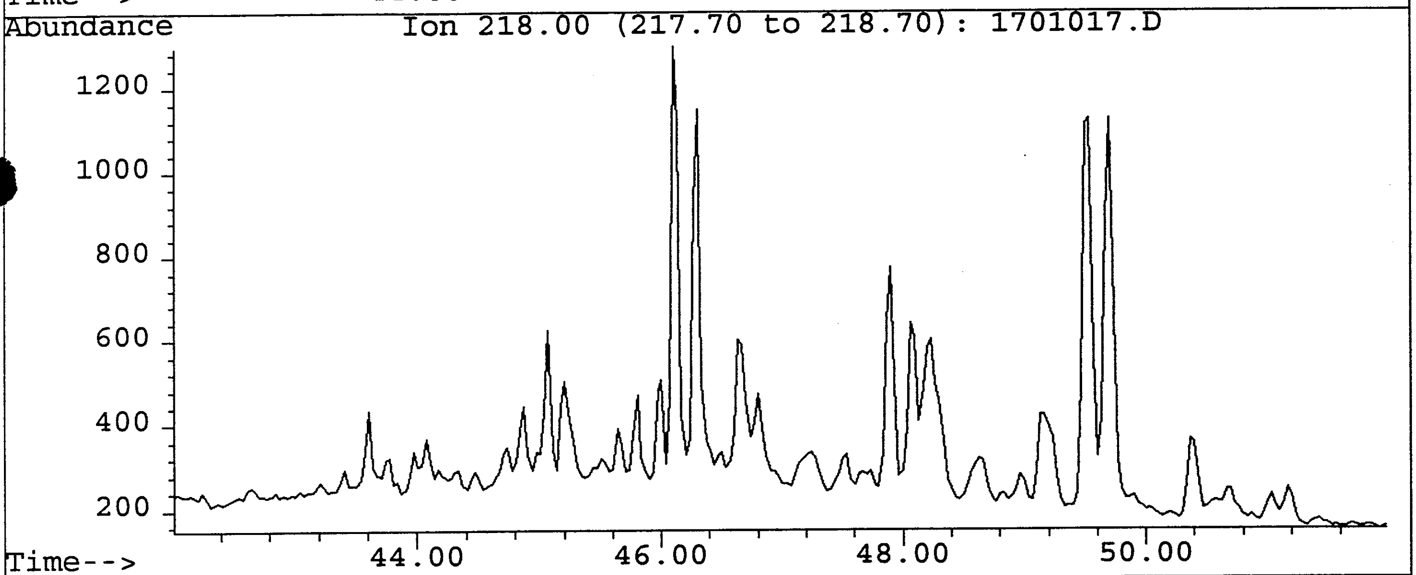
GC-MS OF BRANCHED/CYCLIC ALKANES

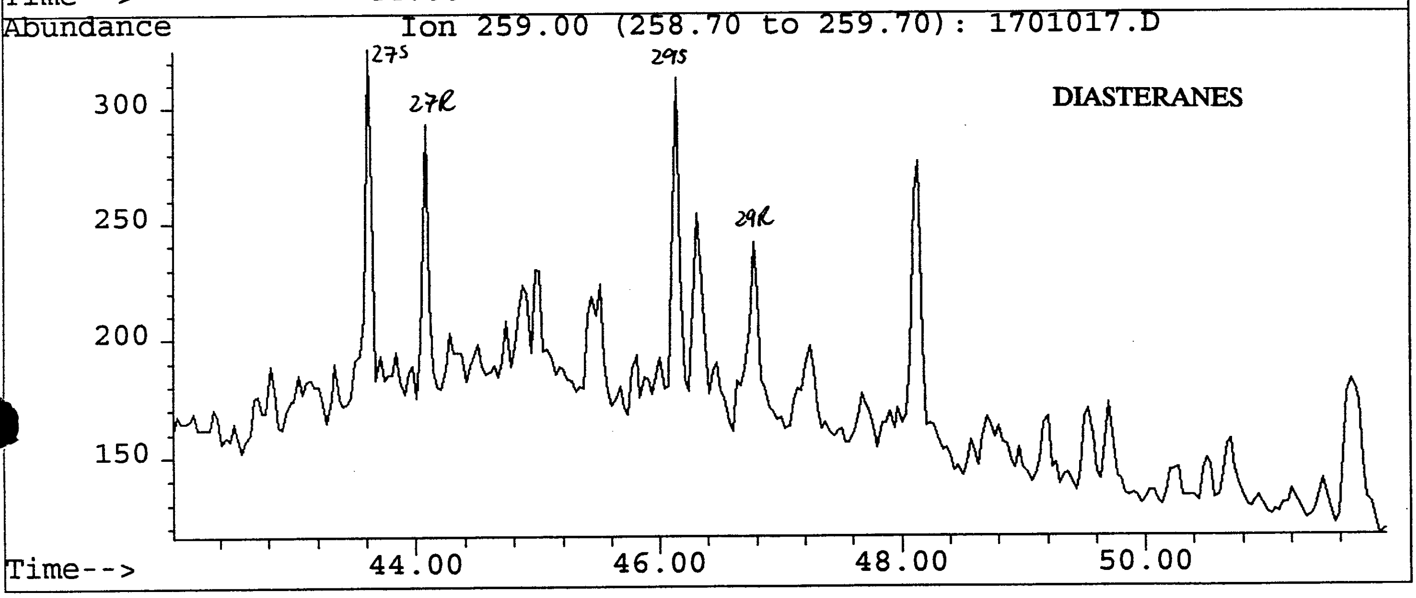
File: C:\HPCHEM\1\DATA\PETSERV\050894\1701017.D
Operator: Scott Wythe
Date Acquired: 6 Aug 94 10:42 am
Instrument: AMDEL-597
Method File: NAPHTH
Sample Name: MYLOR-1, DST-1 CONDENSATE
Misc Info:
Vial Number : 17



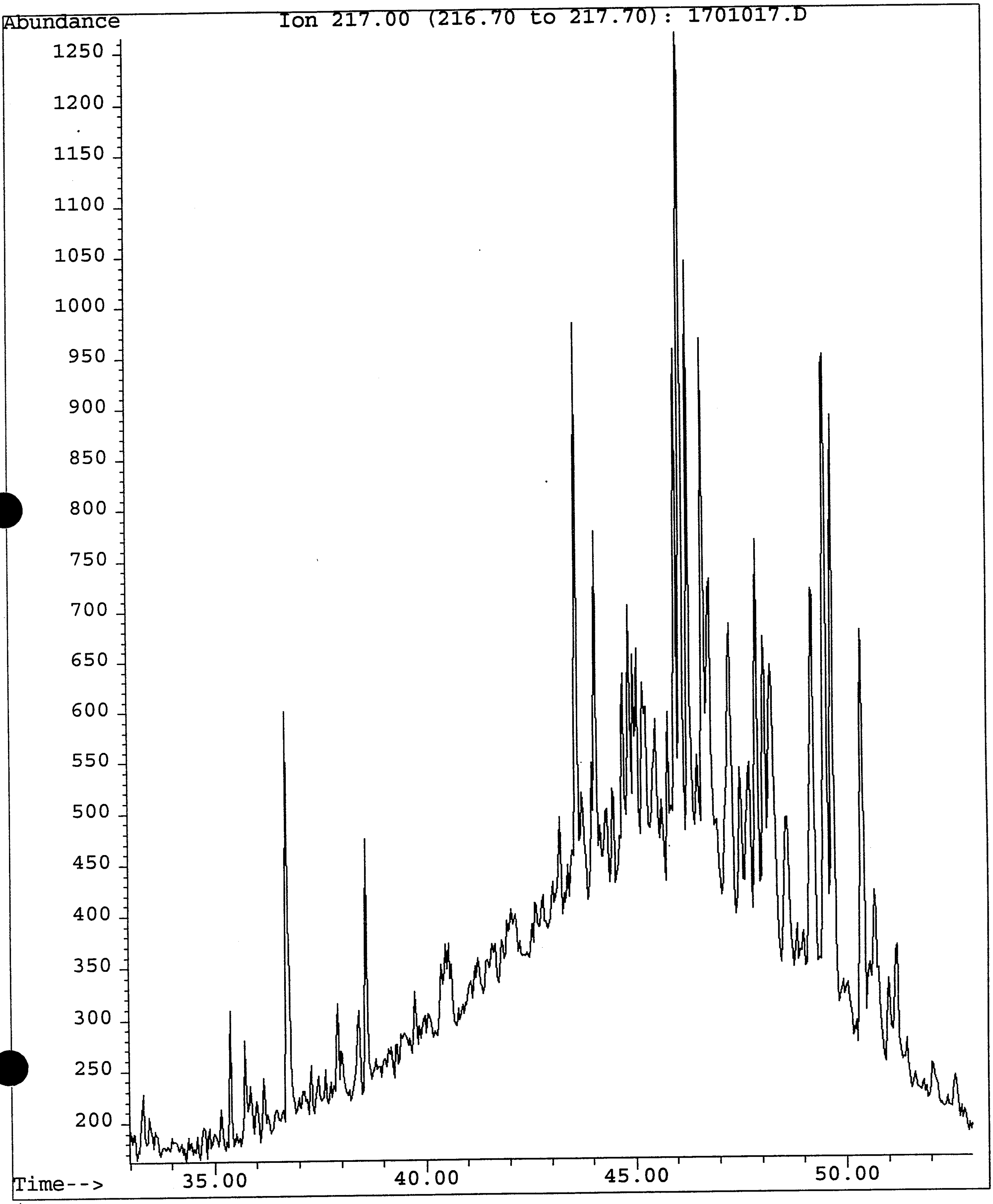
File: C:\HPCHEM\1\DATA\PETSERV\050894\1701017.D
Operator: Scott Wythe
Date Acquired: 6 Aug 94 10:42 am
Instrument: AMDEL-597
Method File: NAPHTH
Sample Name: MYLOR-1, DST-1 CONDENSATE
Misc Info:
Vial Number : 17



