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Contractor	Global Marine
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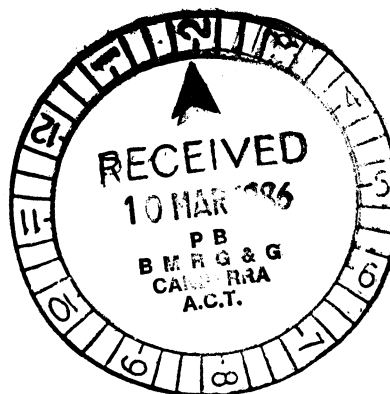
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1/2/86
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YOLLA -1
FINAL WELL REPORT
VOLUME 1 - GEOLOGY
JANUARY, 1986

B.F. WHEELER
G.M. KJELLGREN



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and Dr.A. Webb
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Dr. A. Webb
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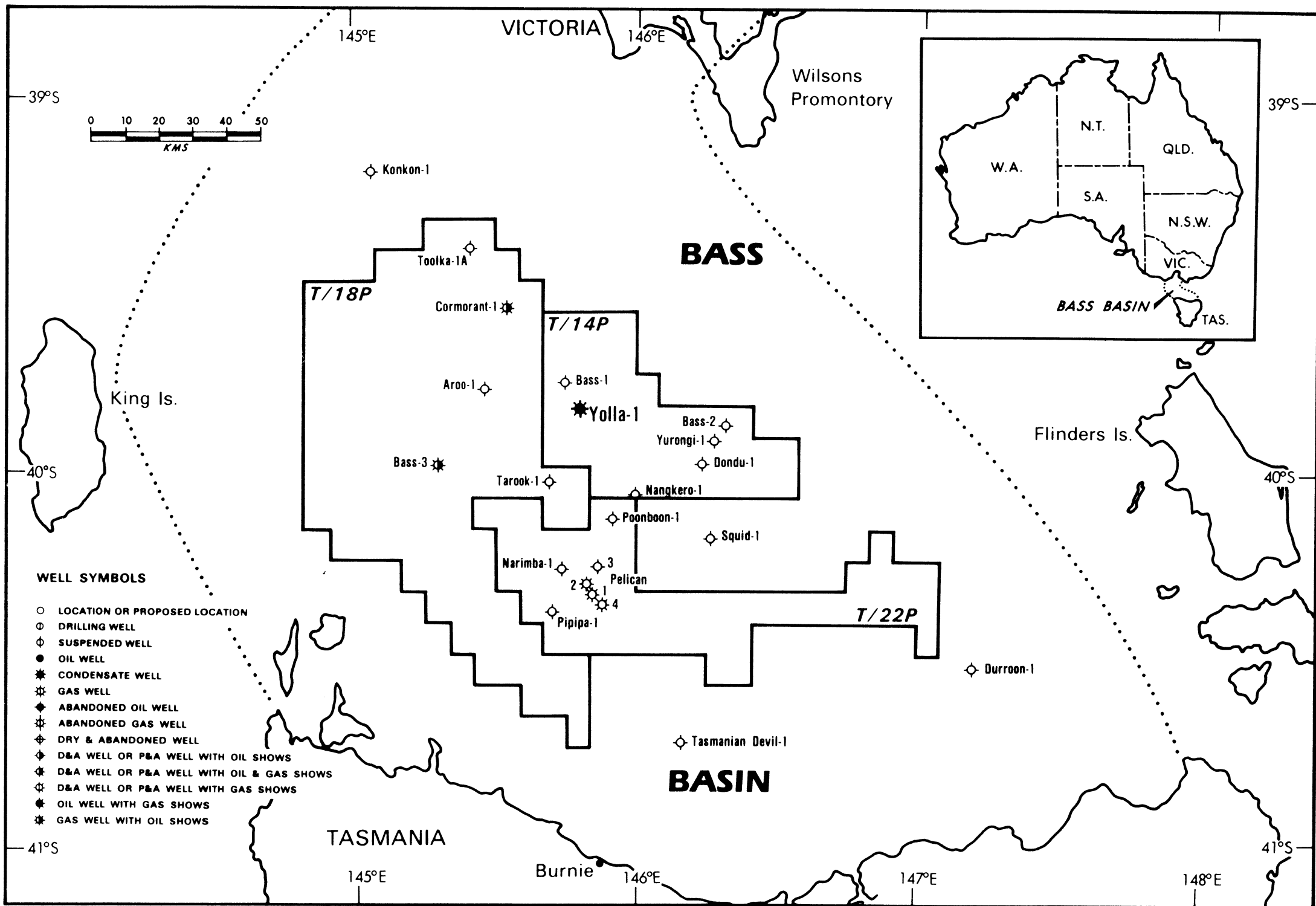
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SUMMARY

Yolla-1, the first exploration well drilled in the Bass Basin by Amoco Australia Petroleum Company, was spudded in the T/14P permit approximately 130 km from the northern Tasmanian coastline on June 8th, 1985. The well was drilled as a vertical hole to a total depth of 3347 m to test early Eocene through early Paleocene non-marine and marginal marine sandstones of the Eastern View Coal Measures (EVCN) in a faulted basement high structure with four-way dip and fault-associated areal closure (see enclosure 1).

Hydrocarbons were recorded in the Angahook Formation with minor oil fluorescence and gas over the interval 1260 m to 1450 m with traces of crush cuts to 1560 m.

Within the upper part of the EVCN trace crush cuts were observed from 1814 m to 1831 m, whereupon good light oil shows and associated gas were drilled to 1838 m in excellent porous sands. Core No.1 was cut from 1838 m to 1848 m but recovery was very poor due to the friable nature of the sands; nevertheless 2.8 m of evenly oil-stained sandstone was recovered. Good oil shows continued to 1856 m.

A sequence of interbedded sandstones, shales and coals was drilled to 3031 m before penetrating a thick unit of basalts to T.D. Core No.2 was cut in basalt at T.D. A number of extrusive and intrusive igneous rocks were intersected throughout this sequence, the thickest being a doleritic/gabbroic intrusive of Late Oligocene to Early Miocene age extending from 2584 m to 2651 m. A number of sands within the lower part of the EVCN exhibited very good reservoir characteristics and had good oil shows with associated gas.

The most promising hydrocarbon shows within Yolla-1 were drillstem tested through casing. These were all located within the EVCN as the shows within the Angahook Formation were not considered worthy of testing.

Within the Late Paleocene interval of the EVCN (2809.1 m to 2814.2 m and 2817.9 m to 2824.6m) up to 15.1 mmcfd and 580 bcpd was recovered on 40/64" choke. The upper part of the EVCN produced both oil, condensate and gas on two separate tests - 1833.2 m to 1833.8 m produced 1.02 mmcfd and 302 bopd on 16/64" choke whilst the zone 1813 m to 1833.1 m produced 11.8 mmcfd and 892 bcpd. Log analyses confirm 58 m of net pay in Yolla-1.

On October 11, 1985, 129 days after spud, Yolla-1 was suspended for possible re-entry.

WELL SUMMARY SHEET

COMPANY:	AMOCO AUSTRALIA PETROLEUM COMPANY	WELL:	YOLLA-1	ISSUED:	NOVEMBER, 1985
SUDDDED:	8 JUNE 1985	BASIN:	BASS BASIN	REVISED:	
DATE T.D.:	21 AUGUST 1985	PERMIT:	T/14P	BY:	BFW
RIG RELEASED:	11 OCTOBER 1985	LATITUDE:	39°50' 18.89" SOUTH		
TOTAL OPERATING TIME:	129 DAYS	LONGITUDE:	145° 48' 20.55" EAST		
DRILLING CONTRACTOR/RIG:	GLOBAL MARINE/GLOMAR "ROBERT F BAUER"	S.P.:	197		
TOTAL DEPTH:	3347M	LINE:	HB73A-169		
WATER DEPTH:	~79M	STATUS:	SUSPENDED		
KELLY BUSHING:	11.1M				

FORMATION	LOG	RKB(m)	SUBSEA(m)	T.W.T.(msec)	LITHOLOGIC SUMMARY	REMARKS/SHOWS
SEAFLOOR (TORQUAY GROUP)		90	79.0	-	BIOCLASTIC LIMESTONES WITH DECREASING GRAIN SIZE AND INCREASING CLAY WITH DEPTH.	NO SHOWS
ANGAHOOK FORMATION		1053	1041.9	920	CALCAREOUS CLAYSTONE BECOMING SANDY WITH DEPTH. VOLCANOGENIC MATERIAL IN MIDDLE OF UNIT.	OCCASIONAL ZONES WITH GOOD OIL FLUORESCENCE AND ASSOCIATED GAS
DEMONS BLUFF FORMATION		1668	1656.9	1375	DARK ANOIXIC CLAYSTONES WITH OCCASIONAL SANDSTONES.	NO SHOWS
EASTERN VIEW COAL MEASURES		1799	1787.9	1468	INTERBEDDED SANDSTONES, SHALES, SILTSTONES, COALS AND OCCASIONAL DOLOMITES	GOOD OIL SHOWS WITH ASSOCIATED GAS PEAKS
- TOP GABBRO/DOLERITE		2584	2572.9	1942		
- BASE GABBRO/DOLERITE		2651	2639.9	1978	FINE TO COARSE CRYSTALLINE DOLERITE CUM GABBRO	NO SHOWS
TOP VOLCANICS		3031	3019.9	2170	ALTERED AMYGDALOIDAL BASALT	NO SHOWS
TOTAL DEPTH		3351	3339.9	2332		

	NO.	DEPTH (m)	CUT (m)	REC (m)	LITHOLOGY	REMARKS/SHOWS
C O R E S	1	1838-1848M	10	2.8	v f gr SST w/ thin lam of Clyst. 25-31% porosity; 11-204md permeability	Even lt brn oil stain, even med gold yel fluor, mod petrol odor.
	2	3344.7-3346.8	2.1	1.4	Altered amygdaloidal basalt	

DITCH CUTTINGS	From (m)	To (m)	SIDEWALL CORES:	SUITE NO.	RUN NO.	FROM (m)	TO (m)	SHOT	RECOVERED
	195	3347		3	1	3028	1765	51	48

L O G S	SUITE 1: (1758-399m; GR to seabed) 9 July ISF-BHC-MSFL-GR-SP-Cal (Run 1)	SUITE 2: (1982-1752m) 19 July ISF-BHC-MSFL-GR-SP-Cal (Run 2) LDL-CNL-GR (Run 1)	SUITE 3: (3347-1752m) 22 to 31 August ISF-BHC-MSFL-GR-SP-Cal (Run 3) LDL-CNL-NGT-EPT (Run 2) HDT (Run 1) RFT (Run 1,2,3,4,5) CST (Run 1) Rec 48 of 51 VSP (Run 1) (10 to 11 September)
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C A S I N G	SIZE (inches x lb/ft)	30x	20x (16 joints @ 94; 10 joints @ 129)	13 3/8x (23 joints @ 72; 117 joints @ 68)	9 5/8x 47
	LANDED AT'(m)	189	399	1752	3340M
	CEMENT (Sacks)	2000	1900	2200	2411

DRILLSTEM TESTS (LOG DEPTHS)

DST NO. 1: Perf 2809.1-2814.2m	DST NO. 2: Perf 1830-1835.2m	DST NO. 2A: Perf 1833.2-1833.8m
2817.9-2824.6m	46/64" choke: 3.4 mmcf	16/64" choke: 1.02 mmcf
30/64" choke: 10.2 mmcf	32/64" choke: 2.2 mmcf	302 bopd (45.5° API)
420 bcpd (50.5° API)	1675 bwpd	DST NO. 3: 1813-1833.1
40/64" choke: 15.1 mmcf		80/64" choke: 11.8 mmcf
580 bcpd (51.2° API)		892 bcpd (50.6° API)
RFT: 2988m		
ISIP 4392 psj		
Rec. 47.7ft gas		
100cc condensate		
1500 cc water		
PLUGS:	NO.1: 3340 - 3315m	NO.3: 1931 - 1887m
	NO.2: 2806 - 2785m	NO.4: 1807 - 1527m
	EZSV's at 1205m, 910m.	

REMARKS:

Well suspended for possible re-entry

PREVIOUS WORK

PREVIOUS GEOLOGICAL WORK

Yolla-1 was drilled in the central part of the Bass Basin, in permit T/14P. Twenty-one petroleum exploration wells had been drilled previously, four of which have had significant hydrocarbon shows. Cormorant-1 recovered biodegraded oil and gas-condensate on formation interval tests, whilst Pelican-1, -2 and -4 recovered gas and condensate on formation interval and repeat formation tests. No drill stem or production tests have been performed to date in the Bass Basin.

The stratigraphic sequence in permit T/14P is believed to contain up to 4600 m of marginal marine and non-marine, early Cretaceous to late Eocene clastic sediments overlain by a late Eocene to Recent marine sequence up to 2100 m thick. The primary reservoir objectives are in sandstones within the late Cretaceous to late Eocene Eastern View Coal Measures (EVCN). The EVCN consists of sandstones interbedded with shales and coals deposited in nearshore marine to lacustrine environments.

PREVIOUS GEOPHYSICAL WORK

Geophysical surveys have been undertaken in the Bass Basin since 1960, with the more relevant surveys being shot during the years from 1972 to 1984. The last detail survey was that undertaken by Amoco Australia Petroleum Company in 1984. A number of lines from the previous surveys were reprocessed (324 km) to complement the Amoco 1984 TNK4 survey, in which 537 kms over T/14P were acquired.

Enclosure 1 shows the structure of Yolla at the EVCN level and the reprocessed line HB73A-169, on which Yolla-1 was drilled. The Yolla structure consists of both dip and associated fault closure below the top of the EVCN and is located at the intersection of two normal fault systems.

STRATIGRAPHY

Formations in Yolla-1 were determined utilising all available data including palynology, paleontology, lithology and wireline logs, and comparing these data to nearby wells where possible. Much of this information is presented graphically on the Composite Well Log (enclosure 3) and listed in the stratigraphic table below.

All depths quoted are log depths relative to the kelly bushing.

Stratigraphic Table

Formation	Top (mRKB)	Top (m Subsea)	Thickness (m)	Age
Seafloor	90.1	79	-	-
Torquay Group	?	?	963+	?Recent to Early Miocene
	(first sample 195m)			
Angahook Fm	1053	1041.9	615	Early Miocene to Earliest Oligocene
Demons Bluff Fm	1668	1656.9	131	Late Eocene
Eastern View Coal Measures	1799	1787.9	1232	Late Eocene to Early Paleocene
Igneous Intrusive	2584	2572.9	67	Early Miocene to Late Oligocene
Basalt	3031	3019.9	320+	Early Paleocene to ?Late Cretaceous
Total Depth	3351	3339.9	-	

Torquay Group (195 m to 1053 m)

The Torquay Group in Yolla-1 is Early Miocene to Middle Miocene and younger in age. It is composed of an upper carbonate section and a lower claystone section, the change in rock type being transitional below 700 m. Large (2 cm), loosely cemented fossils and fossil debris consisting dominantly of bryozoa, coral spicules and forams dominated the section from 195 m to 440 m. Fragment size decreased with depth to generally less than 0.25 cm. Abundant fragments exhibited light to medium green pelletal glauconite and finely crystalline clear to white calcite infilling pores and cavities. Grain and fragment size continued to decrease from 400 m where the section graded from biocalcirudites to biocalcarenites then to calcarenites at 535 m and calcilutites from 685 m to 720 m. Loose grains of quartz silt appeared below 500 m. As grain size decreased with depth; micrite and clay matrix increased. The rocks were extremely soft and dispersive in the drilling fluid creating, by 720 m, a light grey clayey micritic ooze with abundant fine to coarse grained calcareous grains and fragments.

The clay content increased below 730 m where the rock graded to very calcareous claystone. These very soft and dispersive light green-grey claystones continued to the base of the Torquay Group. Calcareous content decreased slowly with depth to approximately 15% at 880 m as both micrite, fossil and grain fragments diminished. Occasional mica flakes and trace amounts of clear, fine grained quartz sand appeared below 765 m. Trace amounts of dark green glauconite pellets and very fine black specks (heavy minerals?) occurred throughout the section. The claystones became slightly consolidated below 945 m.

Paleontologic analysis indicates that above 700 m the sediments resulted from high energy winnowing of biogenic sands in water depths of 30 m to 100 m. The section below 700 m was deposited in 90 m to 140 m of water where calcareous sediments were winnowed off a nearby bryozoan bank with associated clay influx.

Angahook Formation (1053 m to 1668 m)

The Angahook Formation was deposited from Earliest Oligocene to Early Miocene and can be divided into four lithologic units. The upper three units were deposited in the Early Miocene, whilst the lowermost unit, separated by a hiatus, was deposited in the Earliest Oligocene.

The uppermost unit from 1053 m to 1237 m consisted primarily of light coloured, slightly calcareous claystones which became firmer with depth and developed fissility below 1075 m. Sections occasionally became quite silty (up to 15%) with trace amounts of fine to medium grained quartz sand, especially below 1180 m. Minor amounts of mica and pyrite occurred throughout the section and finely disseminated carbonaceous material appeared below 1180 m.

The second unit, from 1237 m to 1305 m, consisted primarily of volcano-clastic material, sandstones and claystones with minor amounts of siltstone, especially at the base. The claystones continued from above and contained abundant embedded quartz silt and sand and small foraminifera. The volcanics were white to bluish grey and mottled with abundant alteration to clays and calcite and variable amounts of pyrite. They represent highly altered pyroclastics. Loose fine to coarse grained quartz was associated with the volcanoclastics but the first well developed sandstones in Yolla-1 only occurred below 1260 m. These were fine to very coarse grained, with rounded to angular quartz sands well cemented with clays, calcite and silica. They contained lithic grains, mafics, chert pebble fragments and pyrite nodules.

The third unit, from 1305 m to 1440 m, consisted primarily of sandstone with minor interbedded claystone. The sandstones were dominantly very fine to fine grained with abundant clay and calcite cement. They were generally very silty and commonly graded to siltstones. They contained abundant pyrite, glauconite, carbonaceous material and occasional mica below 1385 m. Finely interbedded with the sandstones were brown and grey-brown, soft claystones which contained variable amounts of embedded quartz silt and sand. They were generally slightly pyritic and had moderate amounts of carbonaceous material.

The lowermost unit of the Angahook Formation, extending from 1440 m to 1668 m, consists of thin stringers of medium to dark reddish-brown sandy dolomites and dolomitic limestones below 1620 m interbedded with fine grained dolomitic quartz sandstones and medium brown, silty and sandy

claystones. There was abundant biogenic pyrite which had undergone almost total oxidation to limonite in this unit suggesting a period of exposure and giving basis for the unconformity at the top.

Deposition of this unit is envisaged on a shallow continental shelf (30 m to 100 m water depth) in high energy conditions.

Demons Bluff Formation (1668 m to 1799 m)

The Demons Bluff Formation, of Late Eocene age, is dominantly a claystone section with thin interbeds of sandstone and dolomitic limestone. The claystones become characteristically darker and more reddish-brown with depth becoming almost black near the base. Arenaceous content, carbonaceous material, mica and pyrite also increase with depth. The sandstones are reddish-brown, very fine to fine grained and contain abundant reddish-tan clay, calcite and dolomite matrix. A trace amount of medium green glauconite was also noted.

Paleontologically, the top of the Demons Bluff corresponded with the incoming of distinct, fine grained, grey coloured specimens of morphologically simple arenaceous foraminifera and pyritic tubes and discs of biogenic origin. The unit was deposited in a barred basin, marginal marine environment in up to 30 m of water.

Eastern View Coal Measures (1799 m to 3031 m)

The section of Eastern View Coal Measures penetrated in Yolla-1 ranged in age from Late Eocene to Early Paleocene. The upper contact was gradational lithologically with the Demons Bluff Formation where the dark brown silty claystones became siltier and sandier and finally graded into clean, very fine grained sandstones of the EVCM, although a marked log character change occurs at the top of the EVCM.

The first sand package from 1817 m to 1858 m consists of very fine grained, angular, well sorted, very friable sandstone with minor amounts of non-calcareous clay matrix material. It contained abundant light green glauconite and had occasional dolomitic streaks. Core No.1 was cut within this unit. The sand package below this from 1861 m to 1898 m showed a marked increase in very fine micropyrte, glauconite, mica and relict feldspars. Medium to coarse grained loose quartz also appeared as well as the first coals which were penetrated between 1878 and 1887 m.

Palynological analyses suggest that the top of the Middle Miocene occurs at 1832 m and that the depositional environments vary from nearshore marine above to marginal marine below. This is consistent with the facies present in Core No.1.

A thick section of interbedded sandstones, coals and shales was penetrated from 1898 m to 2801 m which ranged in age from Middle to Early Eocene. The boundary between the Mid and Lower Eocene is placed between 2174 m and 2210 m. The base of the section at 2801 m marked the Early Eocene - Late Paleocene boundary.

Two types of sandstones were present; one was very fine grained, angular, moderately well sorted and friable and contained abundant white to tan clay matrix and variable amounts of mica, glauconite (?) and abundant dark brown to black carbonaceous and organic material as finely disseminated particles, wisps and microlaminations. The sandstone occasionally graded

silty and more argillaceous as the section also consisted of very finely interlaminated sandstones and shales. The other sandstone type ranged from fine to very coarse grained, with medium to coarse grain sizes dominant. It was completely unconsolidated, with angular to rounded, clear to milky quartz occasionally exhibiting minor quartz overgrowths. Relict feldspar crystals were recorded in trace amounts.

Abundant coal was penetrated between 1878 m and 2732 m, especially between 2150 m and 2350 m. The coals were of bituminous grade, black, glossy, hard and brittle with a conchoidal, blocky and lamellar fracture. Occasionally embedded in the coals were fine pyrite blebs and streaks, white calcite veinlets and microlaminations of fine grained sand. Locally, the coals became argillaceous and graded into lignitic shales.