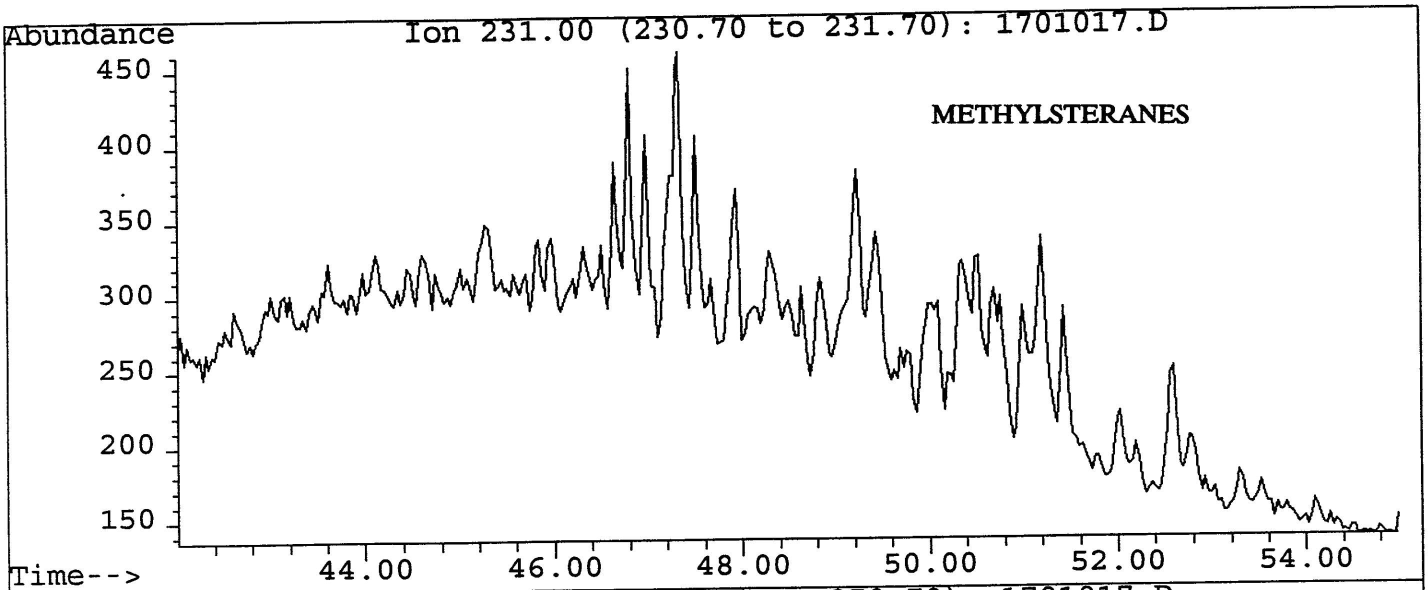


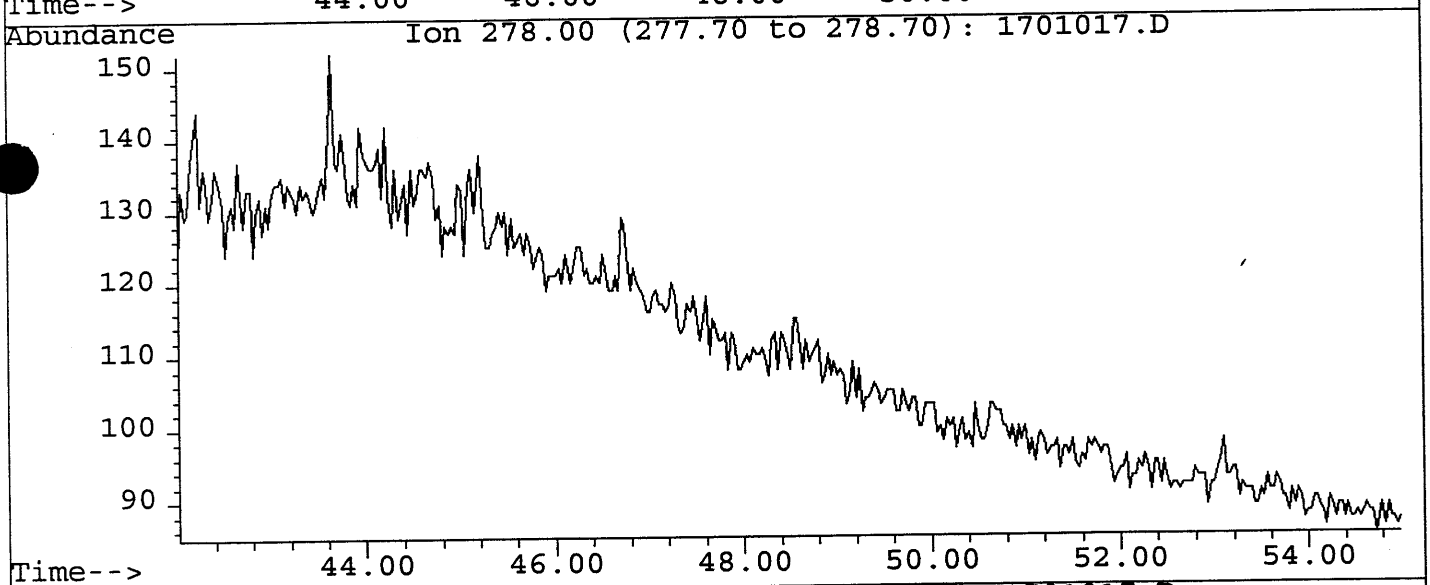


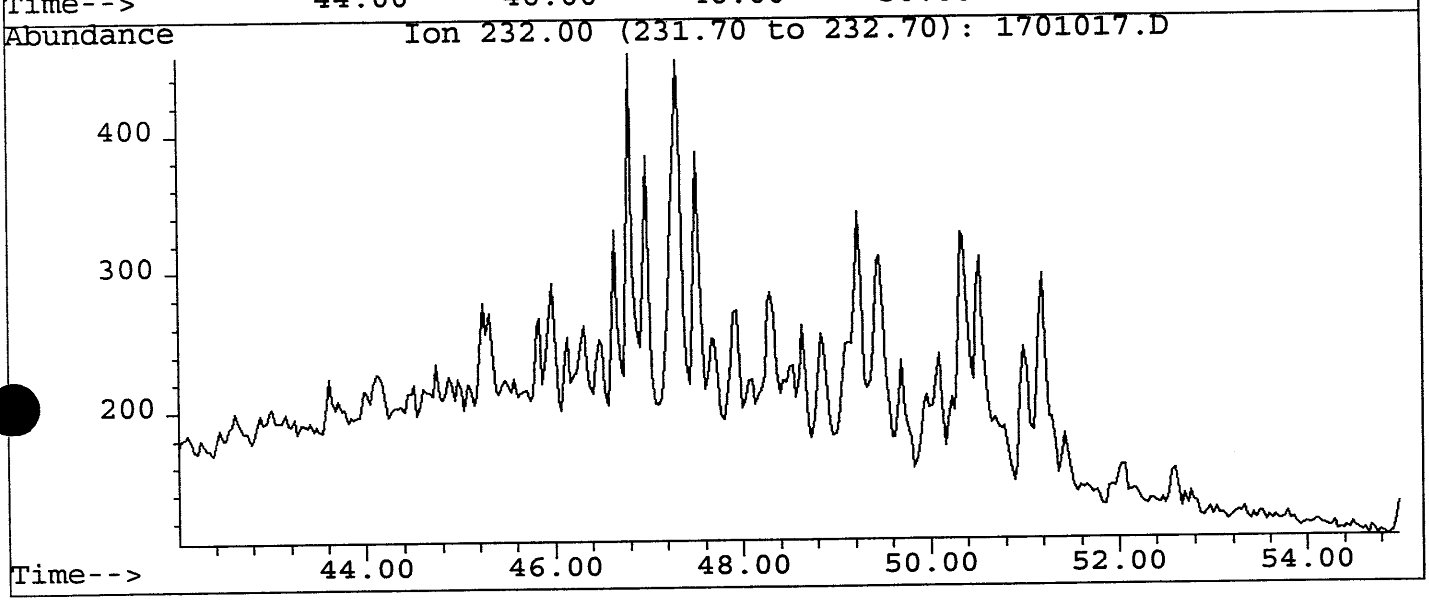
File: C:\HPCHEM\1\DATA\PETSERV\050894\1701017.D
Operator: Scott Wythe
Date Acquired: 6 Aug 94 10:42 am
Instrument: AMDEL-597
Method File: NAPHTH
Sample Name: MYLOR-1, DST-1 CONDENSATE
Misc Info:
Vial Number : 17



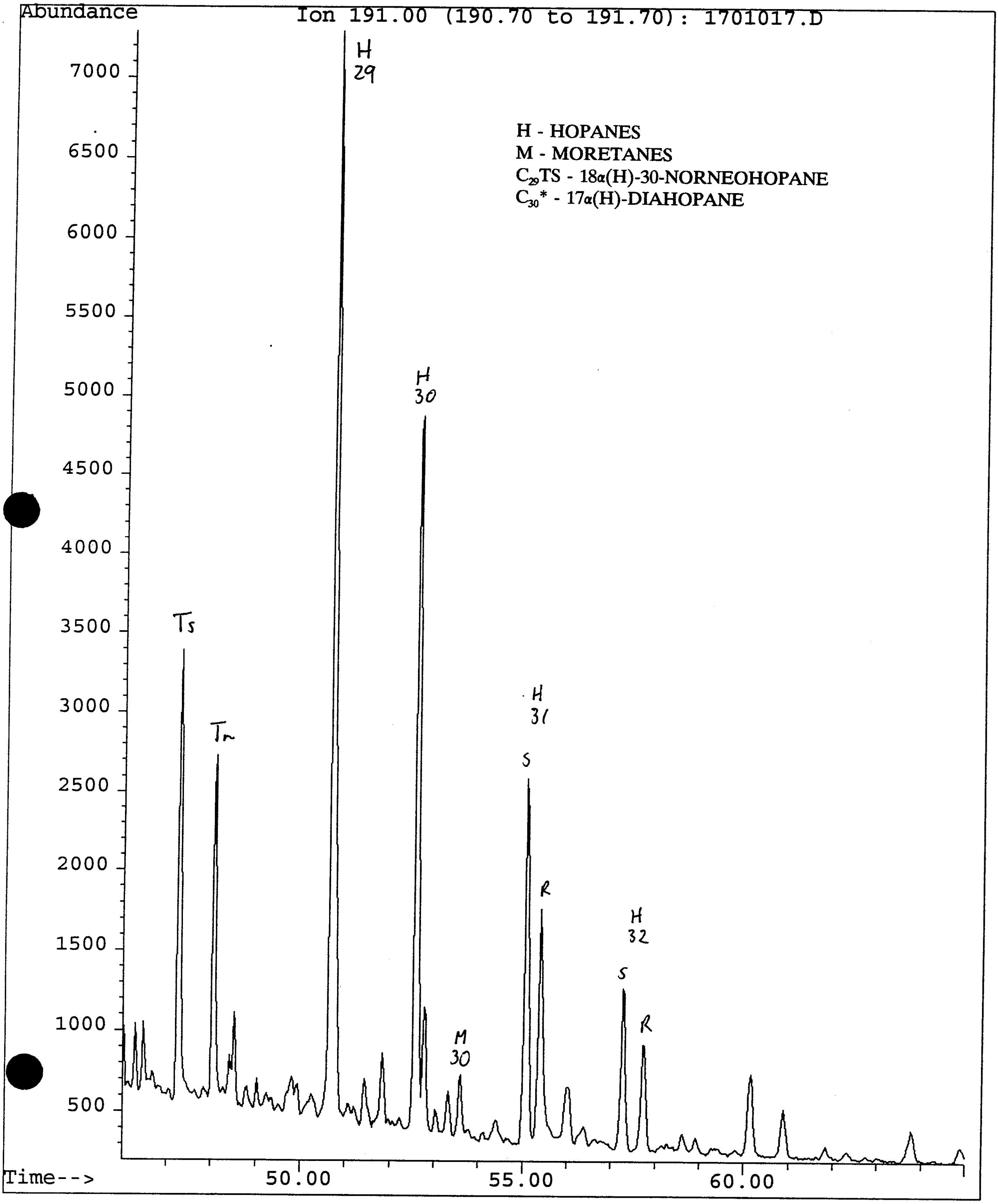
File: C:\HPCHEM\1\DATA\PETSERV\050894\1701017.D
Operator: Scott Wythe
Date Acquired: 6 Aug 94 10:42 am
Instrument: AMDEL-597
Method File: NAPHTH
Sample Name: MYLOR-1, DST-1 CONDENSATE
Misc Info:
Vial Number : 17



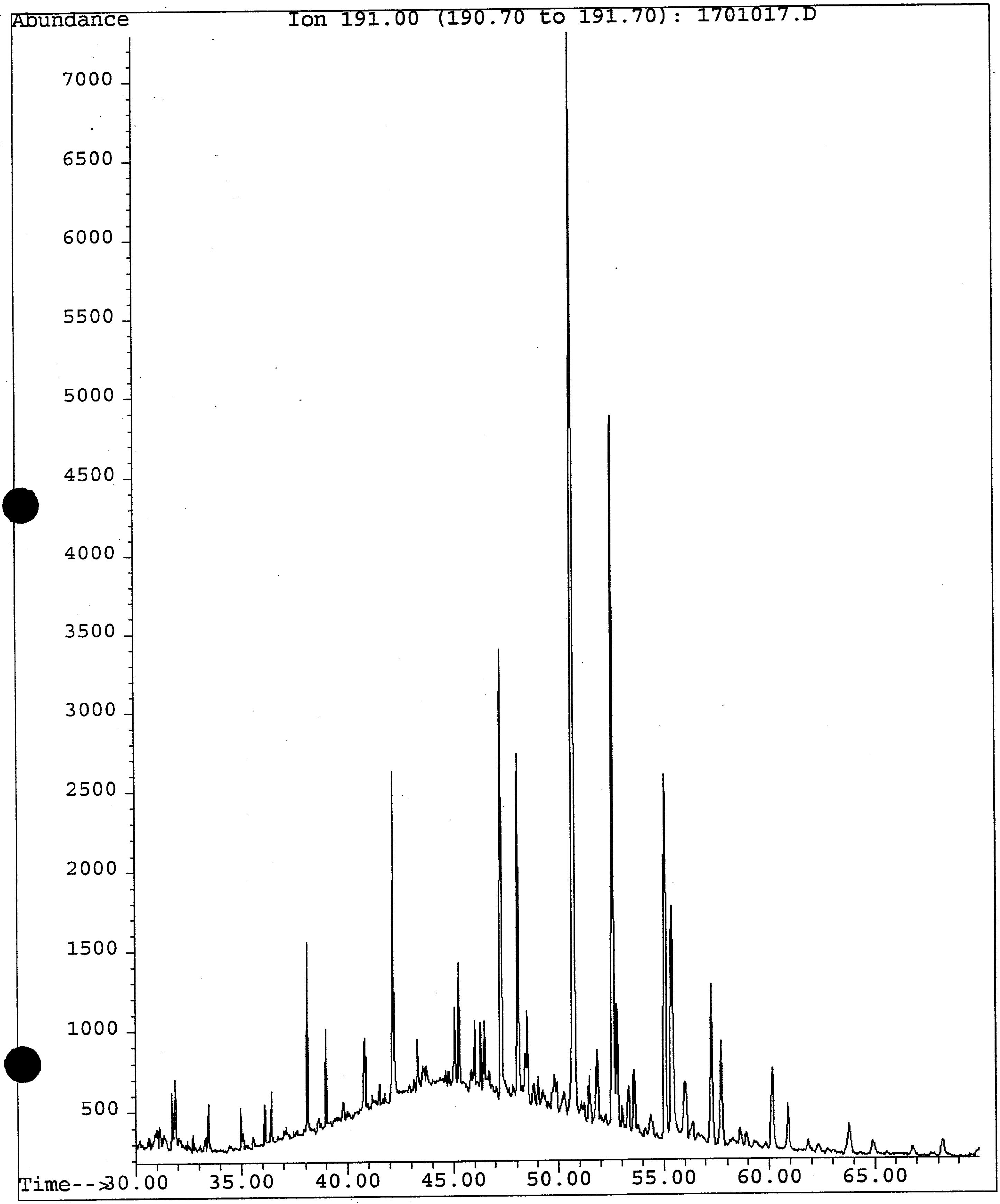




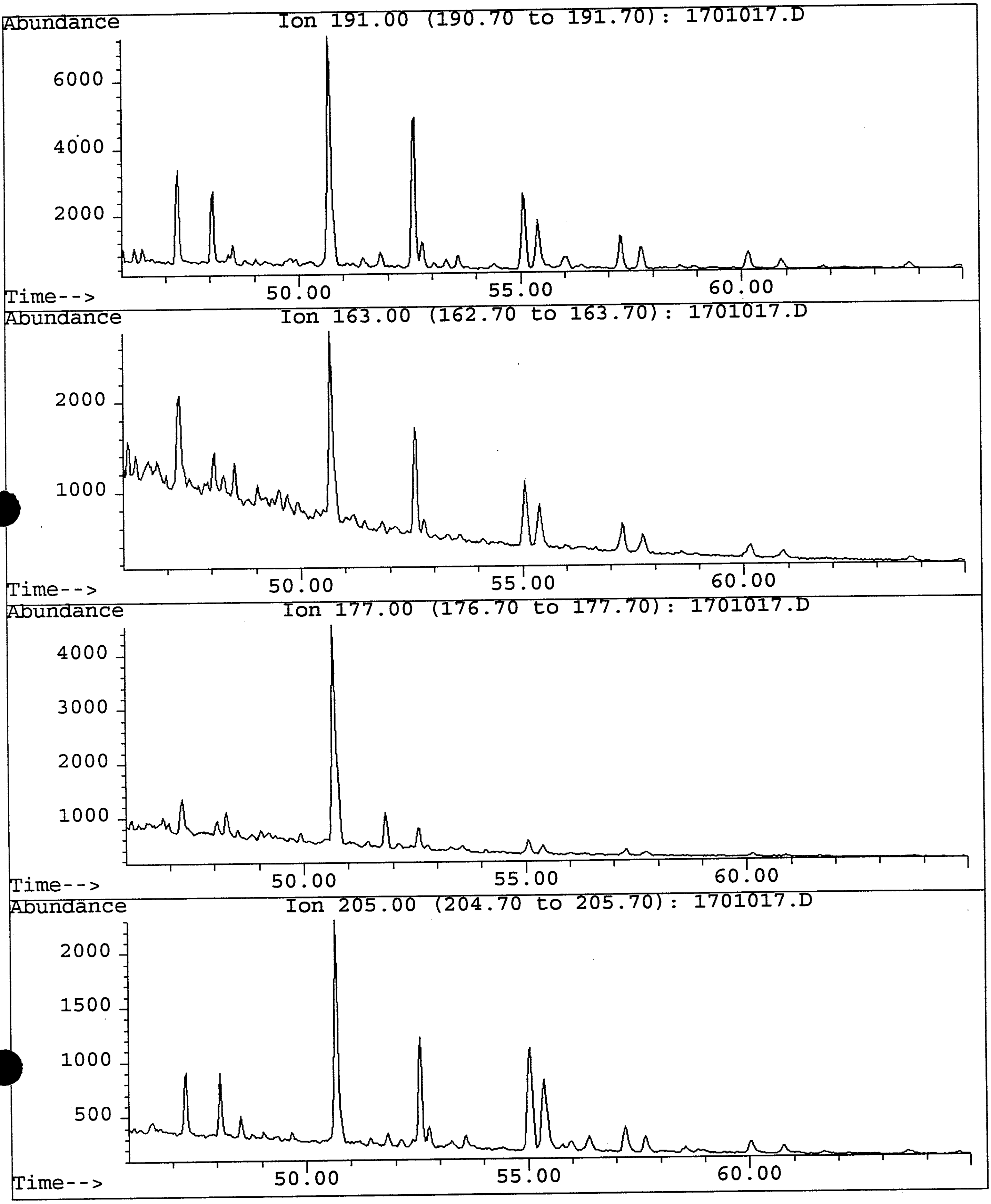
File: C:\HPCHEM\1\DATA\PETSERV\050894\1701017.D
Operator: Scott Wythe
Date Acquired: 6 Aug 94 10:42 am
Instrument: AMDEL-597
Method File: NAPHTH
Sample Name: MYLOR-1, DST-1 CONDENSATE
Misc Info:
Vial Number : 17