Interbedded with the coals and sandstones were dark brown to black shales that were generally moderately soft to hard, fissile, non-calcareous and relatively brittle. They contained variable amounts of carbonaceous and coaly material, silt, sand, mica and pyrite, whilst many fragments exhibited microlaminations of sandstone and coal.

Between 2207 m and 2780 m, several thin stringers of reddish-brown, very hard and brittle, arenaceous, microcrystalline dolomite were penetrated. These occurred entirely within the Early Eocene and may prove to be marker beds for this part of the EVCM.

Palynological analyses suggest that the depositional environments for the interval 1898 m to 2801 m are dominantly marginal marine with occasional nearshore marine influences, especially within the Early Eocene Upper M. diversus. The Middle Eocene P. asperopolus zone is very coaly and was deposited in a non-marine lagoonal environment.

The next package of sediments from 2801 m to 3031 m ranged in age from Late to Early Paleocene, the boundary between the two being placed at 2885 m. The sequence consists of interbedded sandstones, shales and siltstones with minor thin coals and interbedded clayey sandstone and pyroclastics at the base. Two distinct types of shale were present, one lighter coloured and very silty with moderate amounts of organic material, the other darker coloured, less silty and very organic rich, occasionally grading lignite. The lighter shales often graded into siltstones which were very argillaceous, micaceous and contained abundant carbonaceous material as finely disseminated particles and wispy, coaly bands. Occasionally the siltstones contained abundant fine sand and graded to argillaceous sandstones.

The sandstones ranged fine to very coarse grained but were dominantly medium grained and well cemented with white and tan clays and contained relict feldspars, mica and abundant carbonaceous matter.

The coals were rare and typically thin and of lignitic to sub-bituminous grade, with abundant finely disseminated pyrite and bands of resinous material.

The pyroclastics were mottled light grey and white and very soft, consisting of mostly clays and relict feldspars in a flow banded texture.

Palynological determinations suggest that the depositional environment for the bulk of the section is non-marine lacustrine, based on the lack of dinoflagellates other than Morkallacysta.

A number of the zones within the EVCM of Yolla-1 were composed of igneous extrusives, with one thick zone of intrusive. The extrusives were recorded over the intervals 2413 m to 2422 m and 2567 m to 2580 m and consisted mostly of dark grey pumice and cream-white tuff. A porphyritic rock consisting of feldspar phenocrysts in a glassy to cryptocrystalline groundmass was observed in the upper zone. A dolerite/gabbro intrusive, dated as Late Oligocene to Early Miocene, was penetrated over the section 2584 m to 2651 m, and is probably related to the Miocene pyroclastics encountered from 1237 m to 1305 m within the Angahook Formation.

Basalt (3031 m to 3351 m)

A thick sequence of amygdaloidal basalt was encountered at the base of the EVCM through to total depth. The basalt varied relatively fresh to extremely altered throughout the sequence, commonly altering to a mixture of carbonates, chlorites, silica and zeolites. The basalt is commonly fractured and veined, a feature noted in Core No. 2 and on the electric logs. The pervasive alteration and fracturing may be due to prolonged exposure between flows.

K/Ar dating of a relatively fresh sample of basalt gave a minimum age of 54.1 Ma, the true age being probably Late Cretaceous to Early Paleocene.

The basalts seen in Yolla-1 appear very similar to those encountered in the lower part of Aroo-1.

CONCLUSIONS

The following conclusions and contributions to geology were obtained from the drilling of Yolla-1.

1. A complete section, from at least Middle Miocene to Early Paleocene is represented at Yolla-1. No late Cretaceous sediments were penetrated although basalt encountered over the interval 3031 m to 3347 m is probably of questionable Late Cretaceous age. A minor unconformity is suspected at 1440 m within the Angahook Formation.
2. A substantial section of igneous rocks was drilled in Yolla-1. Including the basalt mentioned above, a number of intervals of extrusive and intrusive igneous rocks were recorded, throughout the well. A thick intrusive of dolerite/gabbro was drilled within the EVCN over the interval 2584 m to 2651 m, and is probably of Late Oligocene to Early Miocene age. Pyroclastics of this age occur within the Angahook Formation.
3. Light oil, condensate and gas were produced at measurable flow rates in several sections of the EVCN. The most prospective hydrocarbon zones occur between 1810 m and 1846 m with an average porosity and water saturation of 26% and 51% respectively, and between 2718 m and 2995 m with an average porosity and water saturation of 19% and 30% respectively.

SAMPLE DESCRIPTIONS

for

YOLLA-1

195-240M

ASSORTED SHELL DEBRIS: WH TO LT GRY W/ OCC DK GRY FRAG, DOM BRYAZOA AND CORAL FRAG W/ ASSORT SHELL FRAG AND SPICULES, LARGE (2CM) FRAG WHICH DECREASE IN SIZE BELOW 220M TO .25-.5CM, FRAG ALMOST COMPLETELY DISSOLVE IN COLD 10 PER CENT HCL W/ VIOLENT REACTION, MATRIX HAS BEEN DISPERSED AND DOES NOT EXIST IN SAMPLE.

240-410M

ASSORTED SHELL AND FOSSIL DEBRIS: DOM CRM AND LT GRY W/ OCC WH AND M GRY. BRYAZOA, CORAL, PELECYPODS, FORAMS, ASSORT SHELL FRAG, SPICULES, OCC STROMATOLITE FRAG(?), 100% DIGESTION IN COLD 10% HCL. TR LT TO MED GRN PELLETAL GLAUC INFILLING FOSSIL CAVITIES. NO MATRIX MAT PRESENT IN SAMPLE.

CRM COLORED FRAG INCREASE W/ DEPTH.

410-440M

DOM BIOCALCIRUDITE: DOM CRM TO BUFF TO WH W/ SOME LT GRY. FOSS AND SHELL DEB OF VAR SIZES (DOM RUDITE BUT MOD AMOUNT OF BIOCALCARENITE). BRYAZOA, PELECYPODS, SPICULES, SHELL FRAG. OCC M TO DK GRY FORAMS. OCC DK GRN GLAUC PEL INFIL FOSS CAV. OCC F XTLN CLR TO WH CALC INFILING PORES AND CAV GRDNG TO WH-CRM MICROXTLN OVER GRWING FOSS BOUNDARIES. OCC PY REPLACEMENT OF MICROFOSS.

BIOCALCARENITE AS FRAG HELD TOGETHER BY WH MICROXTLN CMT.

440-535M

BIOCALCARENITE: LT CRM TO LT GRY, M TO C GR ASSORT FOSS DEB W CMT BY CRM-WH MICROXTLN CALC MIXED W/ MINOR AMOUNT OF LT TAN CLY (5% OF ROCK). DK GRY FORAMS AND DK GRN GLAUC PEL GIVE S + P APPEAR. FIRM BUT MOD FRI. VIS POR IS 5%. SL INC IN CLY BELOW 470M. (UP TO 15-20%)

BELOW 500M

APPEARANCE OF OCC GRS OF QTZ SILT. INCREASE IN MICRITIC MATRIX.

535-640M

CALCARENITE: CRM TO LT GRY, DOM M GR, MOD W SRT CALC DEB W/ SOME RECOGNIZABLE FOSS. MTX IS LT CRM TO TAN-WH MICROXTLN CALC GRDNG TO A CRYPTO CLASTIC FLOUR: MTX APPROX 20-30% OF RK AND CONTAINS APPROX 25% LT GRY CLY MAT. W CMT, MOD SFT AND MOD FRI. OCC LT GRN GLAUC PEL. OCC DK MIN, TR M GR CLR ANG QTZ SLT. VIS POR RANGES FROM LESS THAN 5% UP TO 20% (570M). REDDISH-TAN CALC XTLS BELOW 575M.

RECOGNIZABLE FOSS DECREASE BELOW 560M. F TO V C GR M GRN AND DK GRY TO BLK FORAMS BELOW 590M.

640-685M

CALCARENITE: WH TO LT CRM W/ OCC TAN AND LT GRY SPECLED W/ BLK MICROFOSS, OCC DK MIN AND LT TO DK GRN GLAUC. DOM M GR BUT VAR FROM F TO OCC C. MOD ABUN RECOGNIZ FOSS. FIRM TO MOD FRI, DOM W SRT. 75-85% GRAINS, 15-25% MTX: WH TO CRM MICRO TO CRYPTOXTLN CALC AND MINOR CLY.

685-720M

CALCARENITE GRDNG TO CALCILUTITE: LT GRY W/ ABUN BLK AND DK GRN SPECS (S+P APPEAR), DOM M GR W/ F TO C, MOD W SRT, FIRM TO MOD FRI. APPROX 60% GRAINS, 40% MTX GRDNG TO CALCILUTITE W/ ABUN SLT AND SAND SIZED CALC FRAG. GRAINS: ASSORT CALC FRAG AND FOSS DEB GEN CLR TO WH AND GRY W/ ABUN M GRN GLAUC PEL AND BLK FORAMS, FOS AND FECAL PEL(?). MTX: LT GRY MICRITIC OOZE AND LT GRY V HYDRATABLE CLY (CLY 5-30% OF MTX).

720-730M; 750-785M

CALCILUTITE: LT GRY, MICRO TO CRYPTOXTLN CALC W/ ABUN SILT SIZE CALC: CLR SUBHED XTLN TO NONDESCRIPT GRAINS AND FRAG, AND OCC CALCARENITE FRAG. VAR ABUN OF CLR AND BLK MICROFOS - DOM FORAMS - AND OCC DK GRN GLAUC PEL. VIOLENT REACTION IN 10% HCL LEAVING A HIGH CLAY RESIDUE (20-40%). VAR DOL (5-15%). V HYDRATABLE AS SAMPLE EXISTS PREDOM AS A CALC OOZE. TR V F TO F GR SAND AND SILT SIZE CLR SUBANG QTZ.

730-750M

CLYST: LT GRY CLAY OOZE W/ ABUN CALCILUTITE AND CALCISILTITE (30-40% CALC) AND TR DOL. OCC BLK AND CLR MICROFOS-DOM FORAMS - AND DK GRN GLAUC. EXTREMELY F SPECS OF MICA (?).

BLK MICROFOS INCREASE BELOW 735M.

785-1035M

CLYST: LT GRY W/ FNT GRNISH HUE EXISTS DOM AS AN OOZE W/ OCC V SFT HYDRATABLE FRAG. 30-40% CALCITIC DOM AS MICROXTLN BUT VAR AMTS OF FINELY XTLN, FOS FRAG AND MICRO FOS-DOM FORAMS. CALC CONTENT DECREASES W/ DEPTH TO 15% AT 880M. OCC TR DOLOMITIC. EXTREM F BLK SPECS THROUGHOUT. OCC MICA FLAKES AND TR TO 5% CLR M TO C GR RND TO ANG QTZ SLT. TR CLR F GR SUBANG QTZ SAND. CLYST BECOMES SLIGHTLY MORE CONSOL BELOW 945M. M TO DK GRN CLAUC PEL INTERSPERSED THROUGHOUT ALONG W/ OCC PY.

LT RD-BRN MICA FLAKES BETWEEN 825-30M.

ABUN QTZ SLT AND V F TO F GR CLR SUBANG QTZ SAND BETWEEN 800-10M, 830-35M, 870-75M, 920-25M.

TR AMOUNTS OF QTZ SLT THROUGHOUT FROM 800-990M WHERE IT INCR TO 5% TO 1025M.

OCC LSE GRS OF F TO OCC M GR CLR QTZ SAND THROUGHOUT BELOW 800M.

1035-1095M

CLYST: (BETTER CONSOL W/ DISTINCT RK FRAG IN LARGE MESH DISH): M GRY (AS RK) TO LT GRY AS OOZE, V SFT W/ NO DISTINCT BRKAGE CHARACTER, WAXY, SL CALC (5-10%), MICROSUCROSIC TEX ON FRESH BRK SURF GIVING A SILKY SHEEN, MOD ABUN MICROFOS AND FOS FRAG W/ OCC BLEBS OF F XTLN EUHED CLR CALC, OCC BLEBS AND STREAKS OF PY, OCC MICA AND F CARB MAT(?).

1095-1180M

CLYST: DOM AS OOZE, LT GRY W/ MOD ABUN WH TO TAN FOS FRAG AND CALC DEBRIS. APPROX 10% MICROXTLN CALC AND 5% M TO C GR RND TO ANG QTZ SLT. OCC MICA AND EXTREM F BLK SPECS. RK: MED GRY, SFT AND WAXY BUT SL BEGIN OF FIS, MOD CALC (5-10%) MOD SLTY, OCC MICA, PY BLEBS AND XTLS, FORAMS AND BLEBS OF WH TO CLR F XTLN CALC. CLYST BECOMES DKER BELOW 1145M W/ FIS DEVELOPING - TRANSITIONAL TO SHALE.

OCC RD-BRN V HD SIL DOL FRAG BETWEEN 1115-20M.

1180-1240M

CLYST/SHALE: LT TO M GRY, SFT, MOD FIS W/ PREFERENCE FOR PLANAR BRKAGE, EASILY SCRATCHED, GRITTY TEX FROM ABUN M TO C GR CLR SUBANG QTZ SLT (UP TO 15%) AND OCC F TO M GR CLR QTZ SAND GIVING SOME SURFACES A SUCROSIC APPEAR. 5-10% CALC W/ OCC FOS FRAG AND BLEBS OF MICROXTLN SUBHED CALC. PY XTLS AND BLEBS, MICA, F BLK SPECS AND OCC CARB MAT. V DRLG DISP W/ MUCH OF SAMPLE REMAINING AS CLAY OOZE. ROCK TYPE IS TRANSITIONAL BETWEEN CLYST AND SHALE. OCC FRAG DKER, MOD HD AND INDURATED.

1240-1325M

CLYST: LT GRN-GRY, GRY-TAN, LT TAN-BRN, M GRY AND OCC RD-BRN. SFT TO FIRM AND GEN V DRLG DISP. TR TO 10% CALC W/ VAR AMT OF FOS FRAG AND MICROFOS-DOM FORAMS. MOD SLTY THROUGHOUT W/ F TO C GR CLR RND TO ANG QTZ SLT AND OCC V F TO M GR CLR SUBANG QTZ SAND. OCC PY, MICA AND M GRN GLAUC PEL.

VOLC: WH, LT BLUISH-GRY TO OCC BLK (1270M), MOTTLED, W WEATHERED PYROCLASTICS (?) PREDOM ALTERED TO CLYS. SFT TO FIRM W/ NO DISTINCT XTLS IN GROUNDMASS. (SFT GRY METALLIC FRAGS AT 1305M.) SL CALC, VAR SLTY AND SNDY, VAR AMT PY.

SST BEGINNING BELOW 1260M: LT TAN-BRN TO GRY, F TO V C GR, RND TO ANG, V PR SRT, MOD HD TO HD, MOD FRI, W CMT W/ CLY, SIL AND CALC. OCC LITHIC GRS, DK MAFIC GRS AND FRAG, PY NODULES AND CHERT PEB FRAG. EFF VIS POR LESS THAN 5%. LOCALISED OIL STN AND CARB MAT W/ EARTHY TEX. TR M YEL FLUOR. FNT V PL YEL CRUSH CUT FLUOR. 1275 AND 1280M: MOD BRIGHT YEL FLUOR W/ PL STRW CRUSH CUT AND MOD BRIGHT BL-YEL CRUSH CUT FLUOR W/ BR BL-YEL DES RNG. DOES NOT STREAM UNTIL CRUSHED.

1300-05M SST V SIL AND HD.

SLTST (BELOW 1310M): TAN TO BRN TO OCC DK BRN-GRY, F GR, SUBRND-SUBANG QTZ SLT IN A TAN CLY MTX (20-40%), CALC, MOD HD TO OCC V HD, OCC SNDY.

1325-1385M

SST: LT BRN TO M BRN-GRY, V F GR OCC GRDNG TO SLT, SUBRND TO SUBANG, W SRT, CLR QTZ. MOD SFT TO V HD, CALC (UP TO 15%), SLTY (UP TO 40%) AND CLYEY (UP TO 15%). OCC TO ABUN PY BLEBS AND FREE NODULES, BLK CARB MAT, DK MIN GRS, GRN GLAUC PEL AND OCC MICROFOS. NO EFF POR. 1350M, 1360, 1365M: TR PINPOINT MOD BRT YEL FLUOR W/ V SLOW V PL BL-WH STRMG CUT LEAVING A V PL BL-WH DES RNG. OCC "BLEBS" OF BLK BITUMEN.

1340-45M THE SST CONTAINS ABUN SLT MATERIAL.

CLYST: M BRN-GRY, MOD SFT, V CALC (25%) AND SLTY (20%). MAS W/ FNT FIS, CARB MAT, OCC PY.

1365-1385M

SST: LT BRN, M GRY-BRN W/ OCC LT GRY-WH. V F TO F GR, SUBRND, MOD W SRT CLR QTZ. MOD SFT TO V HD, V CALC (UP TO 30%), SLTY (UP TO 20%) AND CLYEY (UP TO 25%). ABUN PY AND GLAUC, CARB MAT AND OCC CHLORITE(?). NO EFFEC POR. 1370M, 1375M: TR PINPOINT YEL FLUOR W/ V PL V SLOW YEL STRMG CUT FLUOR W/ PL YEL-WH DES RNG.

CLYST: BRN, GRN GRY W/ OCC GRN-WH MOTTLED VOLC. MOD SFT, V CALC (25%), SLTY (20%). OCC PY AND CARB MAT.

1385-1450M

SST: LT BRN, LT GRY-TAN, BUFF-WH, V F TO F GR, OCC M GR BELOW 1410M. SUBRND TO SUBANG, W TO MOD W SRT, MOD SFT TO HD. W CMT W/ CALC (15-25%), OCC SL DOL - RD-TAN, AND OCC GRY CLY. MOD TO ABUN GLAUC PEL, PY AND CARB MAT. OCC XTLN CALC AND CALC VEINLETS XCUTTING THROUGH FRAG. OCC MICA. FOS FRAG (ESP BELOW 1440M W/ DULL GOLD-YEL MIN FLUOR. NO EFF POR. 1400M, 1405M: TR PINPOINT MOD BRT YEL FLUOR, V PL BL-WH CRUSH CUT FLUOR W/ V FNT BL-WH DES RNG FLUOR. 1430M: TR MOD BRT YEL FLUOR, PL STRAW CRUSH CUT, SLOW STRMG BRT YEL-WH CUT FLUOR, V BRT YEL-WH CRUSH CUT FLUOR, V BRT BL-WH DES RNG FLUOR.

CLYST: M GRY-BRN, BRN AND OCC MOTTLED GRN-WH (VOLC) AND GRY. SFT, WAXY, V CALC (UP TO 30%), VAR SLTY AND SNDY (UP TO 20%), MOD ABUN PY, GLAUC AND BLK CARB MAT.

5% RD-TAN, HD, SNDY DOL W/ EMBEDDED M GRN GLAUC PEL BETWEEN 1440-45M.

1450-1485M

CLYST: LT GRY, LT BRN-GRY, LT OL-GRY, M TO DK GRY, NON TO V CALC (UP TO 20%), TR DOL, TR V F GR QTZ, TR MICA, PY, GLAUC AND MICROCARB, V SFT AND HYDRATABLE.

SST: V PL ORNG, YEL-GRY, OCC LT BRN-GRY, V F TO F GR, SUBANG TO SUBRND, MOD W SRT, FRI TO FIRM, 20-30% CALC CMT, TR PY, TR CARB AND GLAUC, V POOR VIS POR. MINOR DULL YEL-WH MINERAL FLUOR.

1485-1505M

CLYST: LT GRY TO LT BRN W/ ABUN OL-BRN, VAR CALC TO DOL, VAR HYDRATABLE, V SFT, TR V F SDY, TR MICA, MICROCARB, RARE GLAUC.

SST: V PL ORNG TO ORNG-PNK, V F GR, SUBANG TO ANG, MOD SRT, FRSTED, BRN AND CLR QTZ IN LT REDDISH-BRN CALC TO DOL MTX, ABUN GRDNG TO SNDY DOL EQUIV, VIS POR 10%, CRUSH CUT CLR W/ PL YEL FLUOR.

1505-1570M

CLYST: LT TAN, LT TO M BRN, GRY-BRN TO M GRY, ALL EXTR SFT AND HYDRATABLE, DOM NONCALC W/ LT GRY HIGHLY CALC, GD TR V F SNDY, TR V F MICROPY AND RARE PY VEINLETS, GD TR FREE FORAMS.

SST: DOM UNCONSOL REDDISH-BRN AND FRSTED QTZ, V F GR, ANG, PRLY TO W SRT, FRI, TR TO MOD CALC TO DOL. LESS THAN 10% VIS POR. CRUSH CUTS CLR W/ PL YEL FLUOR.

SNDY DOL: LT TO M W/ ABUN DK REDDISH-BRN, V F MICROXTLN TO MINOR MICRITIC, EXTR HD, DNSE AND BRTL, CLASTIC W/ RARE RELIC FORAMS AND ABUN TO APPROX 40% SNDY, OCC GRDNG TO DOL SST, VAR SIL TO V MINOR HIGHLY CALC, RARE MICROPY, NO VIS POR.

TUFF: LT GRY-GRN TO GRY-TAN, MOD HD, HIGHLY FRI, TR CALC, V SNDY, GD TR PY, GLAUC (?), GD TR YEL-TAN PALAGONITE (?). SLOUGH (?).

ABUN PY AGGS BETWEEN 1530-45M, 1555-60M.

1570-85M

CLYST: AS IN 1505-70M BUT GREATER ABUN OF GRY, TR DOL, TR MICROCARB AND MICA.

SNDY DOL: AS IN 1505-70M BUT GREATER ABUN OF DK RD-BRN TO "CHOC" BRN AND DOL SST W/ UP TO 10% VIS POR.

SST: AS IN 1505-70M W/ OCC M GR, V CALC TO DOL MTX, TR GLAUC AND MICROCARB. LESS THAN 10% VIS POR.