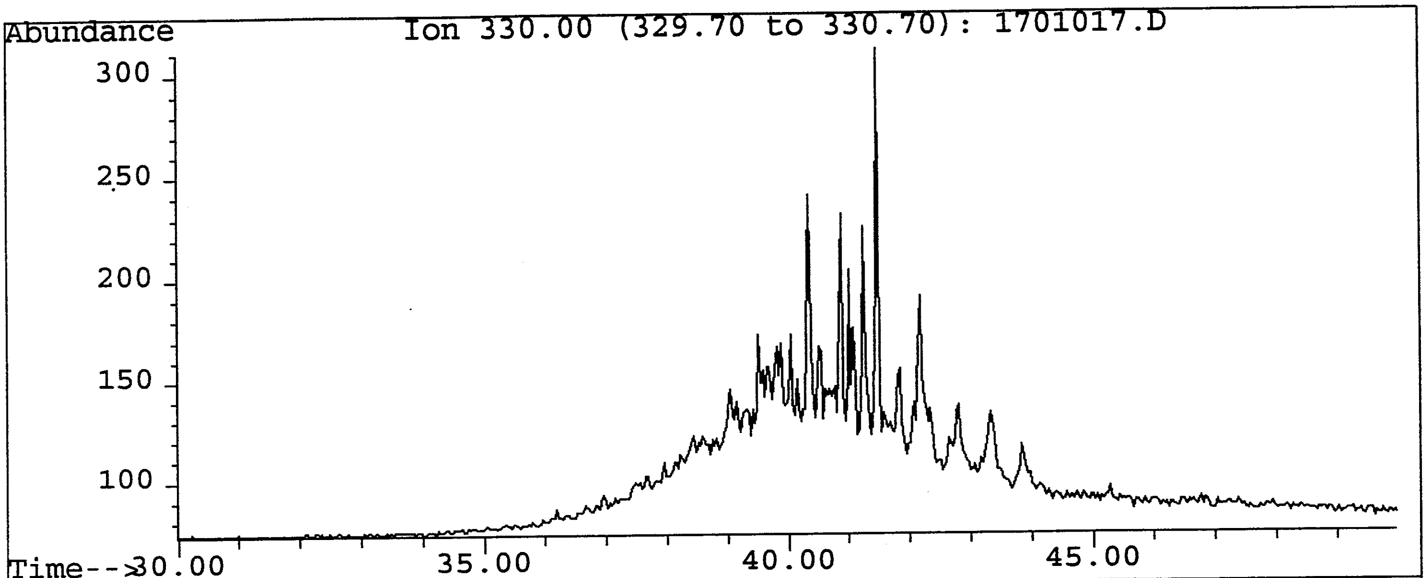
File: C:\HPCHEM\1\DATA\PETSERV\050894\1701017.D
Operator: Scott Wythe
Date Acquired: 6 Aug 94 10:42 am
Instrument: AMDEL-597
Method File: NAPHTH
Sample Name: MYLOR-1, DST-1 CONDENSATE
Misc Info:
Vial Number : 17

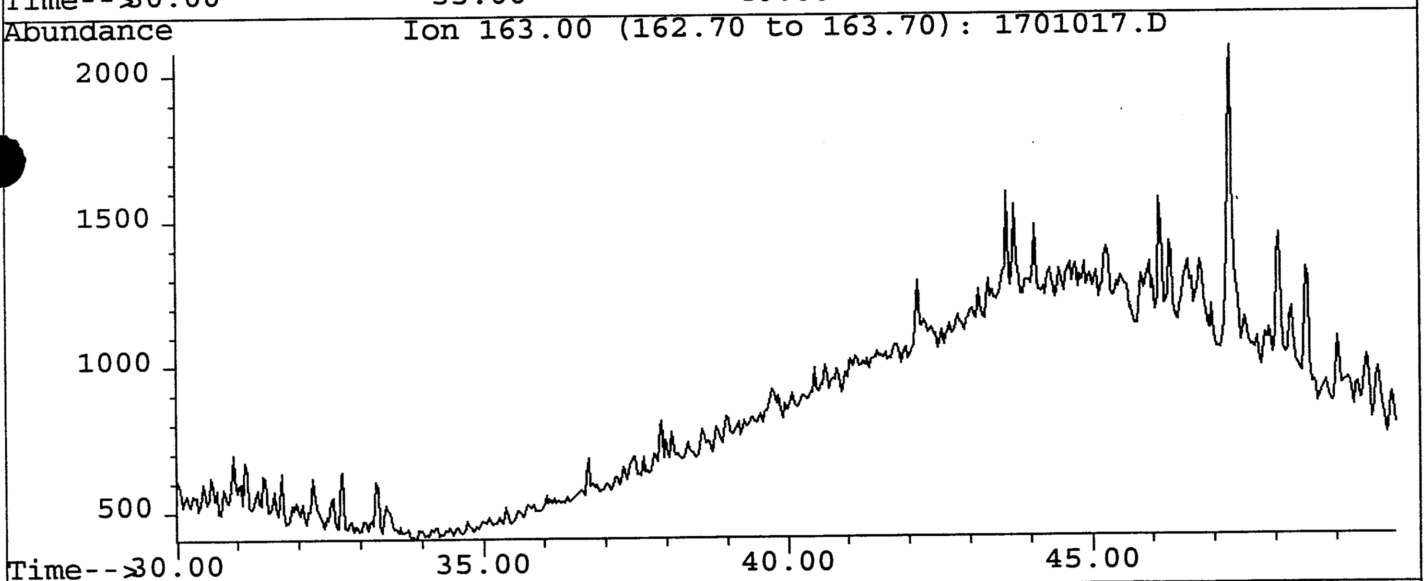


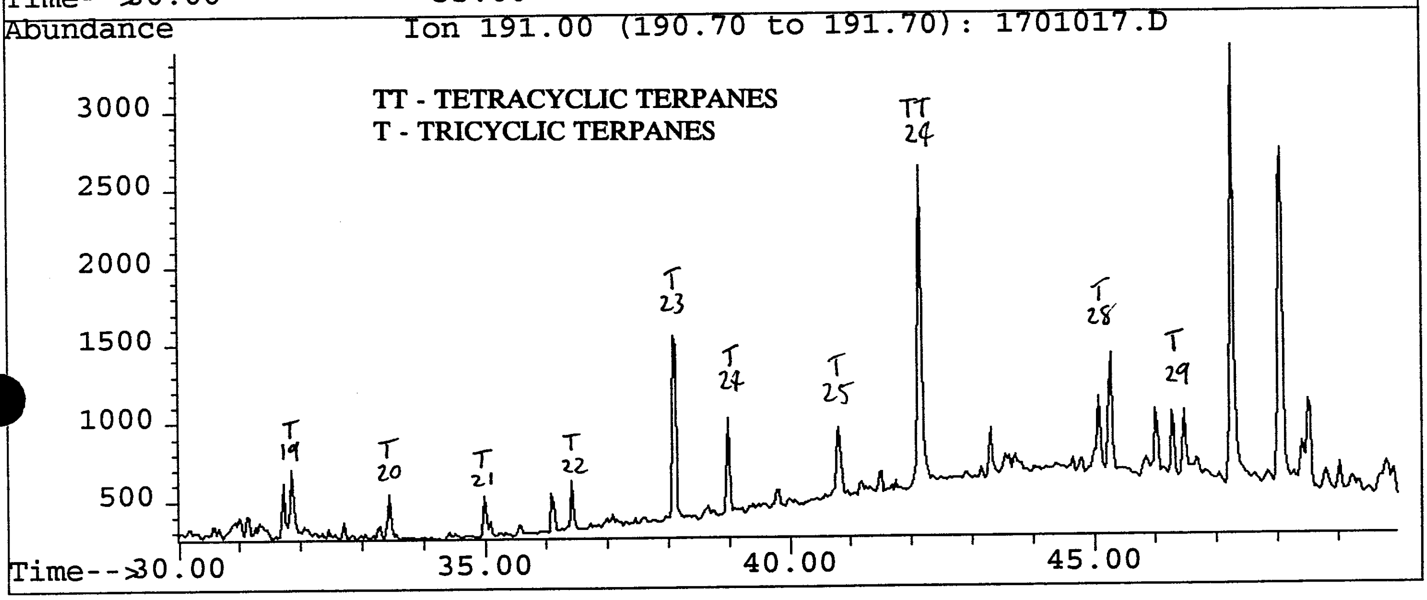
File: C:\HPCHEM\1\DATA\PETSERV\050894\1701017.D
Operator: Scott Wythe
Date Acquired: 6 Aug 94 10:42 am
Instrument: AMDEL-597
Method File: NAPHTH
Sample Name: MYLOR-1, DST-1 CONDENSATE
Misc Info:
Vial Number : 17



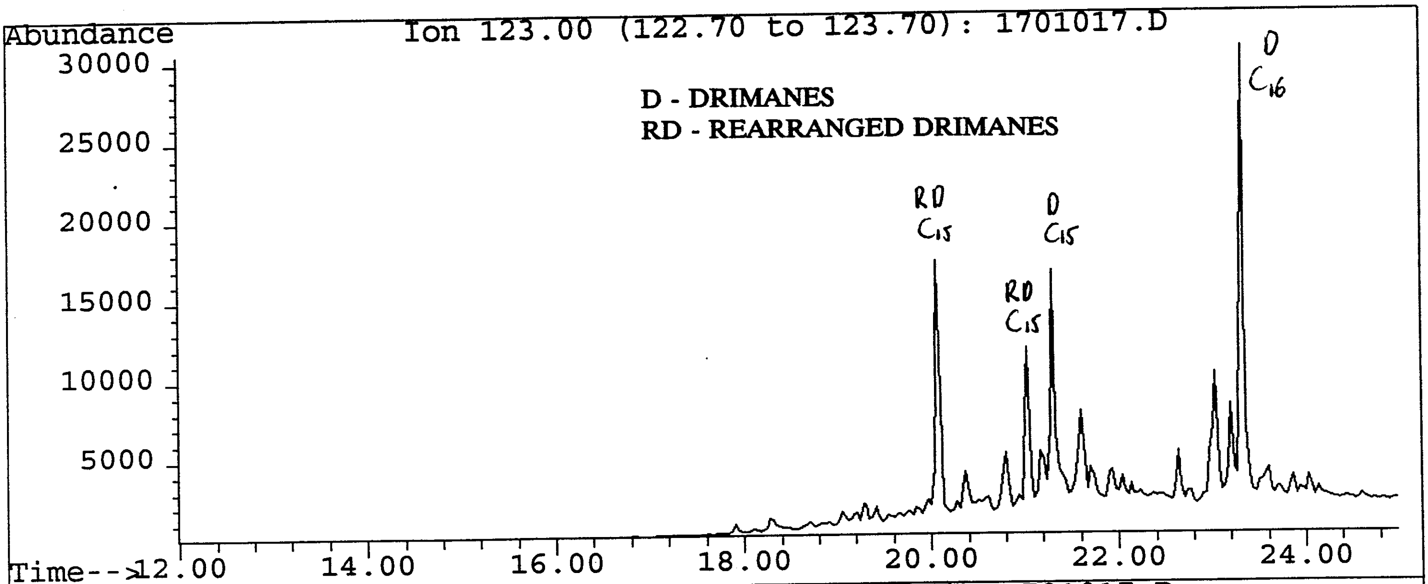
File: C:\HPCHEM\1\DATA\PETSERV\050894\1701017.D
Operator: Scott Wythe
Date Acquired: 6 Aug 94 10:42 am
Instrument: AMDEL-597
Method File: NAPHTH
Sample Name: MYLOR-1, DST-1 CONDENSATE
Misc Info:
Vial Number : 17

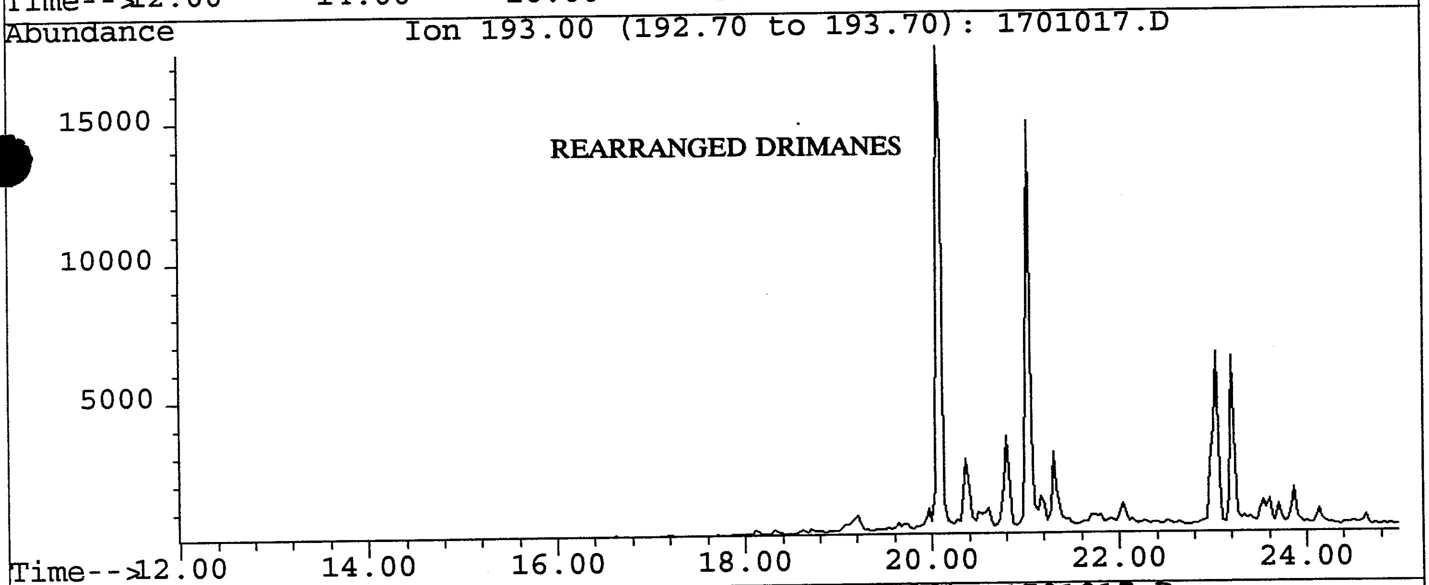


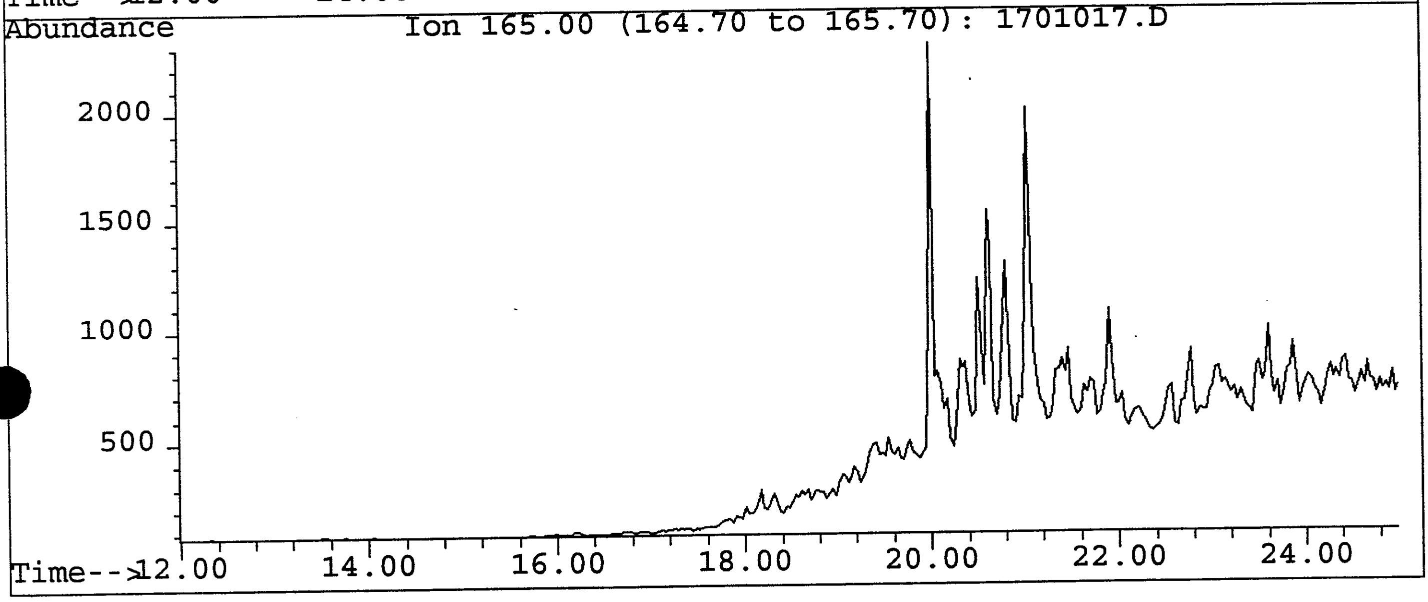




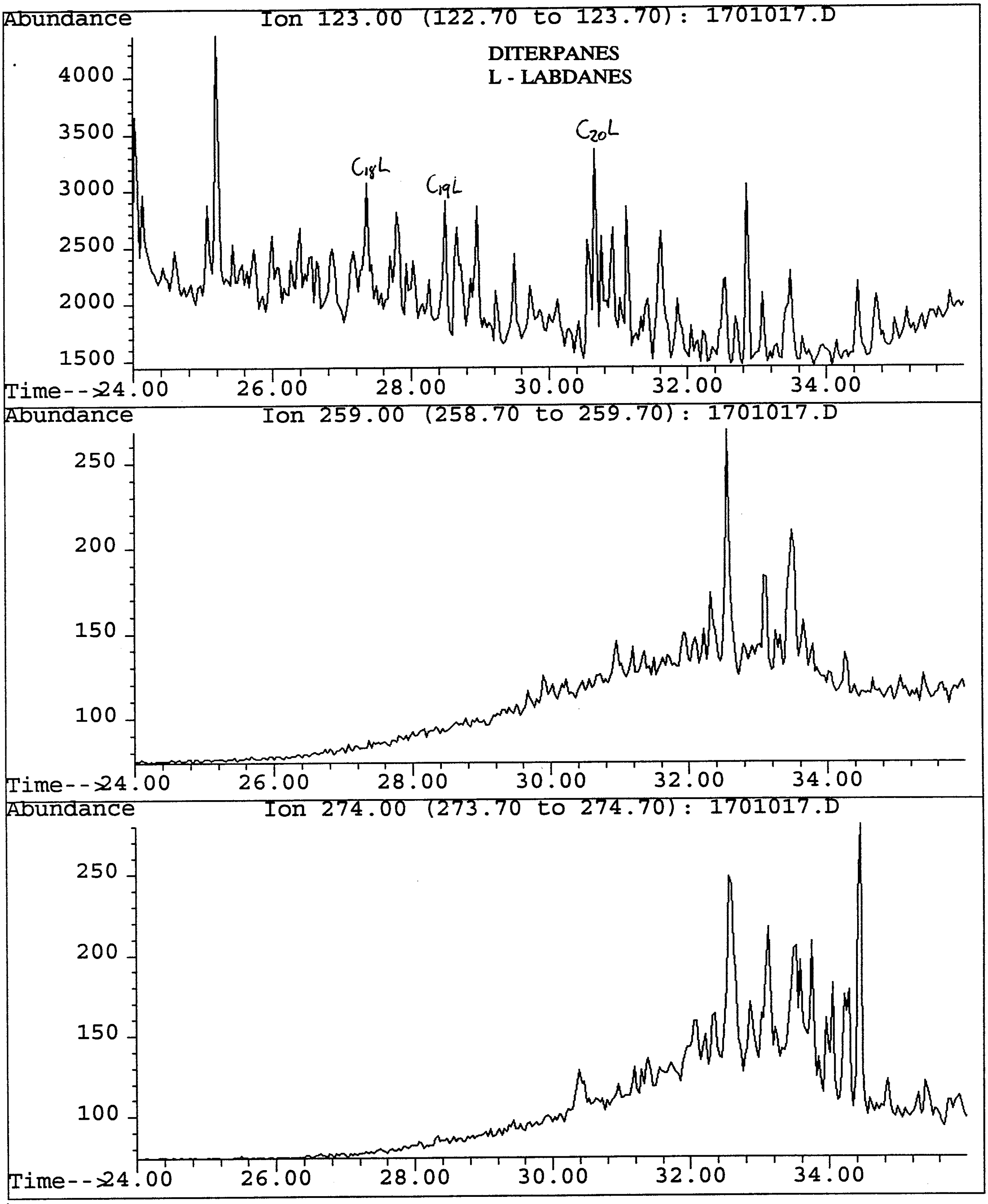
File: C:\HPCHEM\1\DATA\PETSERV\050894\1701017.D
Operator: Scott Wythe
Date Acquired: 6 Aug 94 10:42 am
Instrument: AMDEL-597
Method File: NAPHTH
Sample Name: MYLOR-1, DST-1 CONDENSATE
Misc Info:
Vial Number : 17