1585-1615M

SST: WH TO CRM-WH AND GRY-WH W/ SOME REDDISH-WH BELOW 1609M, V F TO OCC F GR, ANG, MOD SRT, EXTR SFT AND FRI, TR TO MOD CALC TO TR DOL, TR M GRN GLAUC, TR MICROPY. 10% VIS POR.

CLYST: LT TAN, LT TO M GRY, LT TO M BRN TO M DK RD-BRN, V SFT AND HYDRATABLE, TR TO MOD CALC TO DOL, ABUN SLTY AND SNDY AND SL HARDER BELOW 1609M, TR TO ABUN MICROPY, PY, AND PYRITIZED FORAMS AND CRINOIDS, MICA, BLK MICROCARB, M GRN GLAUC.

1590-95M V ABUN FORAMS.

1615-1735M

CLYST: DOM LT TO M TAN, GRY-TAN AND GRNSH GRY-TAN W/ APPROX 5% DK REDDISH-BRN TO 1640M, DK REDDISH-BRN INCREASING TO 40% BY 1690M AND 60-100% TO 1735M. MOD HD, BLKY TO PRLY FIS W/ RARE HIGHLY FIS, HIGHLY HYDRATABLE, TR TO DOM MOD CALC (CALC TO MINOR DOL), VAR V F TO C SLTY TO V F GR SNDY, VAR PY W/ GD TO ABUN MICROPY AGG AND PY FORAMS, CRINOIDS, ABUN NON-PY FORAMS, TR TO ABUN MICA (MUSC/BI), TR TO ABUN DISSEM BLK MICROCARB, RARE PY MICRO-VEINLETS.

SST: DOM LT TO M REDDISH-BRN W/ TR WH, V F TO F GR, DOM ANG TO TR RND (F GR), W TO PR SRT, EXTR SFT AND FRI, DOM FRSTED W/ABUN CLR TO BRNSH QTZ, MTX DOM LT REDDISH-TAN, CALC TO DOL AND CLYEY, TR M GRN GLAUC, VIS POR 10-20%.

DOL LMST: LT TO M W/ RARE DK REDDISH-TAN TO REDDISH-BRN AND RARE LT YEL-TAN, DOM EXTR HD, DNSE AND BRTL W/ TR TO ABUN MOD HD, FRI AS V F DOLARENITE EQUIV, DOM MICRITIC W/ MINOR V F TO F MICROXTLN, TR TO V/ABUN SLTY TO SNDY, VIS POR ABSENT - LESS THAN 10% IN DOLARENITE.

1735-1814M

CLYST: SHALY, SNDY AND SLTY, DK REDDISH-BRN, MOD HD, NON-FIS TO POORLY FIS W/ TR MOD FIS, VAR SLTY AND SNDY W/INCR IN ARENACEOUS CONTENT AFTER 1736M AND OCC GRDNG TO CLYEY, SNDY SLTST BELOW 1759M, MOD TO HIGHLY HYDRATABLE TO PRLY HYDRATABLE BELOW 1759M, CALC TO MINOR DOL BECOMING NONCALC BELOW 1781M, RARE TO ABUN V F MICROPY AGG AND PY FORAMS AND CRINOIDS W/ ABUN NON-PY FORAMS, TR TO ABUN MICA (MUSC/BI), TR TO V ABUN DISSEM BLK MICROCARB, RARE PY MICRO-VEINLETS.

DOL LMST: LT TO M REDDISH-BRN, EXTR HD, DNSE AND BRTL W/ ABUN CONCH FRAC, DOM MICRITIC W/ MINOR V F TO M MICROXTLN, CLASTIC W/ TR TO EXTR ABUN SLT-GRADE TO V F DOM BRN, SHARP TO ANG QTZ, VIS POR ABSENT.

SST: LT TO DK REDDISH-BRN, V F GR, ANG, MOD PR TO MOD W SRT, V SFT AND FRI, CLR, FRSTED AND BRNSH QTZ W/ RARE M GRN GLAUC AND V F MICROPY IN A LT REDDISH-TAN CLYEY TO TR CALC MTX. TR DOL, TR BLK MAFICS 10-20% VIS POR.

1814-1831M

SST: LT TO DK REDDISH-BRN, V F GR, ANG, PR SRT, V SFT AND HIGHLY FRI, EXTR CLYEY W/ VIS POR 10-20%, GD TR PY, MICA, CRUSH CUT TR FROM 1825-1831M.

CLYST: M TAN TO RARE YEL-TAN TO REDDISH-BRN, MOD HD, SLTY AND SNDY, MOD CALC TO TR DOL.

DOL LMST: DK REDDISH-BRN, EXTR HD, DNSE AND BRTL, MICRITIC, SLTY AND SNDY.

1831-1838M

SST: LT TAN, V F GR, ANG, MOD W SRT, EXTR SFT AND FRI, FRSTED QTZ W/ A MINOR LT TAN NON CALC CLY MTX, ABUN LT TO M GRN GLAUC. 20-30% VIS POR. EVEN LT BRN OIL STAIN OF LT YEL TO BRT CANARY YEL FLUOR, CRUSH CUTS CLR W/ EXTR BRT, INTENSE, TRANSP LT CANARY YEL FLUOR LEAVING A V LT BRN DES RNG OF BRT CANARY YEL FLUOR.

1838-1848M

CORE NO.1 CUT 10M REC 2.8M.

SST: LT TAN TO LT BRN, V F GR, MOD PR SRT, ANG, FRSTED QTZ W/ TR M GRN GLAUC (?), MTX LT BRN, NON CALC CLY SPARSE, MOD HD AND TOTALLY FRI W/ ONE EXTR HD, DNSE AND BRTL, SIL, DOL, V F GR SST INTERVAL OF APPROX 0.3M AT 1843M. 25-30% VIS POR. EVEN LT BRN OIL STAIN OF EVEN M GOLDEN YEL FLUOR AND V LT BRN CRUSH CUT OF V BRT, MOD INTENSE, HIGHLY TRANSP, V LT YEL FLUOR LEAVING A LT BRN, BRT, LT CANARY YEL DES RNG, MOD PETROLEUM ODOR FROM FRESH SURFACES.

1848-1898M

SST: CONTINUED AS IN CORE #1 W/ APPEARANCE AND MARKED INCREASE OF V F MICROPY, GLAUC, MICA AND RELICT FELD AS LT CLYS BELOW 1850M. ABUN F TO M AND OCC C GR LOOSE SAND BELOW 1859M. SHOWS CONTINUE AS IN CORE #1 UNTIL 1856M. BELOW THIS THERE IS NO NATURAL FLUOR AND INCREASINGLY PALER CUT AND CRUSH CUT FLUOR.

CLYST: M TO DK "CHOC" BRN, MOD HD, SUBFIS AND BLKY, NON CALC TO TR DOL, SLTY, SNDY, MICROCARB, MICA, PY. ABUN V THIN (0.5-20MM) SST LAM.

COAL: BIT, BLK W/ MINOR BRNSH-BLK, V HD, DNSE, BRIT, DOM CONCH FRAC W/ MINOR CUBIC FRAC, PY. CRUSH CUTS CLR W/ V PL TRANSP YEL FLUOR.

1898-1982M

SST: UNCONSOL, CLR TO FRSTED AND BRNSH QTZ, V F TO V C GR, ANG TO RND, V PR SRT, OCC FELD AND FELD RELICTS AS LT COLORED CLY. THIS SST TYPE DECREASES W/ DEPTH. V LT BRN OIL STN AND PATCHY DK BRN PYROBIT, CLR CUT AND CRUSH CUT W/ BRT, INTENSE TRANSP CUT AND CRUSH CUT FLUOR, AND A CLR, LT GOLDEN-YEL DES RNG FLUOR.

SST: LT TAN TO WH, V F GR, ANG, MOD PR SRT, MOD SFT AND V FRI, MOD ABUN WH TO TAN NON CALC KAOL MTX, VAR AMNTS OF BLK CARB MAT AS THIN WISPS AND DISSEM PARTICLES, PY, MICA AND GLAUC(?), OCC TR RD-BRN GARNET(?). 10-20% VIS POR. SPOTTY LT BRN OIL STN, CLR CRUSH CUT W/MOD BRT M YEL FLUOR AND A CLR, MOD BRT GOLD-YEL DES RNG FLUOR.

COAL: BLK TO OCC DK BRN, V HD, DNSE, BRIT, CONCH AND CUBIC FRAC, OCC PY. V PL STRW CRUSH CUT W/ A V BRT MOD INTENSE M YEL FLUOR AND TR LT BRN BRT M YEL FLUOR DES RNG.

CLYST: M BRN, MOD HD AND NON FIS TO PRLY FIS, VAR SLTY, SNDY AND MICMICA. CLR CRUSH CUT W/ MOD BRT, MOD INTENSE M TO LT YEL FLUOR W/ A CLR, BRT YEL FLUOR DES RNG.

DOL: LT TO M TAN, EXTR HD DNSE, BRIT, MICRITIC, VAR SLTY AND SNDY OCC GRD TO A DOL SST.

V ABUN FREE MICA BETWEEN 1910-13M, 1928-31M, 1967-76M.

1982-2018M

SST: CLR TO WH QTZ, V C TO M GR, SUBRND TO SUBANG, V PR SRT, COMPLETELY UNCONSOL, OCC INTERLOCK CRM TO TAN ALTERED FELD, OCC WH INTERST CLY. GR SIZE DECREASES W/ DEPTH. 30% VIS POR. QUESTIONABLE TR FNT PL BL-WH DES RNG FLUOR. SST (BEGINS BELOW 1994M): WH TO CRM TO OCC TAN, V F TO F GR, SUBRND, W SRT, MOD HD, W CMT W/ LT COLOR CLY. THIS SAND IS V FNLY BD W/ DKER STRKS OF CARB, ARG BANDS (1MM). 10% VIS POR. OCC GR W/ LT BRN OIL STN GIVING A LT STRW CUT, FST STRMG V BRT AND INTENSE YEL-WH FLUOR W/ A M ORNG FLUOR DES RNG.

COAL: BLK, HD, BRIT, CONCH FRAC, OCC PY BLEBS, BLKY. GRDS TO V ORG RICH DK RD-BRN EARTHY SHALE.

V F MICROBDNG OF SST W/ ARG AND CARB MAT NOTED ESPECIALLY BETWEEN 1997-2000M.

2018-2060M

SST: CRM TO OCC TAN, V F TO F GR, SUBRND, W SRT, W CMT W/ CLY, MOD SFT, V F BDS OF ORG MAT W/ ABUN MICA, MOD ABUN DK RD-BRN SFT ORG MAT, OCC SL DOL, OCC FELD, VIS POR 10%.

SST: WH DOM M GR BUT F TO C, SUBANG-SUBRND, MOD PR SRT, CLR TO MLKY QTZ, FRI, INTERLOCK RELICT OF WH-TAN FELD, WH CLY MTX, OCC CARB MAT. VIS POR 20%.

SHALE: M TO DK GRY-BRN GRDNG TO BLK, MOD SFT, SUBFIS, NON CALC, EARTHY AND ORG RICH GRDNG TO LOW GRD COAL. VAR SLTY AND SNDY, MICA, DISSEM PY AND BLEBS, OCC BD W/ F GR SST.

SLTST: M RD-TAN, V ARG, HD, V W IND, SL DOL, BRIT, OCC SNDY.

COAL: V THIN STRNGRS, BLK, BRIT, CONCH FRAC, GRDS TO V ORG RICH SHALES IN PART. TR PINPOINT DEAD OIL STAIN (?) PYROBIT (?) ON OCC SST FRAG AND ON LARGER GR FACES THROUGHOUT INTERVAL. M YEL TO GOLD FLUOR, PL TRANSP BL-WH CUT FLUOR W/ A DULL YEL TO ORNG DES RNG FLUOR.

2060-2176M

SST: M TO V C GR, CLR TO MLKY W/ OCC ROSE, UNCONSOL QTZ, SUBRND-SUBANG GR AND SUB AND EUHED XTLS. OCC FRAG W/ INTERLOCK RELICT CRM-PNK FELD AND WH CLY, QTZ OVRGRWTHS. OCC GRS FRSTED AND PITTED. UP TO 30% VIS POR. MOD ABUN M TO DK BRN OIL STN(?) PYROBIT(?).

M TO V C GR LSE SND MOST ABUN BETWEEN 2072-85M, 2102-07M, 2111-17M, 2133-40M.

SST: WH TO CRM-TAN, V F TO F GR, SUBRND W/ OCC SUBANG, W SRT, W CMT W/ WH CLY, MOD FIRM BUT EASILY FRI, OCC GRDS TO SLTST, ABUN THIN BANDS OF GRY-BRN ORG MAT, ABUN CLR MICA, OCC PY. POR GEN 10% OR LESS BUT OCC UP TO 20% IN CLEANER FRAG. OCC M TO DK BRN OIL STN ASSOC W/ ORG MAT.

V F TO F GR W CMT SST MOST ABUN BETWEEN 2087-90M, 2093-2102M, 2115-29M, 2135-43M, 2166-68M.

COAL: BIT TO SUBBIT, BLK, HD, BRIT, CONCH FRAC AND BLKY, STRIATED, OCC BECOMES V ARG, ABUN ASSOC PY, DK MICA AND V THIN F GR SST.

SHALE: DK GRY-BRN, OCC M GRY-BRN AND BRN-BLK, MOD SFT, SUB FIS, V ORG RICH OCC GRDNG TO ARG COAL. V THINLY INTERBD F GR SST, VAR SLTY AND SNDY OCC GRDNG TO V ARG SST, NON CALC, ABUN MICA (MUSC/BI), F DISSEM PY. DKER SH HDER AND HIGHLY INDURATED.

ORGANIC MAT AND ASSOC OIL STN GIVE PL TRANSP BL-WH CUT FLUOR W/ A DULL M YEL DES RNG FLUOR THROUGHOUT SECTION.

2123-2147M

GOOD M TO DK BRN OIL STN, MOD BRT YEL FLUOR, LT STRAW CUT W/ A MOD BRT TRANSP YEL-WH STRMG CUT FLUOR, BRT BL-WH DES RNG FLUOR.

BED THICKNESS HIGHLY VARIABLE IN THIS SECTION FROM 1MM LAMINATIONS TO GREATER THAN 5M.

2176-2212M

SST: TAN TO LT BRN, V F GR, ANG, MOD W TO MOD PR SRT, MOD SFT AND FRI, CLR AND FRSTED QTZ AND OCC FELD IN A NONCALC CLY MTX, ABUN BLK MICROCARB WISPS AND CLYST LAM, TR MICA AND PY. 10-20% VIS POR. LT BRN, EVEN TO V MINOR SPOTTY, RESID OIL STN, DULL YEL-BRN FLUOR OF CLR CRUSH CUT W/ M LT YEL FLUOR AND CLR DES RNG OF BRT YEL FLUOR.

SHALE: DK BRN TO BRNSH-BLK W/ MINOR M BRN, MOD HD AND MOD TO HIGHLY FIS W/ GD TR BLKY, ABUN MICA HIGHLY MICROCARB, RARE TO GD TR V F TO C SLTY TO V F SNDY, GD TR V F SST AND COAL MICROBEDS, NON-CALC. CRUSH CUTS CLR W/ MOD BRT, MOD INTENSE, M YEL FLUOR LEAVING A NUANCE OF LT BRN DES RNG OF V BRT CANARY YEL FLUOR.

SLIST: V MINOR AS LT TO DK BRN, MOD SFT, MOD CLYEY TO V F SNDY, DOM ABUN MICROCARB, GD TR TO ABUN MICA, RARE PY, NON-CALC, CRUSH CUTS CLR W/ LT YEL FLUOR AND CLR DES RNG OF MOD BRT, LT YEL FLUOR.

COAL: BIT, DOM BLK W/ OCC V DK BRN, MOD HD, DNSE, V BRIT, CONCH AND LAMELLAR FRAC, HIGH LSTR, TR PY. CRUSH CUTS CLR W/ EXTR BRT AND INTENSE, PRLY TRANSP, M YEL FLUOR LEAVING A NUANCE OF LT BRN DES RNG OF EXTR BRT CANARY YEL FLUOR.

RD-TAN, V HD, MICROXTLN DOL BETWEEN 2204-07M.

2212-2355M

SHALE; VAR M TO DK BRN, OFTEN AS "VARVE-TYPE" INTEREDS IN V F SST, MOD HD, PRLY TO HIGHLY FIS, ESP AS INTERBEDDED (VARVE-TYPE) W/ BIT COAL. NONCALC, DOM EXTR CLYEY W/ GD TR TO ABUN SLTY AND SNDY, EXTR ABUN TO GD TR DISSEM TO LAYERED BLK TO BRNSH-BLK MICROCARB, GD TR TO ABUN MICA (MUSC), RARE V F MICROPY. CLR CRUSH CUTS OF MOD BRT AND INTENSE, HIGHLY TRANSP M LT TO LT GOLDEN YEL FLUOR LEAVING EXTR LT BRN DES RNG OF V BRT GOLDEN YEL FLUOR.

SST: LT TAN TO LT BRN W/ ABUN LT TO DK CRMY-TAN, V F TO F GR, ANG, MOD W TO MOD PRLY SORT, FRI, FRSTED TO MINOR CLR QTZ W/ MINOR FELD AND ABUN TO RARE MICA (MUSC), TAN CLY MTX, TR DISSEM V F MICROPY, RARE MAFICS, ABUN FRAGS W/ VARVE-TYPE SH AND BIT INTERBEDS, NONCALC. VIS POR 10-30%, EVEN TO SPOTTY EXTR LT BRN RESID OIL STN OF DULL YEL-BRN FLUOR W/ CLR CRUSH CUTS OF MOD BRT AND INTENSE, HIGHLY TRANSP, LT YEL FLUOR LEAVING A NUANCE OF LT BRN DES RNG OF LT GOLDEN-YEL FLUOR.

COAL: BIT, BLK W/ HIGH, GLOSSY TO RARE SUB-METALLIC LSTR, MOD HD, V DNSE AND BRTL W/ DOM CONCH AND MINOR LAMELLAR FRAC, RARE PY "STREAKS". CLR CRUSH CUTS W/ EXTR BRT AND INTENSE, MOD TRANSP, M GOLDEN-YEL FLUOR LEAVING AN EXTR LT BRN DES RNG OF EXTR BRT GOLDEN YEL FLUOR.

SLTST: V MINOR AS LT TO DK BRN, MOD SFT, DOM V CLYEY TO MINOR V F SNDY, GD TR TO EXTR ABUN BLK MICROCARB, RARE TO V ABUN MICA (MUSC), RARE TO TR V F MICROPY, NONCALC. CRUSH CUTS CLR W/ V LT YEL FLUOR AND CLR DES RNG OF MOD BRT, LT YEL FLUOR.

LMST: MOTTLED LT TAN TO M BRN, V F MICROXTLN, MOD TO EXTR HD, DNSE AND BRTL, RARE SLTY. VIS POR TO 10% - INTERGRAN. MOD BRT GOLDEN - YEL MIN FLUOR W/ CLR CRUSH CUT OF MOD BRT AND INTENSE, HIGHLY TRANSP, CANARY YEL FLUOR LEAVING A CLR DES RNG OF V BRT, LT CANARY YEL FLUOR.

LT TO DK RD-BRN, V HD, DNSE AND BRIT MICROXTLN DOL BETWEEN 2261-64M.

2355-2413M

SHALE: DK BRN TO BRNSH-BLK, MOD HD AND DOM MOD FIS, OCC SPLINTERY, NONCALC, V CLYEY AND PRLY TO EXTR MICROCARB W/ ABUN LT TAN V F VARVE-TYPE MICROBEDS AND RARE V F COAL FRAGS, DOM CLYEY W/ ABUN C SLT AND V F SND. CRUSH CUTS CLR W/ MOD BRT AND INTENSE, HIGHLY TRANSP LT YEL FLUOR LEAVING A CLR DES RNG OF BRT LT YEL FLUOR.

SST: LT TAN, V F GR, ANG, MOD W TO MOD PR SRT, MOD HD BUT FRI, LT BRN NONCALC TO TR CALC CLY MTX, GD TR BLK MICROCARB AND MICA, TR PY AND MAFICS(?). 10-20% VIS POR. ABUN EVEN V LT BRN RESID OF OIL OF MOD BRT GOLDEN YEL FLUOR W/ CLR CRUSH CUT OF DULL, LT YEL FLUOR LEAVING A CLR DES RNG OF LT YEL FLUOR.

DOL: LT TO DK REDDISH-BRN TO TAN, EXTR HD, DNSE AND BRTL, BLKY FRAC, MICRITIC TO MICROXTLN, RARE TO ABUN V F TO C SLT, RARE DISSEM MICROCARB, V RARE V F MICROPY. NO VIS POR, MIN FLUOR DULL YEL-BRN. CRUSH CUTS CLR W/ LT, MOD BRT YEL FLUOR LEAVING A CLR DES RNG OF LT YEL FLUOR.

COAL: BIT AND SUBBIT, BLK TO BRNSH-BLK, MOD HD, V BRIT, GLOSSY TO SUBMETALLIC AND RESINOUS LSTR, CONCH, LAMELLAR AND BLKY FRAC, TR PY. CRUSH CUTS CLR W/ V BRT AND INTENSE, MOD TRANSP, M GOLDEN-YEL FLUOR LEAVING A CLR DES RNG OF BRT CANARY-YEL FLUOR.

LMST (BELOW 2399M): LT TO M BRN AND TAN, MOTTLED, EXTR HD, DNSE AND BRTL, V F MICROXTLN, RARE TO GD TR V F SNDY AND V F TO C SLTY, RARE V F DISSEM BLK MICROCARB AND V F MICROPY. 0-10% FRAC AND INTERGRAN VIS POR. MIN FLUOR BRT GOLDEN YEL, CRUSH CUTS CLR W/ MOD BRT AND INTENSE LT YEL FLUOR LEAVING A CLR DES RNG OF BRT GOLDEN YEL FLUOR.