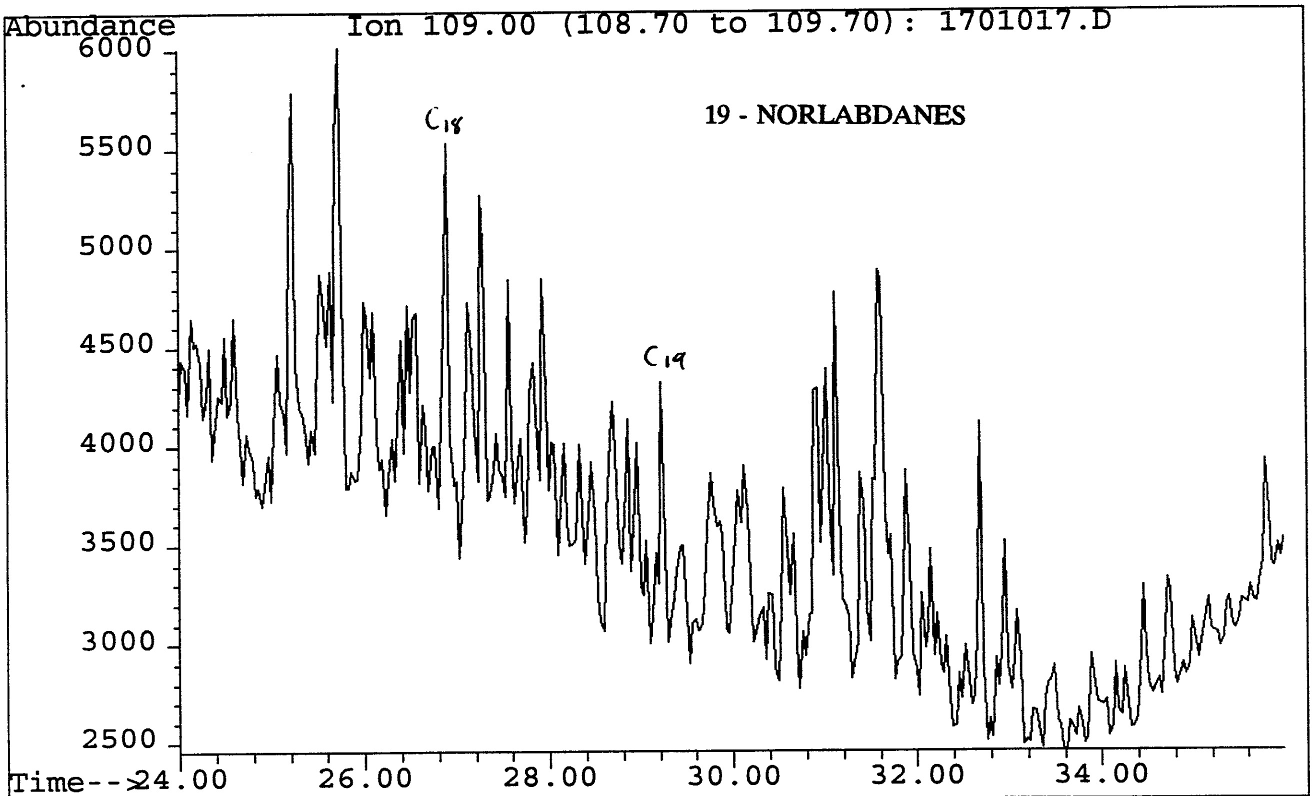


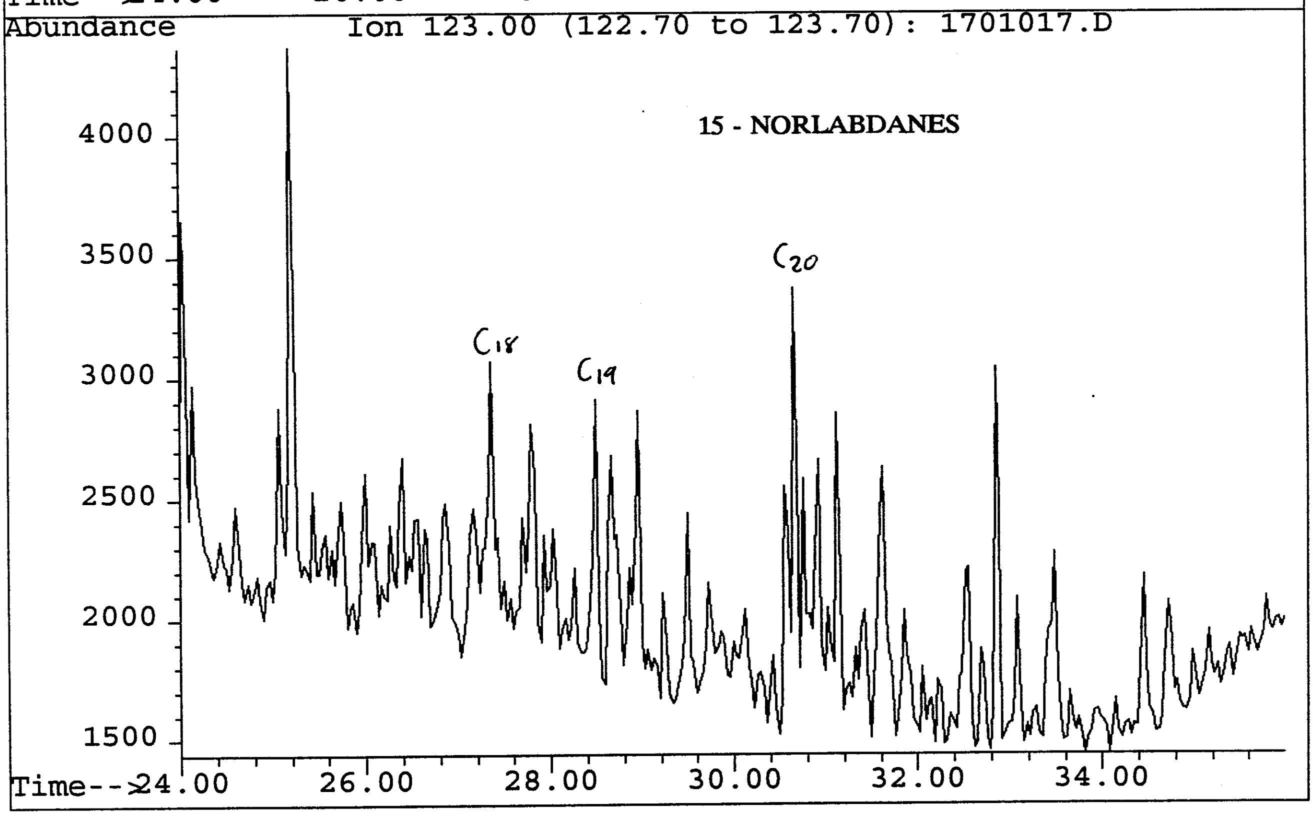


File : C:\HPCHEM\1\DATA\PETSERV\050894\1701017.D
Operator : Scott Wythe
Acquired : 6 Aug 94 10:42 am using AcqMethod NAPHTH
Instrument : AMDEL-597
Sample Name: MYLOR-1, DST-1 CONDENSATE
Misc Info :
Vial Number: 17

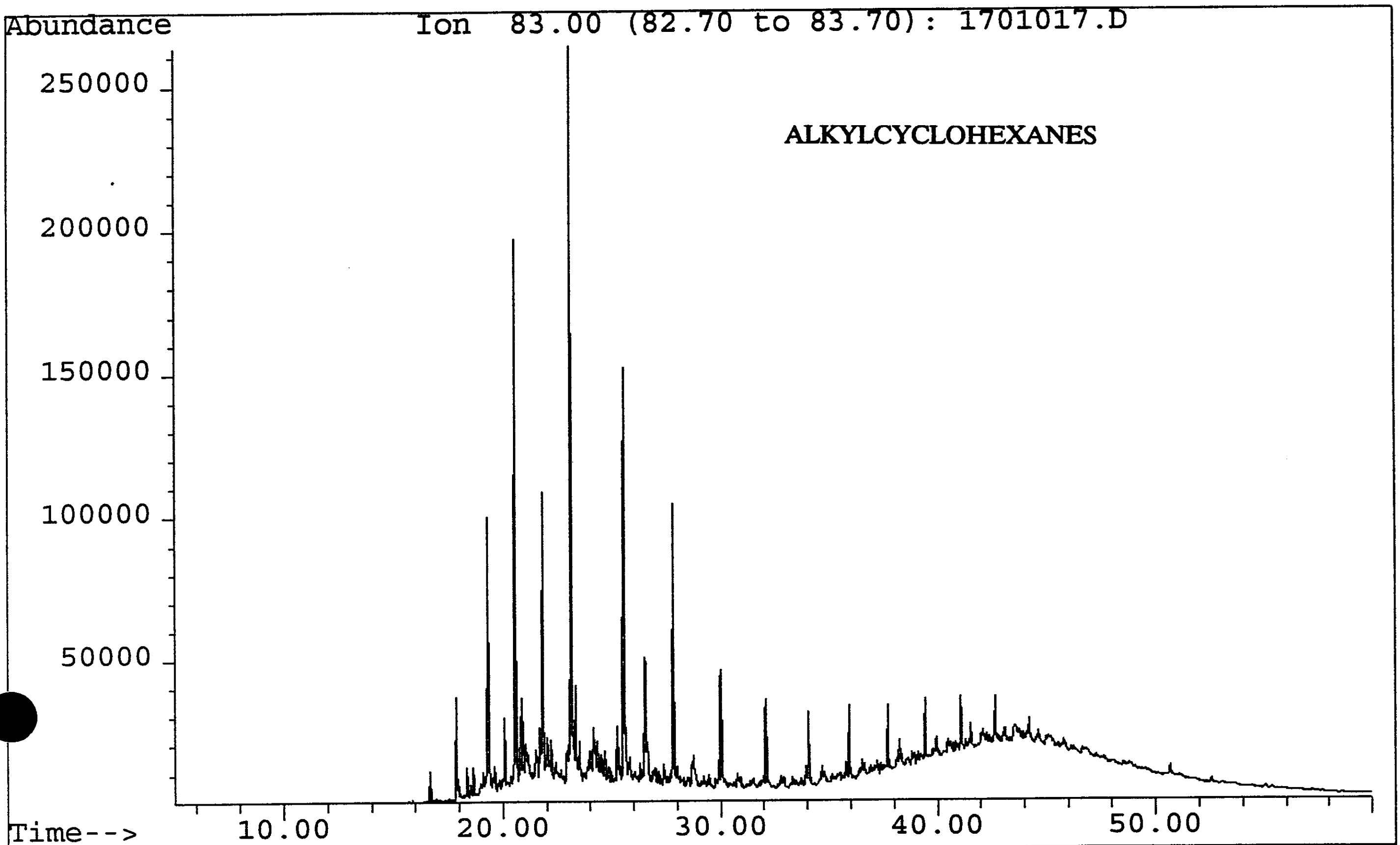


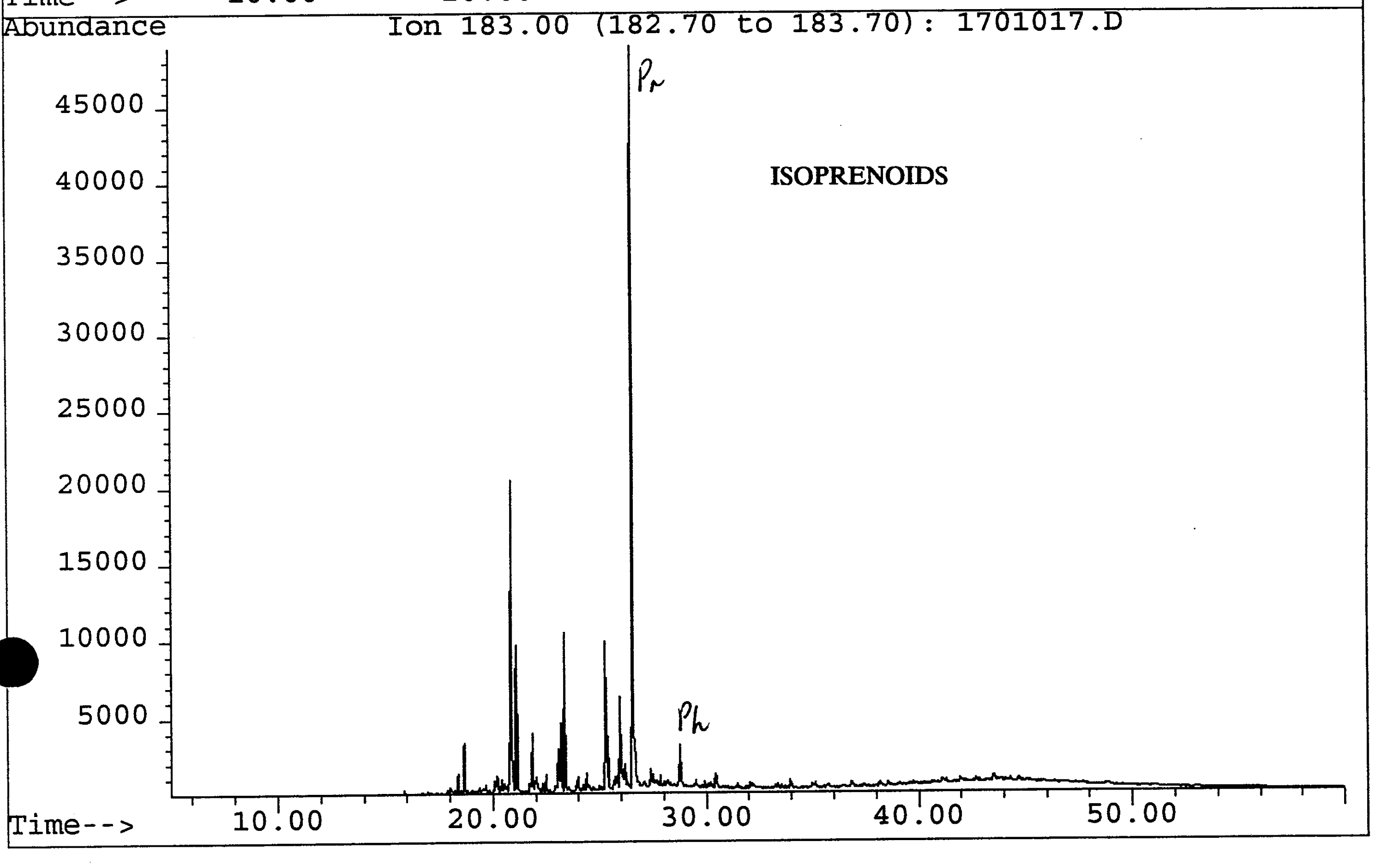
File : C:\HPCHEM\1\DATA\PETSERV\050894\1701017.D
Operator : Scott Wythe
Acquired : 6 Aug 94 10:42 am using AcqMethod NAPHTH
Instrument : AMDEL-597
Sample Name: MYLOR-1, DST-1 CONDENSATE
Misc Info :
Vial Number: 17





File: C:\HPCHEM\1\DATA\PETSERV\050894\1701017.D
Operator: Scott Wythe
Date Acquired: 6 Aug 94 10:42 am
Instrument: AMDEL-597
Method File: NAPHTH
Sample Name: MYLOR-1, DST-1 CONDENSATE
Misc Info:
Vial Number : 17