SECTION CHARACTERIZED BY ABUN V THIN "VARVE-TYPE" MICROBEDDING ESP BETWEEN SST AND CARB SHALE.

PUMICE: DK "STEEL" GRY, EXTR VESICULAR W/ VIT-METALLIC LSTR, ABUN ELONG VES, TR FILLED W/ WH CALC AND TR ELONG CAPILLARY TUBES, RARE PERLITIC CRACKS, CALC MIN FLUOR V BRT YEL.

2413-2423M

IGNEOUS: MOSAIC OF CRM, WH, CLR, GRY, TAN, BRN, RD-BRN, GRN AND BLK, GLASSY TO CRYPTOXTLN GROUNDMASS OF DOM FELD AND QTZ(?) ENCLOSING PHENOCRYSTS OF TABULAR PLAG, ABUN LT TO M GRN PYROX, DK GRN AMPHIB, RD-BRN BIOTITE, OCC NEEDLES OF APATITE. PLAG HIGHLY ALTERED TO CLYS, CALC AND CHLORITE.

TUFF: CRMY-WH, EXTR HD, DNSE AND BRTL AS A "WELDED" TUFF, V ASHY TEX W/ WELDED MODIFICATION, NONCALC.

2423-2439M

SST: LT TAN, V F TO M GR, ANG, MOD W TO MOD PR SRT, MOD HD BUT EASILY FRI, FRSTED CLR QTZ AND FELD, NON TO TR CALC AND DOL, OCC V THIN LAM OF MICROCARB SHALE. 20% VIS POR. V LT BRN, EVEN OIL STAIN OF MOD DULL YEL-BRN FLUOR, CRUSH CUT CLR W/ LT YEL FLUOR LEAVING A CLR DES RNG OF LT YEL FLUOR.

SHALE: DOM DK "CHOC" BRN W/ABUN DULL GRY-BLK AND TR M TAN, EXTR HD, HIGHLY SIL, HIGHLY FIS, NONCALC, RARE V F SLTY. CRUSH CUTS CLR W/ V LT YEL FLUOR LEAVING A CLR DES RNG OF LT YEL FLUOR.

DOL: DK REDDISH-BRN, EXTR HD, DNSE AND BRTL, MICRITIC, SIL, NO VIS POR.

2439-2563M

SST: LT TAN TO TAN-WH, V F GR, ANG, MOD PR SRT, MOD SFT AND V FRI, FRSTED TO CLR, BRN AND GRY QTZ AND MINOR FELD, LT TAN TO M BRN NONCALC TO TR DOL CLY MTX, ABUN MICROCARB AND CLY LAM, TR DISSEM MICROCARB. 10-20% VIS POR. CLR CRUSH CUT W/ EXTR BRT, MOD INTENSE, TRANSP, LT YEL FLUOR W/ A CLR DES RNG OF BRT, LT YEL FLUOR.

SST: TAN-WH, V F TO F W/ TR M GR, ANG TO RND, MOD PR SRT, V SFT AND FRI, DOM CLR FRSTED QTZ W/ TR PL GRN CHLORITE(?) AND FELD GRS IN A LT TAN NONCALC TO TR DOL MTX, TR MICROCARB AND MICA. 20-30% VIS POR. LT YEL TO YEL-BRN FLUOR W/CLR CRUSH CUT OF V BRT, INTENSE, MOD TRANSP LT YEL FLUOR AND A CLR DES RNG OF BRT, LT YEL FLUOR.

SHALE: M TO V DK BRN BECOMING BLK BELOW 2531M, MOD HD TO OCC MOD SFT, MOD FIS, ABUN SPLINTER, CURVILINEAR AND OCC BLKY, NONCALC TO TR DOL, SMOOTH TO GRITTY TEX W/ ABUN F TO OCC C SND EMBD, V F MICROBEDS OF V F GR TAN SST AND BLK MICROCARB MAT, OCC SLTY, VAR ABUN OF F DISSEM BLK MICROCARB MAT, OCC SLTY, VAR ABUN OF F DISSEM BLK MICROCARB, MICA AND PY. CLR CRUSH CUTS W/ A MOD BRT, MOD INTENSE, LT YEL FLUOR LEAVING A CLR DES RNG OF BRT CANARY YEL FLUOR.

SLTST: M DK BRN W/ V GRITTY TEX FROM SND, SPEC LSTR FROM ABUN MICMICA (MUSC), NONCALC TO SLI TR DOL, MOD SFT AND SUB-FRI (AS SNDY), SUB-FIS (AS SHALY), TR TO GD TR SLTY SH EQUIV W/ INCR CLY, ABUN DISSEM BLK MICROCARB, TR TO GD TR LT TAN, ANG CLY FRGS, RARE V F DISSEM MICROPY. CRUSH CUTS CLR W/ NUANCE OF LT YEL FLUOR LEAVING A CLR DES RNG OF EXTR LT YEL FLUOR.

COAL: BIT, BLK, MOD HD, BRIT, GLOSSY, CONCH AND BLKY FRAC, TR PY. CRUSH CUTS CLR W/ BRT, INTENSE, MOD TRANSP, LT YEL FLUOR LEAVING A CLR DES RNG OF BRT, LT CANARY YEL FLUOR.

DOL: LT TO DK TAN TO DK RD-BRN, MICRITIC TO MICROXTLN, EXTR HD, DNSE, BRIT, CONCH FRAC, VAR SLTY AND SNDY, ABUN MICA, TR TO V ABUN F DISSEM BLK MICROCARB AND PY. DULL YEL-BRN MIN FLUOR. 0-10% VIS POR. CRUSH CUTS CLR W/ MOD BRT AND INTENSE, LT YEL FLUOR LEAVING A CLR DES RNG OF MOD BRT LT YEL FLUOR.

SECTION CHARACTERIZED BY ABUN V THIN "VARVE-TYPE" MICROBEDDING ESP BETWEEN SST AND SHALE FROM 2439-2504M.

DOL LMST: WH, LT TO M TAN, LT TO M BRN TO REDDISH-BRN, MOTTLED, MOD TO EXTR HD, DNSE, V BRIT, MICROXTLN TO MICRITIC, OFTEN CLASTIC W/ TR TO ABUN BLK MICROCARB, SLT AND V F SND GRS. VIS POR 0-20%. BRT YEL TO DUL YEL-BRN MIN FLUOR. CRUSH CUTS CLR W/ MOD BRT, INTENSE, HIGHLY TRANSP, LT YEL FLUOR LEAVING A CLR DES RNG OF BRT, LT YEL FLUOR.

2563-2584M

PUMICE: BLK TO SILVERISH BLK W/ A HIGH GLOSSY TO MET LSTR, V HD, V BRIT, HIGHLY VES W/ LARGE SPHEROIDAL VES (2MM) TO ELONG AND FLATTENED TUBES TO V F SPHER VES GRD TO A BLK GLASS. ELONG WAVY VES TUBES DISPLAY FLOW STRUCTURES, OCC CLR AMORPHOUS QTZ NODULES INFIL VES AND SUB TO EUHED XTLN CALC, OCC ANHED PY INFIL VES.

SHALE: BLK, HD, DNSE GRD T PHYLLITIC SH, HD, DNSE, BRIT, BLKY, TO SUB-FIS, NON-CALC, MICMICA, MOD HIGH GLOSSY LSTR.

TUFF: LT GRY TO TAN-CRM, WELDED ASHY TUFF(?) OR POSSIBLE UPPER CHILLED CONTACT(?), V F GLASSY AND MASS TO BNDED W/ LT AND M GRY, V HD, FIRM, BRIT, OCC W/ F GR CLR VIT RND QTZ AND GRD TO TUFFACEOUS SST, SL TO MOD CALC.

2584-2612M

DOLERITE/GABBRO: LT COLORED W/ MLKY-WH, CRM, CLR VIT, LT GRN, LT GRY, TAN TO BRN, DK GRN, BLK AND DK RD-BRN CRYPTOXTLN TO GLASSY GROUND MASS W/ TABULAR PHENOCRYSTS OF FELD (PLAG?) AND QTZ (DECREASING W/ DEPTH). ABUN ANHED MASSES TO TIGHTLY CLUMPED BOOKS OF DK RD-BRN BIOTITE, ABUN LT TO DK GRN, SHORT, BLOCKY PRISMS OF PYROXENE, ABUN LONGER DK RD-BRN TO GRN-BLK NEEDLE-LIKE COLUMNS OF HORNBLENDE, ABUN LT COLORED APATITE, ABUN SMALL DNSE ANHED TO DODECAHEDRAL DK BRN TO BLK OPAQUE GARNET INCREASING BELOW 2597M. PLAG FELD INCREASE W/ DEPTH WHILE QTZ CONTENT DECREASES. ALL IGNEOUS FRAG MOD CALC.

2612-2651M

GABBRO: F TO M GR DOM MLKY WH ANHED FELD (PLAG) GEN AS TABULAR XTLS AND DK GRN PYROXENE W/ ABUN DK RD-BRN LONG VIT XTLS OF AMPHIBOLE AND DK RD-BRN BOOKS OF BIOTITE. FELD GEN HIGHLY ALTERED TO CLYS, CALC AND CHLORITE. OCC BLK TO DK BRN OPAQUE GARNETS(?). ABUN CLR CALC VENEER. RK GEN GETS COARSER XTln W/ DEPTH.

2651-2672M

QTZITE: CLR, VIT, F TO M GR REXTLIZED TO INTERLOCKING EUHED QTZ XTLS, V HD AND TIGHTLY CMT W/ CLR TO MLKY QTZ. ABUN V F BANDS OF TAN TO LT AND M GRY HIGHLY SIL RK FRAG, V HD, V BRIT. BELOW 2663M: PATCHY M BRN DEAD OIL STN AND SL VIS POR (5%). CLR CRUSH CUT W/ A.PL TO MOD BRT TRANSP BL-WH CUT FLUOR AND MOD BRT YEL-WH DES RNG FLUOR.

SHALE: DK BRN TO BLK BECOMING LTER W/ DEPTH, MOD SFT TO HD, DNSE, BLKY TO SUBFIS, OCC FIS, FNT LINEATIONS AND MICA ALIGNMENT, GLOSSY TO MORE EARTHY W/ DEPTH, TR CALC, TR TO ABUN SLT AND V F SND.

SHALES FROM 2651-72M APPEAR TO BE MOD METAMORPHOSED (PHYLLITIC) GEN BEING V MICACEOUS AND SHOWING GOOD MICA ALIGNMENT. THESE SHALES REPRESENT THE LOWER THERMAL CONTACT.

2672-2713M

SHALE: DK BRN TO OCC BRN-BLK BECOMING M GRY-BRN TO M BRN, MOD SFT, BLKY TO SUB FIS, NON TO TR CALC, ABUN MICMICA AND MICROCARB - ORG RICH, OCC PY NOD AND SMEARS, SL TO V SLTY.

SLTST: M GRY-BRN TO LT GRY-TAN, MOD SFT TO OCC HD (CALC), V ARG (40-50% SHLY MAT), ABUN MICMICA AND MICROCARB, GEN NON TO TR CALC, OCC PY.

SST: V THIN LAM OF LT TAN, V F TO F GR SST, SUBRND, MOD W SRT, MOD HD BUT EASILY FRI, V W CMT W/ TAN CLY (25%), MICA, MICROCARB. 5% VIS POR (CLAY CHOKED).

DOL: V THIN LAM, M RD-BRN, BLKY, V HD, V DNSE, BRIT, CRYPTOXTLN W/ OCC RHOMBIC AGGREGATES ASSOC W/ MICA FLAKES, MICROCARB, OCC CLR QTZ FRAG. NO VIS POR.

ALL LITHOLOGIES IN INTERVAL GIVE A CLR CRUSH CUT W/ A PL TO BRT TRANSP TO MLKY BL-WH CUT FLUOR AND A MOD BRT BL-WH DES RNG FLUOR.

2713-2807M

SHALE: DK BRN-GRY TO GRY-BLK W/ OCC M BRN BELOW 2729M AND TAN (SLTY) BELOW 2735M, BLKY TO SUBFIS AND INCR ABUN OF CURVILIN AND BLADES, MOD HD W/ OCC HD AND MOD SFT, FNT LINEATIONS, NONCALC, V ABUN MICMICA, ABUN MICROPY AND PY AGG, LOCALLY V ORG RICH AND ABUN MICROCARB OCC GRD TO LIGNITIC, OCC V SLTY W/ SLTST LAM AND OCC TR SNDY. BRT TRANSP TO SL MLKY BL-WH CRUSH CUT FLUOR.

BRNSH SH CUTS BETTER THAN GRY-BLK SH AND IS GEN SLTIER AND MORE ORG RICH.

SST: LT TAN, V F GR BECOMING F GR W/ DEPTH, OCC M GR, CLR VIT TO MLKY QTZ, RND, W SRT, MOD SFT AND EASILY FRI, W CMT W/ TAN CLY (20%), NONCALC, ABUN MICMICA, MICROPY, OCC MICRO LAM OF CARB MAT AND SHALE. 10-15% VIS POR. EVEN MOD BRT YEL FLUOR, V PL STRW CRUSH CUT, V BRT MLKY BL-WH FAST STRMG TO INSTANTANEOUS CUT FLUOR, BRT YEL-WH DES RNG FLUOR. BELOW 2735M: PL TO MOD BRT TRANSP TO SL MLKY BL-WH CRUSH CUT FLUOR W/ A MOD BRT BL-WH DES RNG FLUOR.

SLTST: TAN SH BECOMES SLTIER W/ DEPTH, TRUE SLTST BELOW 2795M. LT TAN TO M BRN OCC GRY-TAN, MOD SFT, FRI, V SHLY (40%), FNT LINEAT, ABUN MICROCARB AS DISCRETE AND BNDS, V ABUN MICMICA, OCC PY, OCC F GR SNDY, NON TO TR CALC. BRT MLKY TO TRANSP OCC SLW STRMG BL-WH CRUSH CUT FLUOR.

DOL: V THIN LAM, M TO DK BRN AND BRN-GRY, CRYPTOXTLN, V HD, V BRIT, OCC SIL, CONCH FRAC, V ARG, ABUN DISCRETE MICROCARB. NO VIS POR. PL BL-WH CRUSH CUT FLUOR.

2807-2830M

SST: MLKY WH TO CLR VIT, DOM M TO C GR W/ V C TO V F GR, DOM SUBRND W/ ABUN ANG, SUB TO EUHED QTZ XTLS, MOD W TO OCC V PR SRT, MOD HD TO SFT, EASILY FRI TO OCC BRIT, W CMT W/ WH CLY AND OCC SL SIL, LOCALLY ABUN RELICT FELD ALTERED TO TAN-WH CLY, ABUN CLR MICA, MOD ABUN DK MIN, OCC PY, OCC MICROCARB AS DISSEM AND BNDS. GEN BECOMES SL COARSER W/ DEPTH. VIS POR 25% W/ W CMT FRAG TO 5%. LOCAL PATCHES OF LT BRN OIL STN AND DK BRN RESINOUS DEAD OIL STN (HEAVY RESIDUAL). PATCHY TO EVEN DULL TO MOD BRT YEL FLUOR, CLR CRUSH CUT, DULL TO MOD BRT TRANSP TO MLKY BL-WH CUT FLUOR, MOD BRT BL-WH DES RNG FLUOR.

2830-2839M

SLTST: TAN-WH TO LT BRN AND GRY, MOD SFT, V SHLY, ABUN MICROCARB AS DISCRETE AND BNDS, OCC SNDY, TR CALC. V BRT TRANSP BL-WH CRUSH CUT FLUOR (OCC SLW STRMG).

2839-2900M

SLTST: TAN AND GRY-BRN, MOD HD TO MOD SFT, EASILY FRI, V SHLY (40%), FNT LIN AND BNDS OF CARB MAT, ABUN MICMICA, ABUN MICROCARB, OCC PY, OCC F SNDY, MOD ABUN DK MIN, NON TO TR CALC. CLR CRUSH CUT, MOD BRT TRANSP TO SL MLKY BL-WH CRUSH AND OCC SLW STRMG CUT FLUOR W/ MOD BRT BL-WH DES RNG FLUOR.

SST: TAN AND CRM-TAN TO WH, DOM F GR W/ OCC V F AND M, CLR TO MLKY QTZ GRS W/ ABUN CLR VIT, SUB TO OCC EUHED QTZ XTL, SUBRND, MOD W SRT, MOD SFT, EASILY FRI, W CMT W/ TAN AND WH CLY, TR TO MOD ABUN CARB MAT, MICMICA, NON TO TR CALC. 10 (ABUN CLY) TO 25% VIS POR. PATCHY TO EVEN DULL YEL FLUOR, CLR CRUSH CUT, SLW STRMG MOD BRT MLKY TO TRANSP BL-WH CUT FLUOR W/ MOD BRT YEL-WH DES RNG FLUOR.

SHALE: M BRN, OCC DKER GRY-BRN, SUBFIS TO OCC BLKY AND OCC CURVILIN, FNT LIN, MOD HD TO MOD SFT (BECOMING SUBSTAN SFTER AND DISPERSABLE IN 10% HCL BELOW 2890M), MOD SLTY, ABUN MICMICA, ABUN MICROCARB AS AGG AND BNDS AS WELL AS DISSEM, MOD ABUN PY, NON TO TR CALC. CLR CRUSH CUT, MOD BRT TRANSP TO SL MLKY BL-WH CRUSH CUT FLUOR.

2900-2941M

SHALE: DOM M BRN AND M GRY-BRN W/ APPROX 20% DK GRY. DK GRY: MOD HD TO MOD SFT. SUBFIS TO CURVILIN, TR SLTY, NON TO TR CALC, GEN GLOSSY SURF, OCC V ORG RICH GRD TO LIGNITIC, ABUN MICMICA AND MICROCARB, OCC F DISSEM AND AGG OF PY. M BRN: GEN MOD SFT, OCC MOD HD, V SLTY GRD TO SLTST AND OCC F SANDY. ABUN ORG MAT AS F DISSEM AND BNDS, FNT BDNG LIN, NON TO SL CALC. DK GRY: NONE TO SL TR V PL CRUSH CUT FLUOR. M BRN: CLR CRUSH CUT, MOD BRT TRANSP TO MLKY BL-WH CRUSH CUT FLUOR AND A MOD BRT YEL-WH DES RNG FLUOR.

SLTST: M BRN TO TAN-GRY, OCC GRY-BRN, MOD SFT OCC MOD HD, EASILY FRI, V SHLY (40%) GRD TO SLTY SHALE, FNT BDNG LIN, ABUN MICMICA, ABUN CARB MAT AS DISCRETE AND LAM, OCC PY, DK MIN, OCC F SNDY, NON TO TR CALC. CLR CRUSH CUT, MOD BRT TO BRT TRANSP TO MLKY BL-WH CRUSH CUT FLUOR AND MOD BRT BL-WH DES RNG FLUOR.

SST: TAN TO GRY-TAN TO OCC WH, CLR TO SMKY GRS AND CLR VIT SUBHED XTLS. V F TO F GR, OCC LOCAL M GR, MOD W SRT, SFT AND MOD SFT, EASILY FRI, W CMT W/ WH AND TAN CLY. ABUN CLR MICA, MOD ABUN CARB MAT AS DISCRETE AND OCC RESINOUS BNDS, OCC DK MIN. 5% (W CMT) TO OCC 20% VIS POR. LOCAL PATCHY M BRN RESINOUS DEAD(?) OIL STN, FNT TO MOD BRT TRANSP TO MLKY BL-WH CRUSH AND V SLW STRMG CUT FLUOR, FNT TO MOD BRT BL-WH DES RNG FLUOR.

ABUN IGN SLOUGH IN SAMPLES FROM 2900-50M.

2941-3022M

SHALE: DOM M BRN TO GRY BRN W/ 10-30% DK GR TO BLK. BRN: MOD SFT, GEN V SLTY GRDNG TO V SHLY SLTST, NO DISTINCT BRKAGE, FNT LAM, ABUN CARB MAT AS DISCRETE RESINOUS SPECS AND PLANT FRAG AND WISPY BNDS, NON TO TR CALC, ABUN MICA, OCC PY AS DISSEM AND AGG, OCC DK MIN, OCC F SNDY. GEN MOD BRT TRANSP TO MLKY CRUSH CUT FLUOR (OCC BRT) AND MOD BRT YEL-WH TO BL-WH DES RNG FLUOR. DRK GRY: SUB-FIS TO FIS W/ OCC BLKY AND SL CURVILIN, MOD HD TO MOD SFT, MOD BRIT, GLOSSY TO RESINOUS SURFACE, TR CALC, ABUN MICROCARB, MICMICA AND F DISSEM AND AGG OF PY, OCC MOD SLTY. GEN FNT TO MOD BRT TRANSP BL-WH CRUSH CUT FLUOR W/ A MOD BRT BL-WH DES RNG FLUOR.

SLTST: M TAN-BRN TO BRN-GRY, MOD SFT, MOD FRI, NON TO TR CALC, FNT BDNG LAM, ABUN CARB MAT IN DISCRETE SPECS AND FRAG TO RESINOUS BNDS, ABUN MICMICA, OCC PY, SLTST IS V SHLY GRD TO SLTY SH, OCC F SNDY. GEN BRT TO OCC V BRT TRANSP TO SL MLKY BL-WH CRUSH AND OCC SLW STRM CUT FLUOR W/ A BRT YEL-WH TO BL-WH DES RNG FLUOR.

SST (2952-63M): LT TAN TO TAN-GRY, V F TO F GR, ANG TO SUBANG, DOM CLR VIT SUBHED QTZ, MOD SFT, V FRI, MOD W CMT W/ TAN AND WH CLY AND PYROBIT, MICA, OCC DK MIN, NON CALC. VIS POR 10-25%. PATCHY TO EVEN LT TO M BRN OIL STN ESP IN CLY MTX. BRT EVEN YEL FLUOR, CLR CRUSH CUT, BRT TO V BRT INSTANTANEOUS TO FST STRMG MOD MLKY BL-WH CUT AND CRUSH CUT FLUOR, BRT BL-WH DES RNG FLUOR.

SST (BELOW 2970M): TAN TO WH, DOM M GR W/ OCC C AND V C LOOSE QTZ AND VAR AMTS OF F GR W/ TAN CLY, CMT, SMKY GRS AND CLR VIT SUB TO OCC EUHED XT LN QTZ, DOM ANG TO SUBANG, LOCALLY MOD W SRT, M GR DOM AS LOOSE AND UNCONSOL, V FRI, OCC TAN CLY CMT, NON-CALC, ABUN MICROCARB AN MICA. VIS POR 10-20%. PATCHY M BRN RESINOUS DEAD(?) OIL STN AND PATCHY TO EVEN LT BRN OIL STN, PL TRANSP BL-WH CRUSH CUT FLUOR W/ BL-WH DES RNG FLUOR. NO NATURAL FLUOR.

COAL: BLK TO DK BRN-GRY, SUBBIT TO LIGNITIC AND GRD TO LIGNITIC SHALE, FIS TO BLKY, SFT TO MOD SFT, EASILY CRUMBLD, SHLY, MOD GLOSSY TO RESINOUS SURFACE, ABUN F DISSEM PY, BNDS OF RESINOUS ORG MAT. V BRT INTENSE INSTAN TRANSP BL-WH CUT FLUOR, BRT ORNG-YEL DES RNG, M BRN RESIDUE.

3022-31M

VOLCANICS (PYROCLASTICS AND ASSOC FLOW): LT GRYISH-WH MOTTLED W/ GRY, HD TO OCC MOD SFT, WEATHERED TO CLYS GEN W/ RELICT BDNG AND FLOW BNDG(?), ABUN FELD XTLS IN VARIOUS STAGES OF DEGENERATION - CLR VIT SUBHED TO WH KAOLINITIC RELICTS, ALL CRUSH EASILY TO A F WH POWDER. MOD ABUN OF CLR VIT QTZ, SL CALC, OCC SPECS OF DK MIN - BLK, GRN, DK GRY, RD-BRN.

CLYEY SST: CLOSELY ASSOC W/ THE VOLC MAT, GRY-WH, V F TO F GR, ANG TO SUBANG, MOD PR SRT, MOD SFT, ABUN CLY MTX AND DEGENERATED FELD, MOD ABUN BLK ORG MAT, TR BLK MAFICS, TR MICA.

3031-3048M

VOLCANICS: V HIGHLY WEATHERED THOLEIITIC BASALT(?), F XT LN, VARICOLORED W/ CRM-WH, LT GRY, PNK, GRN AND TAN, DOM WH FELD (PLAG?) RELICTS ALTERED TO WH CLY AND LT TO DK GRN PYROX WEATHERED TO CHLORITES, ABUN FREE QTZ, MANY FRAG V SFT.

3048-3067M

BASALT: DOM M GRY TO GRN-GRY W/ LT PATCHES OF CRM TO WH, MOTTLED W/ GRN, TAN AND DK BRN, GLASSY TO CRYPTOXT LN W/ F SUBHED PLAG AND V F DK GRN TO BLK PYROX(?), OCC FNT BNDS (FLOW STRUCTURES?), MOD ABUN CALC AND FREE QTZ. GEN QUITE FRESH AND UNWEATHERED, EXT HD. BETTER XT LNTY DEVELOPS BELOW 3061M.

3067-3347M

BASALT: GEN HIGHLY ALTERED W/ OCC FRESHER ZONES AND OCC ASSOC PYROCLASTICS AND GLASSY INTERVALS. GLASSY TO CRYPTOXT LN AND SEMIXT LN TO HOLOXT LN, F GR APHANITIC AND PORPHYRITIC TEXTURE, GEN M TO DK GRN-GRY TO GRY W/ ABUN VARICOLORED ALTERNATION PRODUCTS: WH, CRM, TAN, BRN, GRN, RD, BLK, PNK, PURPLE, YEL, BL. DOM RELICT AND FRESH F GR TABULAR GRN-GRY PLAG AND DKER GRN PYROX W/ ABUN AMPHIBOLE (HORNBLende?), BIOTITE AND DK GRY-BLK MAGNETITE(?), MOD ABUN LT LIME GRN OLIVINE BELOW 3076M, MOD ABUN APATITE, ABUN CHLORITE AND SERPENTINE(?) AS ALT PRODUCTS, CARBONATE (DOL AND CALC) AS ALT PRODUCTS, VEINS AND VEINLETS; MOD ABUN RD-BRN TO BLK IRON OXIDES AND SULPHIDES(?). ABUN FILLED AND OPEN AMYGDULES DEVELOPED DEEPER IN SECTION. RK IS VAR IN HDNESS.

SIDEWALL CORE DESCRIPTIONS

YOLLA-1

SIDEWALL CORES - YOLLA-1

A piggy-back gun of sidewall cores was shot on log suite No. 3 in Yolla-1. A total of 51 shots were attempted and 48 were recovered.

Because of the common occurrence of hydrocarbons in the sidewall cores, a rating system was devised to emphasize those sands that had the best hydrocarbon shows, and as a corollary, those sands that might be oil-prone.

The hydrocarbon rating scheme is as follows:

Rating	Hydrocarbon Features
NIL	nil hydrocarbon to a dessication ring only
TRACE	crush cut and dessication ring only
POOR	cut, crush cut and dessication ring
FAIR	trace fluorescence, cut, crush cut and dessication ring
GOOD	abundant fluorescence, cut, crush cut and dessication ring
EXCELLENT	live oil stain present, abundant fluorescence, cut, crush cut and dessication ring

According to this scheme, 5 sidewall cores (2974.5 m, 2952.5 m, 2874 m, 2813 m, 1835 m) were adjudged to have an excellent hydrocarbon rating and are probably light oil-bearing. The remainder of the cores were rated as poor to fair and are probably gas-saturated.

No.	Depth (m)	Rock Type	Grain Size	Matrix/Cement	Porosity(%)	Stain	Fluorescence	Out	Crush Out	Dessic. Ring	Rating
1	3028	Cly Sst	Vf-f	Wh & brn cly	10-20	Spotty, lt brn	Dull yel-brn	Clr, v transp lt yel	Clr, mod transp lt ylw-wh	Clr, brt gold-yel	Poor
2	3014.5	Sdy Carb Clyst	(vf-f)	-	tr frac por	-	Tr v dull yel-brn	Clr dull lt yel	V lt brn w/bl-wh	Lt brn, v brt gold-yel	Poor
3	3013	Sst	Vf-f	Kaol, tr calc	20-30	V spotty lt brn	V dull yel-brn	Clr, v faint yel	Clr, transp lt yel	Clr, mod brt lt yel	Poor
4	3010	Sst	Vf-f	Kaol, tr calc	10-20	Tr spotty lt brn	Yel-brn	Clr transp dull lt yel	Clr, mod brt lt yel	Clr, mod brt lt gold-yel	Poor
5	3006	Sdy Carb Clyst	(Vf)	-	Tr frac por	Tr spotty lt brn	Spotty dull yel-brn	Clr, brt lt yel bl-wh	Clr, brt transp, lt yel bl-wh	Lt brn, v brt gold-yel	Poor
6	3002.5	Cly Sst	Vf-f	Abnt Kaol (?)	10-20	Tr lt brn	Mod even v dull yel-brn	Clr, faint yel	Clr, mod brt transp, lt yel	Clr, mod brt lt yel	Poor
7	2994	Cly Sst	Vf-f	Kaolin (?)	10-20	Tr lt brn	Tr dull yel-brn	Clr, dull yel	Clr, mod brt transp, lt yel	Clr, mod brt lt yel	Poor
8	2992	N.R.	-	-	-	-	-	-	-	-	-
9	2988	Cly Sst	Vf-f	Mod Clayey	10-20	-	Mod even med yel-brn	Clr, transp lt yel	Clr, v brt transp, med yel	Lt brn, mod dull yel	Poor
10	2985	Sst w/Clyst	Vf	Kaolinitic (?)	10-20	Tr lt brn	Tr dull yel-brn	Clr, v brt transp, lt yel	Clr, v brt transp, lt yel bl-wh	Med brn, brt yel-gold	Poor
11	2974.5	Cly Sst	Vf-f	Abun Kaol (?)	15-25	Tr spotty lt brn	Spotty dull gold yel	Clr, v brt bl-wh	Clr, v brt transp, bl-wh	Clr, mod brt lt yel bl-wh	Excellent
12	2970	Clyst	-	-	-	-	-	Clr, v pl yel	Clr, v brt transp bl-wh	Med brn, v brt yel-gold	Poor
13	2960.5	Sltly Sdy Clyst	(Vf)	-	-	Tr lt brn	Tr dull yel-brn	Clr, pl yel	Clr, mod brt transp yel-bl-wh	Clr, mod brt lt yel	Poor
14	2952.5	Cly Sst	Vf-f	Bent-Kaol (?)	10-25	Patchy lt brn	Even-patchy mod brt lt-yel	V brt, transp yel bl-wh	Lt brn, brt transp lt yel-bl-wh	Lt brn, brt med yel	Excellent
15	2945	Clyst	-	-	-	-	-	Clr, lt yel	Clr, lt bl-wh	Clr, lt yel	Poor
16	2885	Clyst	-	-	Frac Por	-	-	Tr v lt yel	Clr, transp med lt yel	Clr, mod brt lt yel	Poor
17	2879.5	Sst	Vf	Abnt Kaol (?)	10-20	Tr lt brn	Tr dull yel-brn	Clr, v lt yel	Clr, mod brt transp lt yel	Clr, mod brt yel	Poor
18	2874	Sst	Vf	Abnt Kaol (?)	20-30	Tr v lt brn	Pl dull yel-brn	Clr, mod brt v lt yel	Clr, v brt transp yel-bl-wh	Clr, mod brt yel	Excellent

No.	Depth (m)	Rock Type	Grain Size	Matrix/Cement	Porosity(%)	Stain	Fluorescence	Out	Crush Out	Dessic. Ring	Rating
19	2845.5	Sst	Vf-f	Bent-Kaol (?)	15-25	Rare v lt brn	Rare v lt dull yel	-	Clr, v lt yel	V pl yel	Poor
20	2841.5	Sst	Vf	Bent-Kaol (?)	15-25	Rare v lt brn	Rare v lt dull yel	Rare v faint yel	Clr, v lt yel	V pl yel	Poor
21	2828.5	Sst	Vf	20-40% mod calc Bent-Kaol (?)	15-25	Mod even v lt brn	V lt dull yel	-	Clr, pl yel	V pl yel	Poor
22	2823.5	Sst	Vf-f	20-25% mod calc Bent-Kaol (?)	25-30	Mod even v lt brn	Tr v lt dull yel	Clr, v pl yel	Clr, med lt yel	Clr, med yel	Poor
23	2820	Sst	Vf-f	Kaol (?)	20-30	Rare v lt brn	Rare v dull yel-brn	Clr, v lt yel-bl-wh	Clr, v brt transp bl-wh	V lt brn, v, brt, gold-yel	Poor
24	2813	Sst	Vf-f	Kaol (?)	20-30	Spotty lt brn	25% patchy pl bl-wh	Clr, mod brt lt yel	Clr, v brt transp, lt yel	Clr, mod brt v lt yel	Excellent
25	2810	Sst	Vf	Mod Abnt Kaol (?)	20-25	Rare v lt brn	Rare yel-bl-wh	Clr, med yel	Clr, mod brt transp, lt yel	Clr, mod brt lt yel	Poor
26	2763*	Sst	Vf-f	Kaol (?)	Indeterminate	Rare v lt brn	Rare v lt dull yel-brn	Indeterminate	Indeterminate	Indeterminate	Fair
27	2759.5	Sst	Vf-f	Kaol (?)	15-25	Rare lt brn	Rare dull yel-brn	Clr, v lt yel-bl-wh	Clr, mod brt transp, lt yel-bl-wh	Clr, mod brt lt yel	Poor
28	2756	Sst	Vf	20-40% Kaol(?)	15-20	Uneven v lt brn	Uneven v lt dull yel	Clr, mod lt yel	Clr, mod brt lt yel	V lt dull yel	Poor
29	2731	Clyst	-	-	Frac por	-	-	Clr, v faint yel	Clr, mod brt transp, lt yel	Clr, med yel	Poor
30	2725.5	i/b Sst & Clyst	Vf-f	20-30% tr calc kaol (?)	15-20	Patchy v lt brn	V pl yel	Clr, mod lt yel	Clr, v brt transp, med yel	Clr, mod brt canary yel	Fair
31	2720	Sst	Vf-f	30% tr calc kaol (?)	25	Mod even v lt brn	Mod even v lt dull yel	Clr, mod brt transp, lt yel	Clr, mod brt, transp, med lt yel	Clr, dull med yel	Poor
32	2642.5	N.R.	-	-	-	-	-	-	-	-	-
33	2636	Igneous	-	-	-	-	-	-	-	-	-
34	2630	Clyst w/Sst	Vf	Kaol (?)	10	Rare lt brn	Rare dull yel-brn	Clr, mod brt pl yel-bl-wh	Clr, mod brt transp, yel-bl-wh	Clr, mod brt lt yel	Poor
35	1894	N.R.	-	-	-	-	-	-	-	-	-
36	1868	Sst	Vf-f	Kaol (?)	20-30	Spotty v lt brn	V faint dull yel	-	Clr, v faint yel	-	Poor
37	1860	Cly Sst	Vf	Kaol (?)	15-20	Gd tr spotty v lt brn	Rare dull yel-brn	-	Clr, mod brt, transp lt yel	Clr, v lt yel	Poor

*Poor Sample.

No.	Depth (m)	Rock Type	Grain Size	Matrix/Cement	Porosity(%)	Stain	Fluorescence	Out	Crush Out	Dessic. Ring	Rating
38	1855	Cly Calc Sst	Vf	20-40% mod calc, Kaol (?)	15-20	Spotty v lt brn	V faint dull yel-brn	Clr, v lt yel	Clr, mod brt transp, med lt yel	Clr, v lt dull yel	Poor
39	1850	Sst	Vf	20% Kaol (?)	25	Even lt brn	Even dull lt yel	Clr lt yel	Clr, mod brt transp, med yel	Clr, mod brt lt yel	Poor
40	1845	Sst	Vf	20-30% Kaol (?)	15-25	Mod even lt med brn	Mod even v dull v lt yel	Clr, med lt yel	Clr, mod brt transp, v lt yel	Clr, mod brt lt yel	Poor
41	1840	Sst	Vf	20-30% Kaol (?)	20-30	Patchy v lt brn	Mod even dull lt yel	Clr, mod brt transp, med yel	Clr, brt transp, lt yel	V lt brn mod brt med yel	Poor
42	1835	Sst	Vf	20-30% Bent-Kaol (?)	20-30	Even lt brn - grains floating	Even, mod brt v lt yel	Clr, mod brt transp, lt yel	Clr, v brt transp, med lt yel	Clr, v lt yel	Excellent
43	1830	Sst w/Clyst	Vf	Kaol (?)	Up to 25	Rare v lt brn	Mod even dull yel-brn	Clr, lt yel	Clr, mod brt transp, lt yel	Clr, v brt lt yel	Poor
44	1825	Cly Sst	Vf	Kaol (?)	10-20	Mod even v lt brn	V uneven v pl, v lt yel	Clr, lt yel	Clr, mod brt transp, med lt yel	Clr, brt lt yel	Poor
45	1820	Sdy Py Clyst	(Vf)	-	Frac Por	-	-	Clr, v faint yel	Clr, mod dull yel	Clr, v dull yel	Poor
46	1815	Cly Sst	Vf	20-40% Kaol(?)	10-20	Uneven lt brn	Uneven v lt yel	Clr, v pl yel	Clr, mod brt transp, lt yel	Clr, mod lt yel	Poor
47	1810	Sdy Py Clyst	(Vf)	-	-	-	-	Clr, v faint yel	Clr, mod brt transp, lt yel	Clr, v lt yel	Poor
48	1805	Sdy Py Clyst	(Vf)	-	-	-	-	Clr, mod brt lt yel	Clr, v brt transp, v lt yel-bl-wh	Clr, mod brt med lt yel	Poor
49	1795	Clyst	-	-	-	-	-	Rare v lt yel	Clr, v lt yel	Clr, mod dull yel	Poor
50	1785	Clyst	-	-	-	-	-	Clr, v lt yel	Clr, mod brt transp, med lt yel	Clr, mod brt yel	Poor
51	1765	Clyst	-	-	-	-	-	Rare v lt yel	Clr, v lt dull yel	Clr, v lt yel	Poor

SIDEWALL CORE DESCRIPTIONS

Core No. 1 Well: Yolla -1

Depth: 3028m (9934.3')

Rock Type: Clayey Sandstone

Pull: 381.7 lbs

Recovered: 1.5cm (0.59")

Condition: Broken

Description:

Clayey Sandstone: Macro gry-wht, brnsh-gry to med brn mottled w/blk in one thin bed; micro dom gry-wht w/abund med to dk brn cly frags and beds and one blk to "rust" brnsh-blk resinous, fusain-type coal bed; v/fn-minor fn, mod poor sort; ang to minor sub-ang, gry-to brnsh-frsted w/abund clr qtz and feldsp w/abund decay kaolin (?) as dom non-calc matrix w/v/minor variably brn cly matrix segments; tr to v/abund blk to brnsh-blk microcarb; tr blk mafics (?); tr mica (musc); rare dk reddish-brn, anhedral garnet (?); vis por 10-20%.

Core No. 2 Well: Yolla -1

Depth: 3014.5m (9890')

Rock Type: Sandy, Carbonaceous Claystone

Pull: 1096.0 lbs

Recovered: 1.5cm (0.59")

Condition: Broken

Description:

Sandy, Carbonaceous Claystone: Macro med dk "chocolate" brn; micro even med dk brn w/gd tr to abund scattered specular reflection from micromica (musc); mod soft to gd tr v/hd; sub-fis as "shaley", tr calc (10% HCI) and mod crypto-fis; non-hydratable; gd tr to v/abund v/fn-fn, ang, brn-frsted to minor gry-frsted qtz and feldsp grains; tr appar fracture por.

Core No. 3 Well: Yolla -1

Depth: 3013m (9885.1')

Rock Type: Sandstone

Pull: 1188 lbs

Recovered: 2cm (0.79")

Condition: Broken

Description:

Sandstone: Macro med gry-tan to gry-brn mottled w/thin, dk brn "bands"; micro med gry to med tan and gry tan mottled w/blk carbonaceous microbeds; v/fn-fn and mod poor sort; dom lt to gry-frsted w/v/minor lt brnsh-frsted, ang to sub-ang (esp clr) qtz and minor feldsp in variably tan, appar decay matrix of dom tr calc. kaolin (?); tr dissem blk microcarb to banded concentrations of dissem blk microcarb bet microbeds of blk, glossy, conchoidal, vitrain-type bituminous coal; vis por 20-30%.

Core No. 4

Well: Yolla -1

Depth: 3010m (9875.2')

Rock Type: Sandstone

Pull: 822 lbs

Recovered: 1cm (0.39")

Condition: Broken

Description:

Sandstone: Macro gry-tan and lt to med brn mottled; micro gry-tan and med brn mottled; v/fn-fn, mod poor sort; ang to minor sub-ang, rare subhedral, grysh-to brnsh-frsted and clr to gd tr vitreous dom qtz w/minor feldsp in abund decay kaolinitic (?), tr calc matrix of dom gry-wht color when water-inundated; mod hd and fri w/mod pres; tr to gd tr blk dissem microcarb; vis por 10-20%.

Core No. 5

Well: Yolla -1

Depth: 3006m (9862.1')

Rock Type: Claystone

Pull: 553.5 lbs

Recovered: 2cm (0.79")

Condition: Broken

Description:

Sandy, Carbonaceous Claystone w/Sandstone beds: Macro dom med dk "chocolate" brn w/med gry-wht thin (1-3mm) beds; micro variably med to dk brn clystn w/gry-wht ss microbeds and lt to med gry-wht ss macrobeds; ss v/fn, mod well sort w/ang, dom frosted w/minor clr, dom ang qtz and feldsp w/abund gry-wht, non-calc, kaolinitic (?) matrix, giving mod soft, extr fri character; clystn mod hd w/gd tr to extr abund equiv sd and ss incl a gd tr to v/abund dissem to tr bedded microcarb w/ tr to abund micromica (musc); tr vis fracture por in clystn and 5-10% vis ss por.

Core No. 6

Well: Yolla -1

Depth: 3002.5m (9850.6')

Rock Type: Clayey Sandstone

Pull: 1141 lbs

Recovered: 1.9cm (0.75")

Condition: Solid

Description:

Clayey Sandstone: Macro med gry-tan; micro med gry-wht to gry-tan mottled; v/fn-fn, ang to v/minor sub-ang, grysh-to brnsh-frsted to clr qtz and feldsp in abund tan-wht to lt tan, non-calc, kaolinitic (?) matrix; tr to gd tr dissem blk microcarb; vis por 10-20%.

Core No. 7

Well: Yolla -1

Depth: 2994m (9822.7')

Rock Type: Clayey Sandstone

Pull: 1347 lbs

Recovered: 2cm (0.79")

Condition: Solid

Description:

Clayey Sandstone: Macro lt brn and gry-tan mottled; micro gry-wht, gry-tan to lt brn mottled; v/fn-fn, mod poor sort; ang to sub-ang, grysh-to brnsh-frsted and clr dom qtz w/minor feldsp in matrix of non-calc, tan-wht to gry-wht kaolin (?); gd tr dissem blk microcarb; rare dk reddish-brn, anhedral garnet (?); vis por 10-20%.