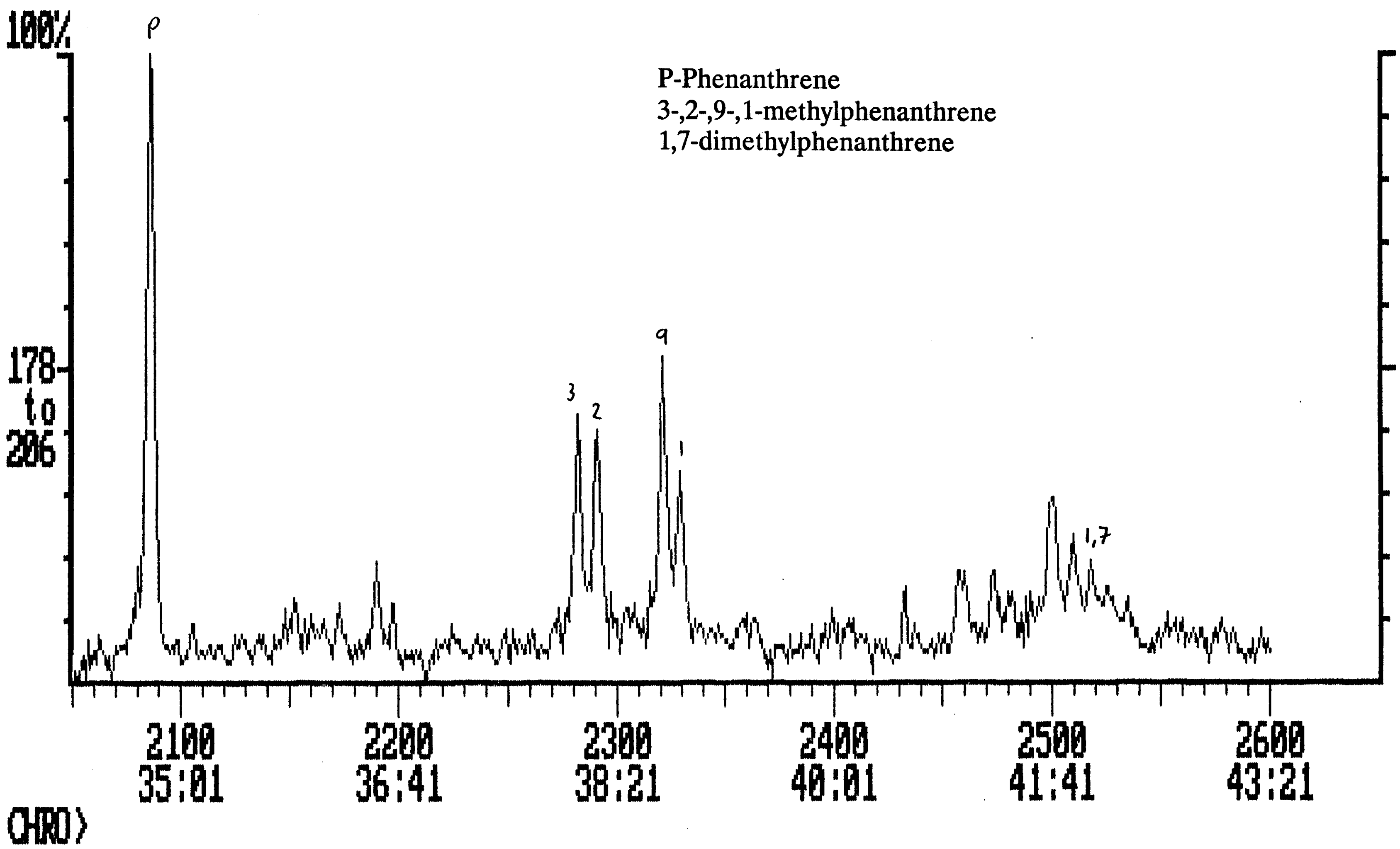




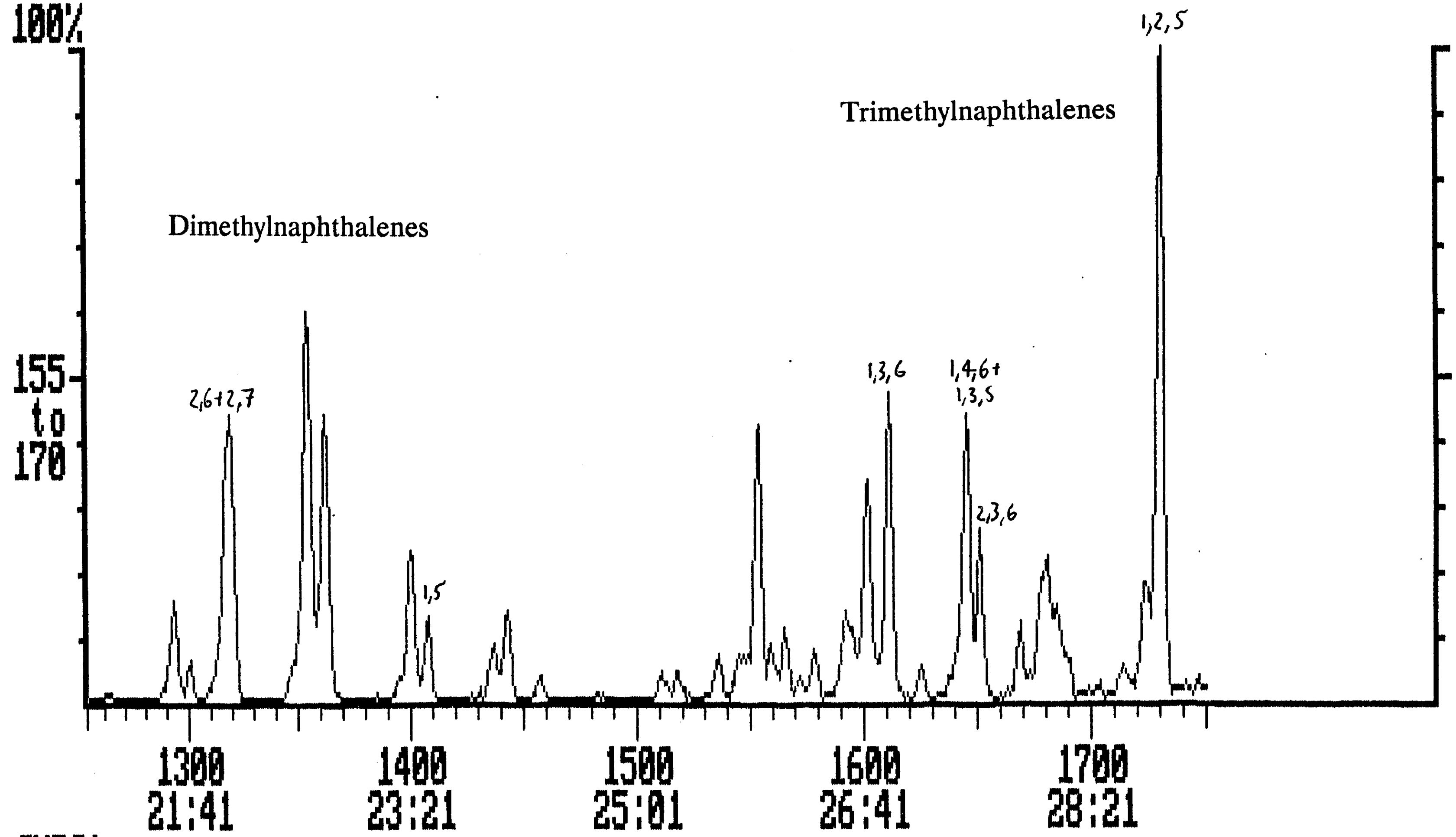
APPENDIX 5

GC-MS OF AROMATIC HYDROCARBONS

Chromatogram D:APS347 Acquired: Jul-05-1994 14:09:57
Comment: MPI BRIDGE OIL MYLOR-1, DST-1 CONDENSATE AMDEL PETROLEUM SERVICES
Scan Range: 2050 - 2600 Scan: 2050 Int = 327 @ 34:11 100% = 2389



Chromatogram D:APS347 Acquired: Jul-05-1994 14:09:57
Comment: MPI BRIDGE OIL MYLOR-1, DST-1 CONDENSATE AMDEL PETROLEUM SERVICES
Scan Range: 1250 - 1750 Scan: 1250 Int = 0 @ 20:51 100% = 25449



CHRO>

ENCLOSURES

ENCLOSURES

1. Mud Log

PE 600746

PE600746

This is an enclosure indicator page.
The enclosure PE600746 is enclosed within the container PE900935 at this location in this document.

The enclosure PE600746 has the following characteristics:

ITEM_BARCODE = PE600746
CONTAINER_BARCODE = PE900935
NAME = Formation Evaluation Log/Mud Log
BASIN = OTWAY
PERMIT = PEP 108
TYPE = WELL
SUBTYPE = WELL_LOG
DESCRIPTION = XL Base Formation Evaluation/ Mud Log (enclosure 1 from WCR vol.2) for Mylor-1
REMARKS =
DATE_CREATED = 24/06/94
DATE_RECEIVED =
W_NO = W1102
WELL_NAME = Mylor-1
CONTRACTOR = Baker Hughes Inteq
CLIENT_OP_CO = Bridge Oil Ltd

(Inserted by DNRE - Vic Govt Mines Dept)

ENCLOSURES

2. Core Photographs

PE900936

PE906755

PE900936

This is an enclosure indicator page.
The enclosure PE900936 is enclosed within the container PE900935 at this location in this document.

The enclosure PE900936 has the following characteristics:

ITEM_BARCODE =	PE900936
CONTAINER_BARCODE =	PE900935
NAME =	Core Photographs
BASIN =	OTWAY
PERMIT =	PEP 108
TYPE =	WELL
SUBTYPE =	CORE_PHOTOS
DESCRIPTION =	Core Photographs - (enclosure 2 from WCR vol.2) for Mylor-1
REMARKS =	The photographs have been stuck together to form a core log.
DATE_CREATED =	
DATE_RECEIVED =	
W_NO =	W1102
WELL_NAME =	Mylor-1
CONTRACTOR =	Bridge Oil Limited
CLIENT_OP_CO =	Bridge Oil Ltd

(Inserted by DNRE - Vic Govt Mines Dept)

PE906755

This is an enclosure indicator page.
The enclosure PE906755 is enclosed within the container PE900935 at this location in this document.

The enclosure PE906755 has the following characteristics:

ITEM_BARCODE =	PE906755
CONTAINER_BARCODE =	PE900935
NAME =	UV Core Photographs
BASIN =	OTWAY
PERMIT =	PEP108
TYPE =	WELL
SUBTYPE =	CORE_PHOTOS
DESCRIPTION =	UV Core Photographs for Mylor-1
REMARKS =	Plastic Strip of Photos
DATE_CREATED =	
DATE_RECEIVED =	23/03/95
W_NO =	W1102
WELL_NAME =	MYLOR-1
CONTRACTOR =	
CLIENT_OP_CO =	BRIDGE OIL LIMITED

(Inserted by DNRE - Vic Govt Mines Dept)

ENCLOSURES

3. Composite Log

PE600747

PE600747

This is an enclosure indicator page.
The enclosure PE600747 is enclosed within the container PE900935 at this location in this document.

The enclosure PE600747 has the following characteristics:

ITEM_BARCODE = PE600747
CONTAINER_BARCODE = PE900935
NAME = Composite Log
BASIN = OTWAY
PERMIT = PEP 108
TYPE = WELL
SUBTYPE = COMPOSITE_LOG
DESCRIPTION = Composite Log (enclosure 3 from WCR vol.2) for Mylor-1
REMARKS =
DATE_CREATED = 28/06/94
DATE_RECEIVED =
W_NO = W1102
WELL_NAME = Mylor-1
CONTRACTOR = Parker & Parsley Australasia Ltd
CLIENT_OP_CO = Bridge Oil Ltd

(Inserted by DNRE - Vic Govt Mines Dept)

ENCLOSURES

4. Mylor #1 Discovery Montage

PE900937

PE900937

This is an enclosure indicator page.
The enclosure PE900937 is enclosed within the container PE900935 at this location in this document.

The enclosure PE900937 has the following characteristics:

ITEM_BARCODE =	PE900937
CONTAINER_BARCODE =	PE900935
NAME =	Seismic Line - Discovery Montage
BASIN =	OTWAY
PERMIT =	PEP 108
TYPE =	WELL
SUBTYPE =	MONTAGE
DESCRIPTION =	Seismic Line 7005, Trace 1795 Waarre 3D - Discovery Montage (enclosure 4 from WCR vol.2) for Mylor-1
REMARKS =	Very Large Colour Seismic Chart
DATE_CREATED =	
DATE_RECEIVED =	
W_NO =	W1102
WELL_NAME =	Mylor-1
CONTRACTOR =	
CLIENT_OP_CO =	Bridge Oil Ltd

(Inserted by DNRE - Vic Govt Mines Dept)