Core No. 8

Well: Yolla -1

Depth: 2992m (9816.2')

Rock Type:

Pull: 1574 lbs

Recovered: No Recovery

Condition:

Description:

Core No. 9

Well: Yolla -1

Depth: 2988m (9803')

Rock Type: Clayey Sandstone

Pull: 1623 lbs

Recovered: 3.5cm (0.72")

Condition: 2.3cm (0.91") solid

Description:

Clayey Sandstone: Macro med grysh-brn; micro med gry w/abund mot med gry-brn and med dk brn opposing streaks; v/fn to minor fn w/mod gd sort, ang to minor sub-ang to abund subhedral dom grysh-frsted to abund clr (subhedral) qtz w/v/minor feldsp; tr mica (musc); tr blk mafics (?); dom med clayey w/abund sdy clystn fragments and lattice-type forms w/cly med to highly hydratab;e (bentonitic ?); mod soft and v/easily fri w/sdy clystn portions highly plastic; non-calc (10% HCI); vis por = 10-20%.

Core No.10

Well: Yolla -1

Depth: 2985m (9793.2')

Rock Type: Sandstone w/Claystone

Pull: 732.5 lbs

Recovered: 2.2cm (0.87")

Condition: Broken

Description:

Sandstone w/Claystone: Macro med gry-tan (ss) w/dk brn frags and "layers" (clystn); micro lt gry to gry-wht ss and dk reddish-brn clystn; ss v/fn, mod poor sort; ang to sub-ang, frsted to clr qtz and minor feldsp in a crmy-wht to gry-wht, non-calc, kaolinitic (?) matrix; clystn non-calc, tr sdy and highly blk to reddish-blk microcarbonaceous w/gd tr micromica (musc); ss vis por 10-20%.

Core No.11

Well: Yolla -1

Depth: 2974.5m (9758.7')

Rock Type: Clayey Sandstone

Pull: 1492 lbs

Recovered: 2.3cm (0.91")

Condition: One 2.0cm (0.79") increment with grains

Description:

Clayey Sandstone: Macro lt brnsh-tan to med brn mottled; micro med gry-wht to med brn w/abund blk mottled; v/fn to fn, mod poor sort; dom ang w/minor sub-ang to sub-rnd, grysh-to brnsh-frsted to minor clr and abund vitreous qtz and feldsp; abund non-calc kaolinitic (?) matrix cly as appar decay product; mod hd easily fri to mod plastic disintegration from cly content; v/abund to abund ang, blk dissem microcarb; tr blk to brnsh-blk mafics (?); tr mica (musc); rare dk reddish-brn, anhedral garnet (?); vis por 15-25%.

Core No.12

Well: Yolla -1

Depth: 2970m (9744')

Rock Type: Claystone

Pull: 582 lbs

Recovered: 1.5cm (0.59")

Condition: Broken

Description:

Claystone: Macro dk brn; micro med dk brn w/abund specular reflections from mica: mod hd and subfis as "shaley"; non-calc; tr to gd tr v/fn-cse silty to v/fn sdy (ang, clr to frsted qtz); tr to gd tr brnsh-blk microcarb layers.

Core No.13

Well: Yolla -1

Depth: 2960.5m (9712.8')

Rock Type: Silty, Sandy Claystone

Pull: 547 lbs

Recovered: 2.2cm (0.87")

Condition: Solid w/frags

Description:

Silty, Sdy Claystone: Macro med lt gry-brn; micro med gry-brn to minor med brn mottled; med hd and subfis as "shaley"; non-calc; variably abund v/fn-cse silt-grade and v/fn, ang, frsted to clr, qtz and feldsp in gd tr (only) grain contact; gd tr dissem micromica (musc) and microcarb; mod hydratable (hygro-turgid).

Core No.14

Well: Yolla -1

Depth: 2952.5m (9686.5')

Rock Type: Clayey Sandstone

Pull: 1602 lbs

Recovered: 2.5cm (0.98")

Condition: Broken to granulated w/one 1.7cm (0.67') segment

Description:

Clayey Sandstone: Macro lt brnsh-gry to lt to med dk brn mottled; micro lt to dk gry-wht and lt to dk brn mottled; very fn to fn and poorly sorted dom ang to abund subhedral and gd tr sharp dom frsted w/abund clr and rare vitreous dom qtz (inc. subhedral) and minor feldsp in a brnsh-tan, glassy-lustered, non-calc bentonitic (?) to lt gry-wht, resinous-lustered, non-calc kaolinitic (?) matrix; mod hd and fri w/mod pres; tr mica (must); tr blk to brnsh-blk mafics (?); vis por 10-25%.

Core No.15

Well: Yolla -1

Depth: 2945m (9662')

Rock Type: Claystone

Pull: 668 lbs

Recovered: 1.2cm (0.47")

Condition: Broken

Description:

Claystone: Macro med dk "chocolate" brn; micro med dk reddish-brn; mod hd and highly sub-fis as v/"shaley"; tr calc and v/poorly hydratable; abund micromica; rare silt to v/fn qtz grains; rare dissem blk microcarb.

Core No.16

Well: Yolla -1

Depth: 2885m (9465.1')

Rock Type: Claystone

Pull: 685 lbs

Recovered: 1.4cm (0.55")

Condition: Broken

Description:

Claystone: Macro dk "chocolate" brn; micro med dk "chocolate" brn; mod hd and dense, sub-fis w/blk frac and abund curved parting; mod homogeneous w/tr to abund dissem to aggregate micropyrite, rare to gd tr v/fn to cse silt and v/fn sd and gd tr micromica (musc); v/slight tr calc (dolomitic ?); v/slight try hydratable; vis frac por 5%.

Core No.17

Well: Yolla -1

Depth: 2879.5m (9447.1')

Rock Type: Sandstone

Pull: 816.5

Recovered: 1.4cm (0.55")

Condition: Solid

Description:

Sandstone: Macro alternating thin (1-10mm) beds of med gry (1-3mm) to med brn as "salt and pepper"; micro dom med gry and brn mottled w/lt to med gry w/dissem blk from microcarb and rare mafics (?); v/fn and mod well sort ang to v/minor sub-ang frsted w/v/minor clr qtz and minor feldsp in abund gry-wht to lt gry, non-calc kaolinitic (?) matrix; vis por 10-20%.

Core No.18

Well: Yolla -1

Depth: 2874m (9429.0')

Rock Type: Sandstone

Pull: 521.5

Recovered: 2.0cm (0.79")

Condition: Broken

Description:

Sandstone: Macro "salt and pepper" lt tan and med brn; micro mottled lt to med gry to gry-brn w/v/abund dissem blk microcarb; v/fn and mod well sorted, ang to minor sub-ang frsted to clr w/rare vitreous dom qtz w/minor feldsp in dom sparse to rare abund lt gry to gry-wht, non-calc kaolinitic (?) matrix; rare micromica (musc); vis por 20-30%.

Core No.19

Well: Yolla -1

Depth: 2845.5m.(9335.5')

Rock Type: Sandstone

Pull: 1620 lbs

Recovered: 3.0cm (1.18")

Condition: Solid to broken

Description:

Sandstone: Macro v/fn "salt and pepper" lt to med gry, variable tan and blk; micro gry-wht to lt gry, variably tan and brnsh-blk to blk as, respectively, highly kaolinitic (?) ss beds (0.4-1.2mm), tr to gd tr w/rare v/clayey ss beds (0.4-1mm) w/tr brnsh-blk microcarbonaceous, thin (0.2-0.4mm), and abund (15%) dissem blk to brnsh-blk mafics (?), the "cleaner" ss matrix as v/lt gry-wht, tr calc, highly hydratable (hygroclastic) bentonitic (?) and kaolinitic (?); vis por 15-25% w/v/fn to fn, mod poor sort, ang to variably minor sub-ang to sharp, frsted to clr w/gd tr vitreous qtz and feldsp; tr micromica (musc).

Core No.20

Well: Yolla -1

Depth: 2841.5m.(9322.4')

Rock Type: Sandstone

Pull: 876 lbs

Recovered: 2.2cm (0.87")

Condition: Broken to Shattered

Description:

Sandstone: Macro thin (1mm) bedded med gry and lt brn; micro med gry ss and gry-tan to lt gry-brn ss as microbedded (0.3-1.2mm) w/rare blk, microcarbonaceous beds (0.3mm); v/fn and mod well sort, ang, frsted to minor clr dom qtz and minor feldsp w/gd tr dissem blk microcarb and micromica and tr lt to med brn linear to lense-shaped, blended clayey ss inclusions; mod hd to mod soft and easily fri to fri w/mod pres; matrix lt to med gry, non-calc, highly hydratable (as hygroclastic), bentonitic (?) and kaolinitic (?); vis por 15-25%.

Core No.21

Well: Yolla -1

Depth: 2828.5m (9279.7')

Rock Type: Sandstone

Pull: 768 lbs

Recovered: 3.0cm (1.18")

Condition: Broken to shattered w/one solid segment (1.7cm or 0.67")

Description:

Sandstone: Macro variably grysh-tan w/thin (0.2-1mm) med brn bands (beds); micro dom gry-wht w/minor gry-tan mottled w/variably lt brn from clystn beds (0.2-1mm thick as 10% of specimen); v/fn, mod well sort ang, frsted to clr dom qtz w/minor feldsp in a gry-wht to gry-tan w/abund lt to med tan (residual oil stained?), mod calcitic and mod hydratable (w/hygroclastic disintegration of ss frags), bentonitic (?) and kaolinitic (?) matrix (20-40%); vis por 15-25%, mod soft and fri w/extr ease; clystn as the thin, non-calc, gd tr to abund blk to brnsh-blk microcarbonaceous, variably v/fn to cse silty and v/fn sdy interbeds; slight tr to tr dissem micromica (musc) in ss and clystn.

Core No.22

Well: Yolla -1

Depth: 2823.5m (9263.3')

Rock Type: Sandstone

Pull: 1323 lbs

Recovered: 2.4cm (0.94")

Sandstone: Macro mottled med lt gry-tan to lt tan; micro gry-wht to tan-wht mottled; v/fn-fn and mod poor sort, ang to sharp and rare sub-ang gry-frsted to clr w/v/minor brn-frsted to med brn dom qtz w/minor feldsp and gd tr blk mafics (?) and blk microcarb in a gry-wht, tan-wht to gry-tan, mod calcitic, bentonitic (?) and kaolinitic (?) matrix (20-25%); vis por 25-30%; v/soft and fri w/extr ease. (Note: cly matrix mod hydratable as hygroclastic.)

Core No.23

Well: Yolla -1

Depth: 2820m (9251.8')

Rock Type: Sandstone

Pull: 1043 lbs

Recovered: 2.0cm (0.79")

Condition:

Description:

Sandstone: Macro dom med brn w/lt to med tan mottling; micro dom med gry-wht w/abund gry-tan to lt brn mottling; v/fn to rare fn w/mod poor sort of ang to minor sub-ang, gry-to brn-frsted and clr w/rare vitreous dom qtz w/minor feldsp in med gry to gry-tan, non-calc, kaolinitic (?) matrix; tr dissem blk microcarb w/rare blk, vitrain-type serrated "seams"; rare to tr micromica (musc); vis por 20-30%.

Core No.24

Well: Yolla -1

Depth: 2813m (9228.9')

Rock Type: Sandstone

Pull: 787.5 lbs

Recovered: 2.3cm (0.91")

Condition: Broken

Description:

Sandstone: Macro tan and tan-wht mottled; micro tannish-wht, tannish-brn to lt brn mottled; v/fn-fn, very poor sort; dom frsted to clr w/v/minor brnsh-frsted to rare vitreous qtz and minor feldsp in a crmy-wht to tan-wht, non-calc kaolinitic (?) matrix, varying from gd tr to v/abund; gd tr dissem blk microcarb; rare micromica (musc) and dk red-brn, anhedral garnet (?); vis por 20-30%.

Core No.25

Well: Yolla -1

Depth: 2810m (9219')

Rock Type: Sandstone

Pull: 652 lbs

Recovered: 1.4cm (0.55")

Condition: Broken

Description:

Sandstone: Mega med gry-tan; micro lt gry w/v/minor lt brn mottling; v/fn and mod well sort; ang, frsted to clr dom qtz w/minor feldsp in mod abund gry-wht, non-calc, kaolinitic (?) matrix; mod soft and v/easily fri; gd tr to med abund dissem micromica (musc) and blk microcarb; vis por 20-25%.

Core No.26

Well: Yolla -1

Depth: 2763m (9064.8')

Rock Type: Sandstone

Pull: 274 lbs

Recovered: 0.4cm (0.16")

Condition: Extremely poor sample w/frags and mud

Description:

Sandstone: Micro gry-tan; v/fn-fn w/poor sort ang, frsted to clr dom qtz w/minor feldsp in med gry, non-calc kaolinitic (?) matrix; gd tr dissem and seamed blk microcarb; vis por indeterminate.

Core No.27

Well: Yolla -1

Depth: 2759.5m (9053.4')

Rock Type: Sandstone

Pull: 624.5 lbs

Recovered: 2.0cm (0.79")

Condition: Broken

Description:

Sandstone: Macro med gry-tan to lt brn mottled; micro variably med gry-wht to brnsh-tan mottled to "banded"; v/fn-v/minor fn w/mod gd sort of ang, frsted w/v/minor clr dom qtz and minor feldsp in lt to med gry to gry-tan, non-calc, kaolinitic (?) matrix; tr to gd tr dissem w/tr microbedded blk microcarb; rare micromica (musc); vis por 15-25%.

Core No.28

Well: Yolla -1

Depth: 2756m (9041.9')

Rock Type: Sandstone

Pull: 492.5 lbs

Recovered: 2.5cm (0.98")

Condition: Shattered

Description:

Sandstone: Macro med lt gry to gry-tan w/med brn to med dk brn interbeds; micro dom lt gry w/med dk brn clystn interbeds (0.6-2mm thick as 20% of specimen); v/fn and mod well sort, ang, frsted to clr qtz w/minor feldsp in a v/lt gry-wht to lt gry-tan and abund tan (residual oil stained ?), non-calc, kaolinitic (?) matrix (20-40%); vis por 15-20%; tr to gd tr dissem blk microcarb; extr hd to mod soft and fri w/high pres to fri w/low pres; clystn mod hd, sub-fis, non-calc, tr to abund blk to reddish-blk microcarb; ss and clystn w/tr to gd tr micromica (musc).

Core No.29

Well: Yolla -1

Depth: 2731m (8959.9')

Rock Type: Claystone

Pull: 464 lbs

Recovered: 2.5cm (0.98")

Condition: Broken

Description:

Claystone: Macro dk "chocolate" brn; micro uniformly dk reddish brn; mod hd, highly sub-fis w/abund contorted parting and abund frac partings of med brnsh-tan color; non-calc; v/abund dissem micromica (musc); tr vfn to cse silty and slight tr v/fn sdy; approx 5% vis frac por.

Core No.30

Well: Yolla -1

Depth: 2725.5m (8941.8')

Rock Type: Interbedded Sandstone and Claystone

Pull: 454 lbs

Recovered: 3.0cm (1.18")

Condition: Broken to Shattered

Description:

Interbedded Sandstone and Claystone: Macro gry-tan and dk brn bedded; micro gry-wht to lt tan ss beds (1-4mm thick) and dk brn to brnsh-blk clystn beds (0.5-5mm thick) w/both ss and clystn beds individually varying in thickness w/gd tr pinch-out forming open ended lense-types as appar crossbeds; ss v/fn to v/minor fn, ang to rare sub-ang to sharp, frsted to minor clr dom qtz w/minor feldsp in a lt to med gry-wht to gry-tan, slight tr calc, kaolinitic (?) matrix (20-30%); ss extr hd to mod soft and easily fri to v/minor fri w/mod pres (vis por 15-20%); ss w/gd tr dissem blk microcarb and rare micromica (musc); clystn mod hd, sub-fis, slight tr fis, v/abund to v/highly blk micromicaceous w/gd tr containing abund vintain-type coal "sheets", tr to v/abund v/fn-cse silty and v/fn sdy, rare micro-pyrite and micromica, tr hydratable.

Core No.31

Well: Yolla -1

Depth: 2720m (8923.8')

Rock Type: Sandstone

Pull: 582 lbs

Recovered: 2.2cm (0.87")

Condition: Shattered

Description:

Sandstone: Macro med tan and lt brn mottled; micro gry-wht, lt-med tan and lt to med brn mottled; v/fn to minor fn w/mod poor sort; ang w/abund sharp and gd tr sub-rnd, gry-wht frsted, brnsh-frsted and minor clr dom qtz w/minor feldsp in a gry-wht to med tan, tr calc, tr hydratable, kaolinitic (?) matrix (30%); vis por 25%; mod soft and v/easily fri; gd tr, variably med to med dk brn, blk microcarbonaceous, silty and v/fn sdy, non-calc, poorly hydratable clystn frags (5%); gen tr micromica (musc).

Core No.32

Well: Yolla -1

Depth: 2642.5m (8669.5')

Rock Type:

Pull: 1330 lbs

Recovered: No recovery, mud only

Condition:

Description:

Core No.33

Well: Yolla -1

Depth: 2636m (8648.2')

Rock Type: Mesocratic Igneous Rock (Andesitic ?)

Pull: 1118 lbs

Recovered: 3.2cm (1.26")

Condition: Solid w/tr rubble

Description:

Mesocratic Igneous Rock (Andesitic ?): Macro med dk grn w/abund tan-wht mottling; micro dom med grn w/mottling of blk, reddishbrn, gry-wht and clr as a porphyritic extrusive (?) w/cryptoxln to aphanitic groundmas; phenocrysts of sanidine (?) (vit), plagioclase (glassy to wht w/saussuritization (grnsh), biotite (hematitic ? as "rust" reddish-brn, hornblende (blk to reddish-brn, hematitic ?, augite (blk to grnsh-blk), brnsh hypersthene (?) and calcite (tan-wht, reactive) as dom subhedral w/approx equal anhedral w/decay; groundmas glassy w/tr to high devitrification as lithophysal, holohyaline to vitrophyric; rare vis por from appar calcite leaching.

Core No.34

Well: Yolla -1

Depth: 2630m (8628.5')

Rock Type: Claystone

Pull: 670.5 lbs

Recovered: 2.0cm (0.79")

Condition: 1.5cm (0.59") solid w/rubble

Description:

Claystone: Macro dk "chocolate" brn w/grysh-tan, thin (1-2 mm) "interbeds"; micro dk brn w/med gry-tan to med brn, v/fn ss lenses and interbeds; clystn mod hd and sub-fis; ss w/ang, frsted qtz and feldsp in lt gry-wht to gry-tan, non-calc, kaolinitic (?) matrix; all non-calc; vis ss por 10%

Core No.35

Well: Yolla -1

Depth: 1894m (6213.8')

Rock Type:

Pull: 372.5 lbs

Recovered: No recovery

Condition:

Description:

Core No.36

Well: Yolla -1

Depth: 1868M (6128.5')

Rock Type: Sandstone

Pull: 437.7 lbs

Recovered: 3.8cm (1.5")

Condition: Solid

Description:

Sandstone: Macro lt to med tan mottled w/one thin (1mm) v/dk brn "bed"; micro lt to med tan; mottled; v/fn to rare fn, mod poor sort, ang to sub-ang w/rare sub-rnd, gry-to minor brnsh-frsted and clr dom qtz w/minor feldsp in a med tan, non-calc kaolinitic (?) matrix; vis por 20-30%; dk brn clystn "bed" (1mm) highly blk microcarbonaceous, silty and poorly hydratable.

Core No.37

Well: Yolla -1

Depth: 1860m (6102.3')

Rock Type: Clayey Sandstone

Pull: 452.2 lbs

Recovered: 2.3cm (0.91")

Condition: Broken

Description:

Clayey Sandstone: Macro mottled med dk brn and med gry; micro lt to med gry ss mottled w/lt brn to med dk brn variably sdy clystn, all exchangeably as lenses, broken bed and frags w/rare slump features; ss v/fn and mod poor sort, dom frsted w/minor clr dom qtz w/minor feldsp in a lt gry to gry-tan, non-calc, kaolinitic matrix and vis por of 15-20%; clystn silty and v/fn sdy, non-calc, tr hydratable; ss/clystn = 60/40% to 50/50%; gen tr dissem micromica (musc) and blk micro-carb; all mod soft w/ss easily fri and clystn sub-fis.

Core No.38

Well: Yolla -1

Depth: 1855m (6085.9')

Rock Type: Clayey, calcareous sandstone

Pull: 267.5 lbs

Recovered: 1.4cm (0.55")

Condition: Broken

Description:

Clayey, Calcareous Sandstone: Macro variably lt tan to med brn mottled; micro med gry-tan to lt brn mottled ss w/abund med brn cly inclusions and gd tr to abund sub-parallel blk microcarb frags; v/fn and mod well sort, ang to abund sharp, frsted to minor clr qtz w/minor feldsp in an abund (20-40%), variably med gry-tan to med tan, mod calcitic, kaolinitic (?) matrix; vis por 15-20%; incl cly "frags" variably silty and v/fn sdy, tr blk microcarbonaceous and poorly sol; gen dissem micromica (musc) in ss and clystn.

Core No.39

Well: Yolla -1

Depth: 1850m (6069.5')

Rock Type: Sandstone

Pull: 174.8 lbs

Recovered: 3.0cm (1.18")

Condition: Broken

Description:

Sandstone: Macro v/even med brn; micro mottled lt to med brnsh-tan; v/fn, ang, frsted w/minor clr dom qtz and minor feldsp in a med tan, non-calc, kaolinitic (?) matrix (20%); even vis por 25%; tr to gd tr blk dissem microcarb w/tr as incl in clyey "frags"; tr micromica (musc); v/soft and totally fri w/extr ease.

Core No.40

Well: Yolla -1

Depth: 1845m (6053.1')

Rock Type: Sandstone

Pull: 163.6 lbs

Recovered: 2.6cm (1.02")

Condition: Broken

Description:

Sandstone: Macro variably med tan to med brn w/med dk brn beds (5%); micro mottled med gry, gry-tan, lt to med brn as variably clyey ss w/thin (3mm), dk brn, silty and v/fn sdy clystn interbeds (5%); all non-calc; ss v/fn w/mod gd sort, ang, frsted to clr qtz and feldsp in gry-tan to brnsh-tan, kaolinitic (?) matrix (20-30%) w/vis por 15-25%; ss w/rare to tr dissem blk microcarb and rare micromica (musc); ss mod to v/soft and fri w/low pres; clystn mod hd, mod sub-fis, tr micromicaceous (musc) and poorly hydratable; clystn frac por less than 5%.

Core No.41

Well: Yolla -1

Depth: 1840m (6036.7')

Rock Type: Sandstone

Pull: 253.3 lbs

Recovered: 3.1cm (1.22")

Condition: Broken

Description:

Sandstone: Macro mottled lt to med brnsh-tan; micro med tan w/mod abund med dk brn to brnsh-blk, highly microcarbonaceous, non-calc, discontinuous, rare foliated, thin (0.1-0.6mm) clay "layers" and frags, rarely as discontinuous bedding; v/fn, mod well sorted, ang to abund subhedral and gd tr sub-ang dom frsted to minor clr qtz and feldsp in a 20-30% med tan, resinous, non-calc, kaolinitic matrix; vis por 20-30%; tr micromica; rare dissem micropyrite.

Core No.42

Well: Yolla -1

Depth: 1835m (6020.3')

Rock Type: Sandstone

Pull: 317.2 lbs

Recovered: 2.9cm (1.14")

Condition: Broken w/one segment of 2.4cm (0.94")

Description:

Sandstone: Macro variably med lt tan to med brnsh-tan w/abund dk brn fn, curved appar bedding; micro lt to med gry-tan "clean" ss w/abund curved to curved and convergent, med to dk brn v/clayey ss to silty and v/fn sdy clystn as thin (0.1-0.3mm) beds, beds forming up to 10% lense-type ss increments; v/fn, mod well sort, ang, frsted to minor clr qtz w/minor feldsp in a 20% to 30%, variably gry-tan, non-calc, mod hydratable, bentonitic (?) and kaolinitic (?) matrix; tr dissem blk to brnsh-blk microcarb, blk mafics (?) and micromica (musc); v/soft and fri w/extreme ease; vis por 20-30%.

Core No.43

Well: Yolla -1

Depth: 1830m (6003.8')

Rock Type: Sandstone w/Claystone beds

Pull: 218.5 lbs

Recovered: 3.0cm (1.18")

Condition:

Description:

Sandstone: Macro tan (ss) w/abund med brn beds (clystn); micro ss lt to med grysh-tan, lt to med tan to lt to med gry and clystn med brn; ss vfn, mod well sort w/ang, frsted qtz and minor feldsp in gry-tan, non-calc, kaolinitic (?) matrix w/tr blk microcarb; clystn dom mod silty and v/fn sdy w/gd tr dissem blk microcarb, non-calc and poorly hydratable; vis frac por 5%, vis ss intergranular por to 25% in less clayey portions.

Core No.44

Well: Yolla -1

Depth: 1825m (5987.5')

Rock Type: Clayey Sandstone

Pull: 1046 lbs

Recovered: 2.8cm (1.1")

Condition: Broken

Description:

Clayey Sandstone: Macro mottled med to dk brn and lt to med tan; micro a mosaic of variably gry-tan and med to dk brn as a highly turbid mixture of 30-50% sd and 70-50% claystn w/minimal thin (0.3-1mm) bedding and abund pseudobedding and turbidity features; ss v/fn, mod well sort, ang, frsted to minor clr and gd tr brnsh-frsted qtz and minor feldsp in a gry-tan to tan, non-calc, kaolinitic (?) and tr bentonitic (?) matrix; ss vis por 10-20%; ss mod soft and easily fri; clystn non-calc, mod hydratable (hygrotergid), variably silty and v/fn sd y w/tr micromica (musc).

Core No.45

Well: Yolla -1

Depth: 1820m (5971.1')

Rock Type: Sandy, Pyritic Claystone

Pull: 288.5 lbs

Recovered: 3.5cm (1.38")

Condition: Broken

Description:

Sandy, Pyritic Claystone: Macro med dk brn and tan w/lineated mottling; micro variably med dk brn w/extr abund beds and "lenses" of med gry to med lt gry-brn, mod clyey, v/fn, mod well sorted ss w/ang, frsted to clr qtz and feldsp in a tan-wht, kaolinitic (?) matrix; the beds variably "broken", parted and w/slump features; all non-calc; tr to v/gd tr dissem and fragment-form micropyrte, rare forms w/lattice-type structures; all mod hd w/clystn highly sub-fis, "shaley" and ss as fri w/med pres; clystn w/variably abund incl silt to v/fn qtz and feldsp grains; clystn w/5% vis frac por and ss w/vis intergranular por absent.

Core No.46

Well: Yolla -1

Depth: 1815m (5954.6')

Rock Type: Clyey Sandstone

Pull: 1293 lbs

Recovered: 3.0 (1.18")

Condition: Broken

Description:

Clayey Sandstone: Macro lineated mottling of variably med to dk tan and med dk brn; micro 60-70% variably tan ss and 40-30% med dk brn clystn as appar turbidity deposits w/abund lenses, crossbeds, frags and w/abund micro-slump; ss v/fn, mod poor sort, ang to sub-ang to sub-rnd and rare sharp, gry-to brn-frsted, variably brn and clr qtz w/minor feldsp in a variably tan, non-calc, tr hydratable, kaolinitic (?) to tr bentonitic (?) matrix (20-40%); ss vis por 10-20%; ss mod hd and fri w/mod pres; clystn mod hd, sub-fis as fn beds, lenses and linear "frags" (0.2-3mm), non-calc, mod hydratable (hygrofissile), gd tr blk to brnsh-blk microcarbonaceous and tr micromicaceous (musc), variably silty and v/fn sd y.

Core No.47

Well: Yolla -1

Depth: 1810m (5938.2')

Rock Type: Sandy, Pyritic Claystone

Pull: 432.2 lbs

Recovered: 3.5cm (1.34")

Condition: Broken w/one 2.5cm (0.98") segment

Description:

Sandy, Pyritic Claystone: Macro v/dk brn w/med tan, lineated mottling; micro med dk brn clystn w/v/abund lense-type and fragment to pseudo-bed, v/fn, mod well sort, frsted to clr qtz and feldsp; ss w/tan wht kaolinitic matrix; all non-calc; gd tr to abund dissem to fragmental micropyrite; clystn v/hd and highly sub-fis w/ss mod hd and fri w/mod pres; vis por absent.

Core No.48

Well: Yolla -1

Depth: 1805m (5921.8')

Rock Type: Sandy, Pyritic Claystone

Pull: 275.7 lbs

Recovered: 3.3cm (1.3")

Condition: Broken

Description:

Sandy, Pyritic Claystone: Macro v/dk brn w/med to dk tan, lineated mottling; micro v/dk brn v/fn-cse silty and v/fn sdy clystn w/abund "lineated debris" ss as frags, lenses and rare pseudo-beds w/rare slump-like features; ss mod poor sort frsted to clr, ang qtz and feldsp in a lt tan, kaolinitic (?) matrix; tr to locally abund aggregate w/rare dissem micropyrite; all non-calc; clystn v/hd and mod sub-fis; ss mod hd and fri w/mod pres; vis por 5% in ss.

Core No.49

Well: Yolla -1

Depth: 1795m (5889')

Rock Type: Claystone

Pull: 324 lbs

Recovered: 3.6cm (1.42")

Condition: Three solid pieces

Description:

Claystone: Macro uniformly v/dk brn; micro v/dk brn w/gd tr "brass" color from incl micropyrite aggregates; mod hd and dense w/irreg frac, tr splintery; dom sub-fis, "shaley"; non-calc and gd tr hydratable (hygrofissile); rare to gd tr silt and v/fn sd (dissem); rare to tr micromica (musc ?); micropyrite as irreg, lineated to lense-type inclusions.

Core No.50

Well: Yolla -1

Depth: 1785m (5856.2')

Rock Type: Claystone

Pull: 193.8 lbs

Recovered: 4.2cm (1.65")

Condition: Solid segment of 3cm (1.18") remainder broken

Description:

Claystone: Macro dk brn; micro med dk reddish-brn w/abund multiform "brassy" micro-pyrite inclusions (ellipsoidal, "V-shaped", lineated, globular); mod hd and mod dense w/dom conchoidal frac; sub-fis; non-calc and mod hydratable (hygroclastic); tr micromica (musc ?); rare to tr silty and v/fn sdy.

Core No.51

Well: Yolla -1

Depth: 1765m (5790.6')

Rock Type: Claystone

Pull: 150.8 lbs

Recovered: 4.4cm (1.73")

Condition: Broken w/one segment of 2.5cm (0.98")

Description:

Claystone: Macro med dk "chocolate" brn; micro med dk brn w/v/abund aggregates of micropyrite and gd tr disseminated micropyrite of "brass" color and gd tr to abund wht to gry-wht cly and clyey, v/fn ss frags and "micro-lenses"; v/hd and dense as sub-fis w/conchoid fracture; tr disseminated micromica (musc); vis por absent; non-calc and tr hydratable (hygrofissile).

CORE DESCRIPTIONS

CORE #1

CORE #2

YOLLA-1

INTRODUCTION

Two conventional cores were cut in Yolla-1. Core No.1 was cut in the uppermost part of the EVCN to investigate hydrocarbon shows seen in cuttings. Although a fibreglass-lined core barrel was utilised, the recovery was very poor and it was decided to abandon further coring and drill ahead.

Core No.2 was programmed to cut several metres of basalt, principally for lithological and geochronological identification. Unfortunately the basalt recovered proved to be too altered mineralogically for confident age dating by isotopic or fission track techniques. (See Petrology and Geochronology sections.)



Amoco Australia Petroleum Company

WELL: YOLLA No.1

CORE No.: 1

SHEET 1 of 1

CORED: 1838 - 1848 = 10 m

RECOVERED: 2.8m, 27.3% SCALE: 1:40

FM: EASTERN VIEW COAL MEASURES

DESCRIBED: GMK

DATE: 25/11/85

CORE RATE meters per hour 40 20 0	GRAINSIZE					DEPTH METRES (RT)	LITHOLOGY	HYDROCARBONS	CORE ANALYSIS				
	CLAY	S&G	F	M	V				POB.	AIR PERM. (md)	RES. FLUIDS (%)		
									%	Kh	Kv	Sw	Sv
							FINAL SLABBED CORE DESCRIPTION TOP OF CUT CORE 1838m						
						1838							
						1839							
						1840							
						1841	Interval consists of dom vf gr <u>Sst</u> & thin <u>Clst</u> laminae & clasts. In general no lamination or bedding visible. <u>Sst</u> - Lt brn gy, superfine - vf gr, sa-sr, v.w. srt'd, tr brn cly mtx grd'g to <u>Clayey Sst</u> in pt, tr mica, v. fri, exc vis por (~30%).						
						1842	<u>Clayey Sst</u> - Dk gy brn, vf gr, sa-sr, prly srt, 15-20% brn cly mtx, v. mica, tr carb, fri, pr vis s (~10%) <u>Clst</u> - Dk gy brn, sdy in pt, v. mica, v. sft.						
						1843	ENVIRONMENT OF DEPOSITION Probable upper shoreface to lower beach.						
						1844							
						1845	TOP OF RECOVERED CORE No.1 1845.25m (6054')						
						1846	RUBBLE 1846.2m - 1847.1m SOLID CORE Vertical burrow 2cm long at 1846.5m Contorted <u>Clayey Sst</u> at 1846.6m	1845.25 - 1845.5 Non-uniformly distributed dull-med bri bl wh fluor in rubble.	29.6 25.2 25.8	75 17 11		12.5 11.1 4.3	84.8 81.3 90.6
						1847	Small burrows throughout solid core both horizontal and vertical typically 2-4mm dia. & 1-2cms long Probable wave oscillation ripple at 1846.8m RUBBLE	Elsewhere core is flushed/or is water-wet. Note : Wellsite observations were : even lt brn oil stain with even med gold yel fluor.	30.4 30.0 29.2 30.0 30.9	65 51 37 42 204		5.6 5.0 3.7 4.6 4.2	88.3 88.5 90.5 86.2 79.9
						1848	BASE OF RECOVERED CORE No.1 1848m (6063')		28.6	**		3.5	79.8
													* Summation of fluids porosity ** Broken core

* Summation of fluids porosity
** Broken core

NOTE: Core recovered at base of fibreglass liner.



Amoco Australia Petroleum Company

WELL YOLLA No.1

CORE No. 2

SHEET 1 of 1

CORED 3344.7 - 3346.8 m = 2.1m

RECOVERED 1.4m, 64 %

SCALE 1:40

FM EASTERN VIEW COAL MEASURES

DESCRIBED GMK

DATE 21/8/85

CORE RATE METRES 4 2	GRAINSIZE						DEPTH METRES (RTI)	LITHOLOGY	HYDROCARBONS	CORE ANALYSIS				
	CLAY	SILT	FINE SAND	MEDIUM SAND	COARSE SAND	GRAVEL				POR.	AIR PERM. (md)	RES. FLUIDS (%)		
										%	Kh	Kv	Sw	Su
								FINAL SLABBED CORE DESCRIPTION						
							3344	TOP OF CUT CORE 3344.7m						
							3345	WHOLLY AMYGDALOIDAL BASALT	NIL	NO CORE ANALYSES PERFORMED				
							3346	BASE OF RECOVERED CORE 3346.1m						
							3347	BASE OF CUT CORE 3346.8m						
								LITHOLOGY : Severely altered amygdaloidal basalt - pl ol to ol gy, common frags & veins, occ open but usually filled, amygdales upto 2cm dia, occ flattened by flowage, occ unfilled, rock firm to hard where relatively fresher. Compositionally: relict for intergranular texture consisting of altered feldspar laths with surrounding groundmass of altered mafics (probably consisting of original pyroxene(s) & olivine(?)), iron oxides & sulphides.						

DIPMETER SUMMARY

for

YOLLA-1

STRUCTURAL DIP

The high resolution dipmeter tool (HDT) was run over the interval 3354-1755 m in Yolla-1, and was processed using the CLUSTER program with a 1.0 x 0.5 m correlation interval and step distance, respectively, and a 35 degree search angle.

A listing of the interpreted structural dips is presented below, with only confident data tabulated. Some shale-prone intervals did not have good dip data, which may be due to disruption of the fine bedding laminations caused by post-depositional effects such as bioturbation or slumping. Discrete packages of dip orientations throughout the well (directions and magnitudes) are plotted on the Composite Log (enclosure 3).

Structural Dips

Depth Interval (mKB)	Magnitude (degrees)	Azimuth
2067-2072	2	NNW
2322-2325	2	WSW
2405-2411	2	SW
2505-2518	1	W
2531-2537	1	E
2558-2560	1	E
2688-2693	2	NE
2710-2718	3	NW
2742-2755	3	N
2767-2771	3	NW
2875-2878	2	SW
2895-2950	1	W
2964-2972	1	W

The structural dips have a low magnitude and azimuth which is in general agreement with the structural interpretation of Yolla. No major faulting or folding is evident on the cluster.

LOG ANALYSIS
OF
YOLLA -1

SUMMARY

A significant accumulation of hydrocarbons was found in Yolla-1. Total net pay in this well is 58 m.

The average porosity of the top zone (1805-1846 m) is 26% and the average water saturation is 51%. A hydrocarbon water contact is interpreted at 1846 m.

The average porosity of the bottom zone (2718-2995 m) is 19% and the average water saturation is 30%. A hydrocarbon water contact is not interpreted.

The results of the analysis along with the pertinent input log data are shown in Table 2.

DISCUSSION

Yolla-1 wireline logs were analysed for porosity, water saturation and fluid content. Well logs available for interpretation were from Suite #3 and include the following:

- Induction Spherically/Focused Micro Spherically Focused/
Gamma Ray/Sonic
- Litho Density/Compensated Neutron/Gamma Ray
- High Resolution Dipmeter
- Repeat Formation Tester

The quality of the data was basically good except for borehole effects in washed-out areas of the well. Where the reservoir quality rock is in gauge the log data is valid.

There were problems with the Sonic, Dipmeter and Repeat Formation Tester. All problems associated with these tools were corrected either before the job was completed or during subsequent post-processing.

Log information obtained from the ISF-BHC-MSFL-GR-SP-CAL log heading applicable to the log analysis is:

Depth logger	3351 m
Resistivity of the filtrate	.838 ohm meters at 16 Deg. C.
Bottom hole temperature	121 Deg. C.

TECHNIQUE

The dual water method of analyzing shaly formations was used in processing these data. The basic Archie water saturation equation was modified to take into account the varying amounts of shale. The water saturation equation used in the interpretation is:

$$S_w = (R_{mix}/(R_t * \Phi^{**M}))^{**0.5}$$

$$R_{mix} = R_{wb} * R_{wf} / (V_{sh}(R_{wf} - R_{wb}) + R_{wb})$$

S_w = water saturation

R_{mix} = resistivity of the formation water (a function of free and bound water resistivities)

Rwf = free water resistivity = .053 ohm meters at 149 Deg. F. above 2700 m
 Rwf = free water resistivity = .067 ohm meters at 197 Deg. F. below 2700 m
 Rwb = bound water resistivity = .600 ohm meters at 149 Deg. F.
 Rt = true resistivity
 Phi = total porosity
 M = $1.87 + .019/\text{Phi}$

SHALE PARAMETERS

Shale parameters used for calculations in Zones A and B are shown in Table 1.

Table 1 - Yolla-1
Shale Parameters

Depth (m)	Zone	Rhob	Neut	Sonic	Rt	GRSH	GRCL
2065	A	2.45	0.30	90	6	50	10
2900	B	2.70	0.32	78	6	50	10

DEFINITION OF TERMS

RHOB = Bulk Density
 NEUT = Porosity of Neutron limestone matrix
 SONIC = Interval Transit Time
 RT = True Resistivity
 GRSH = Gamma Ray Shale
 GRCL = Gamma Ray Clean

RWB (Resistivity of the bound water) is calculated from the shale resistivity and the total porosity derived from the shale neutron and density values.

The bulk volume shale (VSH) is equal to the minimum amount calculated from all the shale indicators used.

$$\text{VSH} = \text{Minimum of VSHND, VSHSD, VSHGR}$$

Vsh = Bulk Volume shale
 Vshnd = Bulk Volume shale from the Neutron Density crossplot
 Vshsd = Bulk Volume shale from the Sonic Density crossplot
 Vshgr = Bulk Volume shale from the Gamma Ray

The neutron is in limestone porosity units. The total porosity was derived from the crossplot of the neutron versus density. All porosities listed in the results summary are corrected for shale volume and are effective porosities. The interpretation assumes complex lithology plus shale.

LOG ANALYSIS

Table 2 - Yolla-1
Results Summary

	Depth	PHIE	Sw	Vsh	RwF	Neut	Rhob	Sonic	Rt	GRS
Z	1819.0	.17	.63	.29	.052	.26	2.35	96	2.8	51
O	1833.0	.30	.40	.16	.052	.36	2.10	115	2.6	43
N	1840.0	.21	.69	.31	.052	.32	2.25	103	1.5	52
E	1843.0	.24	.77	.22	.052	.32	2.20	104	1.0	48
	1846.0	.23	.92	.28	.052	.34	2.20	110	.7	52
A	1868.5	.26	1.00	.05	.051	.27	2.23	110	.6	25
	2725.0	.15	.54	.19	.067	.20	2.40	85	7.0	18
	2759.0	.16	.29	.17	.066	.20	2.38	90	21.0	20
	2760.5	.20	.25	.00	.066	.17	2.32	95	22.0	22
	2762.5	.17	.21	.00	.066	.14	2.37	78	52.0	20
Z	2810.0	.20	.28	.10	.066	.24	2.35	84	16.0	14
O	2820.5	.18	.15	.00	.065	.11	2.30	86	90.0	10
N	2845.5	.15	.63	.07	.065	.15	2.40	80	6.0	16
E	2874.0	.17	.46	.05	.065	.17	2.40	87	10.0	12
	2952.5	.15	.35	.19	.063	.19	2.41	82	17.0	19
B	2974.5	.15	.27	.02	.063	.13	2.40	84	35.0	13
	2988.0	.20	.18	.00	.063	.14	2.27	89	50.0	13
	2990.0	.17	.30	.10	.063	.18	2.37	86	20.0	17
	2991.5	.20	.19	.00	.063	.15	2.30	90	45.0	13
	3012.5	.14	.46	.08	.062	.14	2.42	90	13.0	15

DEFINITION OF TERMS

PHIE = Effective Porosity
GRS = Spectral Gamma Ray

RFT RESULTS

Valid data acquired from the five Repeat Formation Tester runs is listed in Table 3.

Table 3 - Yolla-1
RFT Pressures

Depth (mKB)	Formation Pressure (Init. Shut-in, psi)	Depth (mKB)	Formation Pressure (Init. Shut-in, psi)
1818.0	Run 1 2731	2820.5	4573
1833.0	2737	2823.5	4571
1832.5	2707	2845.5	4140
1839.0	2716	2725.0	Run 2 4070
1843.0	2724	2760.5	4099
1846.5	2724	2763.3	4108
1856.0	2738	2811.0	4137
1868.0	2748	2820.0	4107
1905.0	2821	2821.0	4131
1921.0	2835	2823.5	4129
1946.0	2873	2845.5	4114
2034.0	3004	1845.0	Run 4 2725.7
2125.0	3145	1832.7	2710.1
2215.0	3284	1830.0	2712
2327.0	3400	1833.0	2709.3
2828.0	3541	1837.0	2712.8
2725.0	4073	1845.0	2722.4
2756.0	4120	2724.0	Run 5 4125
2760.0	4108	2761.3	4156
2763.3	4105	2820.0	4170.5
2811.0	4153	2874.0	4238
2813.0	4147	2952.5	4382.4
2819.0	4570	2973.5	4387.2
2820.0	4576	2988.0*	4392

* Sample taken containing: 47.7 ft³ gas
Approx. 1500cc water
Approx. 100cc condensate (white only fluid).

DRILLSTEM TEST SUMMARY
for
YOLLA-1

INTRODUCTION

Drillstem tests in Yolla-1 were conducted over two zones within the Eastern View Coal Measures (EVCN). The first zone tested was a late Paleocene sandstone. Perforations were from 2809.1 m to 2814.2 m and from 2817.9 m to 2824.6 m (DST #1). The second zone tested was a middle to late Eocene sandstone occurring near the top of the EVCN. Initially, it was perforated from 1830 m to 1835.2 m (DST #2) but, because of water recovery, communication behind pipe was suspected and the perforations were squeezed with cement. After the cement squeeze, the interval from 1833.2 m to 1833.8 m was perforated (DST #2A). Following this, the interval from 1813 m to 1833.1 m was perforated (DST #3). Testing proceeded from September 10 to October 5, 1985.

Objectives of the drillstem tests in Yolla-1 were as follows:

1. To determine initial reservoir pressure.
2. To determine reservoir parameters such as permeability and skin factor.
3. To obtain representative reservoir fluid samples (oil, condensate and water).
4. To determine well productivity.

Fluid samples from each drillstem test were taken and sent to core laboratories for composition and properties analyses. This work has not been completed at this time. A complete and detailed Drillstem Test Report for Yolla-1 is being compiled and will be available when analyses have been completed. Below is a brief summary of the drillstem tests conducted in Yolla-1.

Drillstem Test Data Summary

The late Paleocene sandstone has a calculated initial reservoir pressure of 4203 psi. The Kh of the reservoir calculated from the build up test is 7093 md-ft ($K = 308.4$ md, $h = 23$ ft), and the skin factor is 13.5. Absolute Open Flow (AOF) of the zone is 358817 MCFD.

The middle to late Eocene sandstone has a calculated initial reservoir pressure of 2710 psi. The Kh of the reservoir calculated from the build up test is 242.1 md-ft ($K = 16.14$ md, $h = 15$ ft), and the skin factor is 0.536. Absolute Open Flow of the zone is 13083 MCFD.

Table 1 provides a summary of the drillstem tests.

TABLE 1
YOLLA-1 - DST SUMMARY

DST #	AVG FLOW			AVG FTP (PSIG)	AVG FBHP (PSIG)	SIBHP (PSIG)	SG	API GRAV	COMMENTS
	MMCFD	BOPD	BWPD						
1 (FLOW #1) 2809.1-2814.2 m 2817.9-2824.6 m	10.2	420	TSTM	2716	4106	4197	.86	50.5	24285 GOR (41.2 BBLS/MMCF), CONDENSATE YELLOW, 8-16% CO ₂ , 30/64" CHOKE.
1 (FLOW #2) 2809.1-2814.2 m 2817.9-2874.6 m	15.1	580	TSTM	2533	4038	4197	.86	51.2	26034 GOR (38.4 BBLS/MMCF), 10- 25% CO ₂ , CONDENSATE YELLOW, 40/ 64" CHOKE
2 (FLOW #1) 1830-1835.2 m	3.4	TSTM	N.A.	957	2086	2690	-	-	MAKING TOO MUCH WATER ON 46/64" CHOKE, COULD NOT GET AN OIL LEVEL - CHOKE BACK
2 (FLOW #2) 1830-1835.2 m	2.2	TSTM	1675	1198	2412	2690	.81	48-43.7	COULD NOT CHOKE BACK WATER ON A 32/64" CHOKE, CONDENSATE WAS A THIN LIGHT CRUDE COLOR LIQUID THAT TURNED TO WAX AT 60°F
2-A 1833.2-1833.8 m	1.02	302	TSTM	1170	1984	2690	.87	45.5	16/64" CHOKE, 3376 GOR (296 BBLS/MMCF), OIL WAS CARAMEL IN COLOR LIQUID THAT TURNED TO WAX AT 60°F
3 1813-1833.1 m	11.8	892	0	950	1444	2690	.79	50.6	80/64" CHOKE, GOR 13229 (76 BBLS/MMCF), OIL WAS DARK BROWN IN COLOR, DID NOT WAX UP.

THE FORAMINIFERA SEQUENCE

in

YOLLA-1

Part I (200-1750m)

Part II (2228-2747m)
Eastern View Coal Measures

Modified from reports
by Dr David Taylor

SUMMARY

Paleontological analyses were conducted on Yolla-1 samples from 200 m to 1750 m to define the foraminiferal zones in the Torquay Group, Angahook Formation and the Demons Bluff Formation. Following this work, a second set of samples (2228-2747 m), within the Eastern View Coal Measures, was analysed to help define possible marine incursions as indicated by palynological analyses. Paleontological analyses defined the uphole section of the well (Torquay Group, Angahook Formation, Demons Bluff Formation) as Middle Miocene and younger to Late Eocene in age with a 5 to 10 million year hiatus occurring in the Angahook Formation at 1440 m. No strongly marine incursions were defined within the Eastern View Coal Measures although one is inferred, based on palynology, between 2408 m and 2417 m.

PART I (200-1750 m)

INTRODUCTION

Eighteen intervals of ditch cutting samples were examined between 200 m and 1750 m from Yolla-1. Sample spacing was at 100 m intervals, apart from around 700 m and between 1700 and 1750 m. Downhole contamination was minimal and obvious where present.

A summary of the Yolla-1 sequence is given as Table 1; while data on the distribution of planktonic and benthonic foraminifera, other fauna and sediment grain analysis are presented as Tables 2 and 3. Biostratigraphic reliability is shown on Table 4.

PART II (2228-2747 m)

INTRODUCTION

Twenty-one samples from within the Eastern View Coal Measures sequence (EVCN) were processed and examined, as listed with the data chart of Table 5. These samples were selected based on reports of dinoflagellates from palynological analyses. Nine of the samples were barren of foraminifera, whilst the other twelve contained only morphologically simple, arenaceous foraminifera. Only one strongly marine incursive event was recorded in the EVCN from 2408 m to 2417 m. Palynological analysis revealed 15% dinoflagellates in this sample, and suggests an upper M. diversus marine incursion of normal magnitude as seen elsewhere in the Bass Basin. Unfortunately, the sample was consumed for palynological analysis and was not verified by paleontological work.

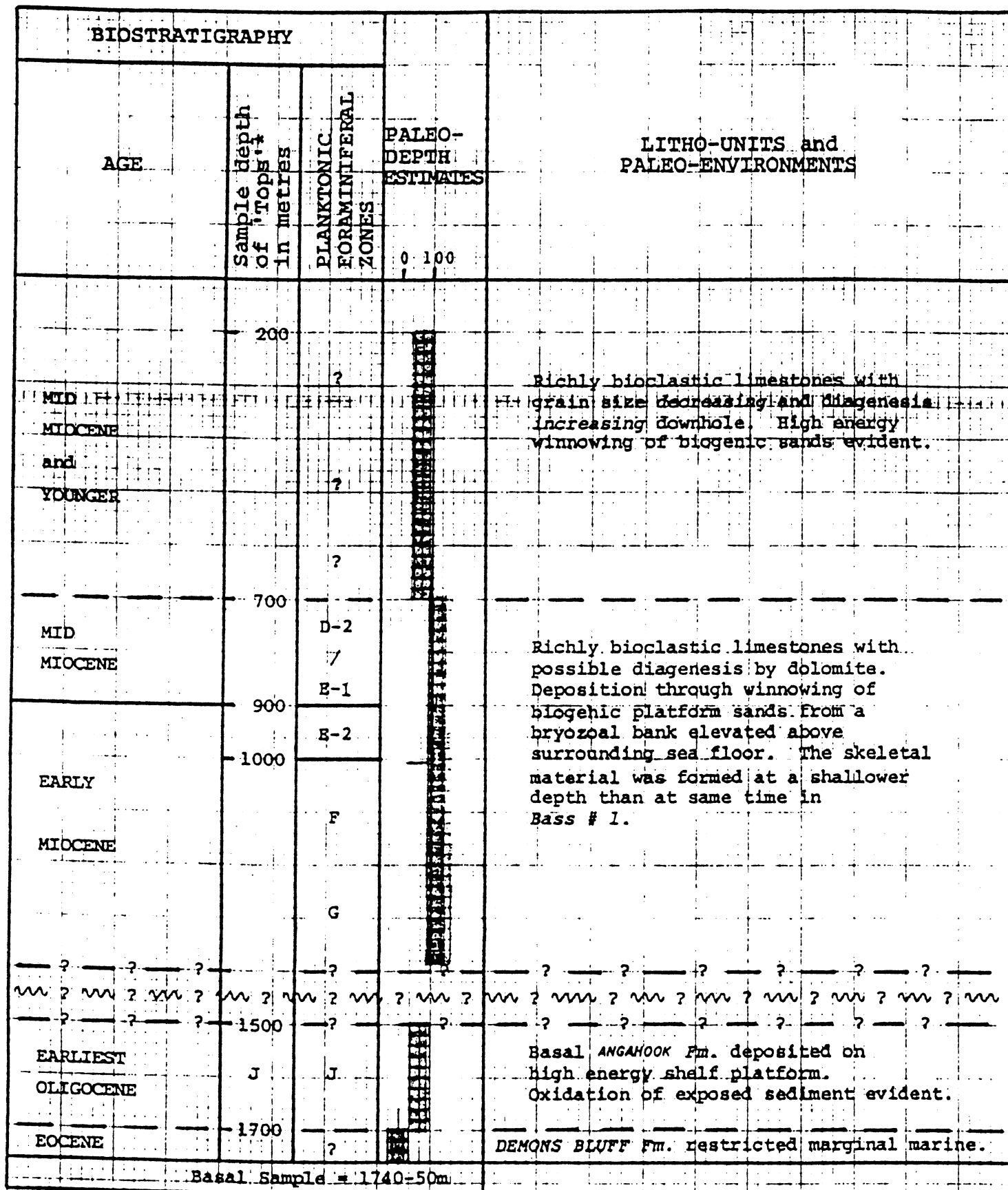


TABLE 1: INTERPRETED FORAMINIFERAL SEQUENCE - YOLLA # 1 - BASS BASIN.
(Refer factual data Tables 2 & 3).

* only ditch cutting samples available

— ? — ? —

~ ~ ~ ? ~ ~ ~ probable hiatus

— ? — ? — within poorly sampled interval

DITCH CUTTING SAMPLE INTERVALS in metres	PLANKTONIC FORAMINIFERA ACTUAL DISTRIBUTION	PLANKTONIC FORAMINIFERA INFERRED RANGES	BENTHONIC FORAMINIFERA RANGES See Table 3	AGE	PLANK. FORAM ZONE	ZONE TOP DEPTH IN METRES
	G'ina bulloides Orb. universa G'ina woodi woodi G'ina & G'alia indet (<.2mm) G'quad dehiscens (S.S.) G'ooides trilobus (S.S.) Orb. suturalis G'ooides bisphericus Praeorb. glomerosa G. trilobus (elongate) G'ina woodi connecta G'alia praescitula G'alia praemenardii G'quad advena Cat. dissimilis G'alia siakensis/mayeri G'alia continuosa G'alia zealandica (S.S.) G'ina angiporoides (S.S.) G'ina & linaperta G'ina angiporoides (S.S.) Praeorb. glomerosa G'ooides trilobus (elongate) G'ina woodi connecta Cat. dissimilis Orb. suturalis G'ooides bisphericus G'ooides trilobus (S.S.) Orb. universa Demons Bluff Arenaceous Assemblage Anghook Arenaceous Assemblage Torquay Group Calcareous Assemblage Shallow Bass Strait Assemblage	G'ina angiporoides (S.S.) Praeorb. glomerosa G'ooides trilobus (elongate) G'ina woodi connecta Cat. dissimilis Orb. suturalis G'ooides bisphericus G'ooides trilobus (S.S.) Orb. universa Demons Bluff Arenaceous Assemblage Anghook Arenaceous Assemblage Torquay Group Calcareous Assemblage Shallow Bass Strait Assemblage				
200- 10+	No planktonics			MID MIOCENE or YOUNGER	?	700
295-305+	°					
395-405+	°					
495-505+	° ° ° °			MID MIOCENE	D-2/E-1	900
595-605+	° ° ° ° D					
695-705+	° ° ° ° D °					
700- 10+	° x ° ° ° °			EARLY MIOCENE	E-2 F/G	1500
800- 10+	x ° x ° ° °					
900- 10+	x ° x ° ° ° ° °					
1000- 10+	° ° ° ° ° ° ° °			EARLY OLIGOCENE	J ?	1700
1100- 10+	° ° x ° ° ° ° °					
1200- 10+	° ° ° ° ° ° ° °					
1300- 10+	x x ° ° ° ° ° °					
1400- 10+	x ° x D ° ° ° °					
1500 10+	°					
1600 10+	x ?					
1700 10+	No planktonics					
1740 50+	No planktonics					

TABLE 2 - BIOSTRATIGRAPHIC DATA - YOLLA #1 - BASS BASIN.

Symbols

° = 1-20 specimens

x = >20 specimens

D = Dominant 60% of specimens

Documented
range for
Bass Strait Basins

Actual range with
apparent down-
hole contamination

David Taylor,
August 22, 1985.

DITCH CUTTING SAMPLE INTERVALS in metres	ARENACEOUS FORAMINIFERA	CALCAREOUS BENTHONIC FORAMINIFERA	STATISTICS			OTHER FAUNA	RESIDUE GRAINS
	Textularia spp. Ammonospheroidina sp. Gaudyrina convexa G. keywoodensis Pseudoclavulina rudis Haevslerella spp. Haplophragmoides spp. (coarse grained) Bathysiphon angleseanensis Haplophragmoides spp. (fine grained)	Elphidium imperatrix E. crispum- & advenum- Notorotalia spp. Discorotalia aranea Cibicides opacus C. lobatulus C. molestus C. mediocris C. vortex C. thiana C. perforatus C. brevoralis Hetrolepa victoriensis Karreria maoria Anomalina procolligera A. macroglabra Astronion spp. Alabamina sp. Eponides repandus Gyroidinoides spp. Cassidulina subglobosa Sphearoidina bulloides Siphonina australis nodosarids miliolids	Foram count	% planktonic forams	% arenaceous forams	Bryozoal fragments Echinoid fragments Molluscan fragments ostracodes gastropods sponge spicules pyrite tubes & discs	Bioclastic limestones ang. quartz Grey colouration of fauna Dolomitic cement Pellet glauconite Calc. grain stone (? dolomitic) Calcareous siltst. limonite after pyrite pyrite calc. qtz. sdst f. qtz. silty sdst-limonitic dk. gry siltst. biogenic pyrite
200- 10+		°	?			D x x	✓
295-305+		x	50			D A A	✓
395-405+	°	x D °	200			D A A	✓
495-505+		x x x	?			D C C	✓
595-605+		°	500	25		D A A	✓
695-705+		x x x	500	25		D A A	✓
700- 10+		x x x x	200	20		D	✓
800- 10+	° °	°	250	10	20	D A r	✓
900- 10+	x ° °	°	250	30	10	D C r	✓
1000- 10+	°	x	100	20	20	D C r	✓
1100- 10+	° x	x	200	10	30	A	✓
1200- 10+	x x x	x	100	20	50	r A	✓
1300- 10+	x x x	°	500	10	30	C C r	✓
1400- 10+	x ° x x	x °	250	40	20		✓
1500- 10+	° ° °	°	50	5	60		✓
1600- 10+	° ° °	° °	50	20	60	r A	✓
1700- 10+	* * *	* *	50		100	A	✓
1740- 50+	* * *	* *	50		100	A	✓

TABLE 3: BENTHONIC FORAMINIFERA and RESIDUE GRAIN DISTRIBUTION - YOLLA # 1 - BASS BASIN.

Symbols ° = 1-20 specimens A = Abundant ✓ = present
x = >20 specimens C = Common ? = queried
D = Dominant >60% of fauna r = rare
* = probable cavings

David Taylor,
August 23, 1985.

TABLE 4

MICROPALAEONTOLOGICAL DATA SHEET

BASIN: BASSELEVATION: KB: GL: WELL NAME: YOLLA # 1TOTAL DEPTH:

AGE	FORAM. ZONULES	HIGHEST DATA					LOWEST DATA				
		Preferred Depth	Rtg	Alternate Depth	Rtg	Two Way Time	Preferred Depth	Rtg	Alternate Depth	Rtg	Two Way Time
PLEIS- TOCENE	A ₁										
	A ₂										
PLIO- CENE	A ₃										
	A ₄										
MIOCENE	B ₁										
	B ₂										
	C										
	D ₁										
	D ₂	700	4								
	E ₁						800	3			
	E ₂	900	3				900	3			
	F	1000	3								
	G						1400	4			
	H ₁										
	H ₂										
OLIGOCENE	I ₁										
	I ₂										
	J ₁	1500	3								
	J ₂						1600	3			
EOCENE	K	1700*	4				1740*	4			
	Pre-K	1700*	4				1740*	4			

COMMENTS: *Demons Bluff Formation lacking planktonic foraminifera.

Elsewhere ranges from Top Eocene (=K) into Mid Eocene.

CONFIDENCE RATING:

- 0: SWC or Core - Complete assemblage (very high confidence).
- 1: SWC or Core - Almost complete assemblage (high confidence).
- 2: SWC or Core - Close to zonule change but able to interpret (low confidence).
- 3: Cuttings - Complete assemblage (low confidence).
- 4: Cuttings - Incomplete assemblage, next to uninterpretable or SWC with depth suspicion (very low confidence).

NOTE: If an entry is given a 3 or 4 confidence rating, an alternative depth with a better confidence rating should be entered, if possible. If a sample cannot be assigned to one particular zone, then no entry should be made, unless a range of zones is given where the highest possible

DITCH CUTTING SAMPLES Intervals in Metres	FORAMINIFERA ✓ present NFF = not found	ARENACEOUS FORAMINIFERA <i>Psammospheara</i> sp. <i>Bathysphion</i> spp. <i>Reophax</i> spp. <i>Ammodiscus</i> sp. <i>Trochammina</i> sp. <i>Ammodaculites</i> sp.	BIOGENIC PYRITE as spheres	DISSEMINATED PLANT DEBRIS	SAND/SHALE RATIO	SAND/SHALE LAMINAE	? VOLCANOGENIC GRAINS	DINOFLAGELLATE FREQUENCY from Roger Morgan	DITCH CUTTING SAMPLES Intervals in Metres
2228 - 2237	✓	14 12 15 5 2		✓	50/50	✓		--	2228 - 2237
2246 - 2255	✓	5 5		✓	50/50	✓		trace	2246 - 2255
2273 - 2282	✓	5 2		✓	20/80	✓		"	2273 - 2282
2282 - 2291	✓	10 10		✓	20/80	✓		"	2282 - 2291
2291 - 2300	✓	5 2		✓	30/70	✓		"	2291 - 2300
2300 - 2309	✓	10		✓	20/80	✓		"	2300 - 2309
2327 - 2336	✓	15 8		✓	50/50	✓		"	2327 - 2336
2354 - 2363	✓	10 5		✓	50/50	✓		"	2354 - 2363
2363 - 2372	NFF			-	80/20	-		--	2363 - 2372
2372 - 2381	NFF			-	80/20	-		--	2372 - 2381
2381 - 2390	✓	15 5		✓	30/70	✓	?	--	2381 - 2390
2399 - 2408	✓	20 2 8	1	✓	30/70	✓		--	2399 - 2408
NO SAMPLE								15%	2408 - 2417
2417 - 2426	✓	20 5 5		-	50/50	-		--	2417 - 2426
2426 - 2435	✓	15 5		-	40/60	-		--	2426 - 2435
2462 - 2471	NFF			-	90/10	-	?	trace	2462 - 2471
2471 - 2480	NFF			-	90/10	-	?	"	2471 - 2480
2508 - 2517	NFF			-	90/10	-	80%	--	2508 - 2517
2621 - 2630	NFF			-	90/10	-	90%	--	2621 - 2630
2630 - 2639	NFF			-	90/10	-	90%	trace	2630 - 2639
2729 - 2738	NFF			-	90/10	-	80%	"	2729 - 2738
2738 - 2747	NFF			-	80/20	-	80%	"	2738 - 2747

TABLE 5 - MICROPALAEONTOLOGICAL DATA - EASTERN VIEW COAL
MEASURES - YOLLA # 1.

Report; DT/01/86
David Taylor
January 9th, 1986.

PALYNOLOGY
of
YOLLA-1

Modified from report
by Dr Roger Morgan

SUMMARY

1680 m (cutts) - (1810 m swc) 1832 m (cutts) : middle N. asperus Zone : late Eocene : nearshore marine : immature.

1832 m (cutts) - 2048 m (cutts) : lower N. asperus Zone : middle Eocene : marginal marine : marginally mature.

2066 m (cutts) - 2174 m (cutts) : P. asperopolus Zone : middle Eocene : non-marine : marginally mature.

2210 m (cutts) - 2444 m (cutts) : upper M. diversus Zone : early Eocene : marginal marine to nearshore marine : marginally mature at the top, mature at the base with rare fully mature and post-mature grains.

2454 m (cutts) - 2508 m (cutts) : middle M. diversus Zone : early Eocene : marginal marine : mature at the top, fully mature to post-mature at the base.

2528 m (cutts) - 2555 m (cutts) : indeterminate : rare post-mature and mature grains seen.

2573 m (cutts) - 2630 m (swc) : middle M. diversus Zone : early Eocene : marginal marine : mature.

2675 m (cutts) - 2783 m (cutts) : lower M. diversus Zone : early Eocene : marginal marine : mature with vast range of maturity seen in cuttings samples.

2801 - 2881 m (cutts) : upper L. balmei : late Paleocene : non-marine : fully mature.

2885 m (swc) - (3028 m swc) 3052 m (cutts) : lower L. balmei : early Paleocene : non-marine : fully mature becoming post-mature at the base.

INTRODUCTION

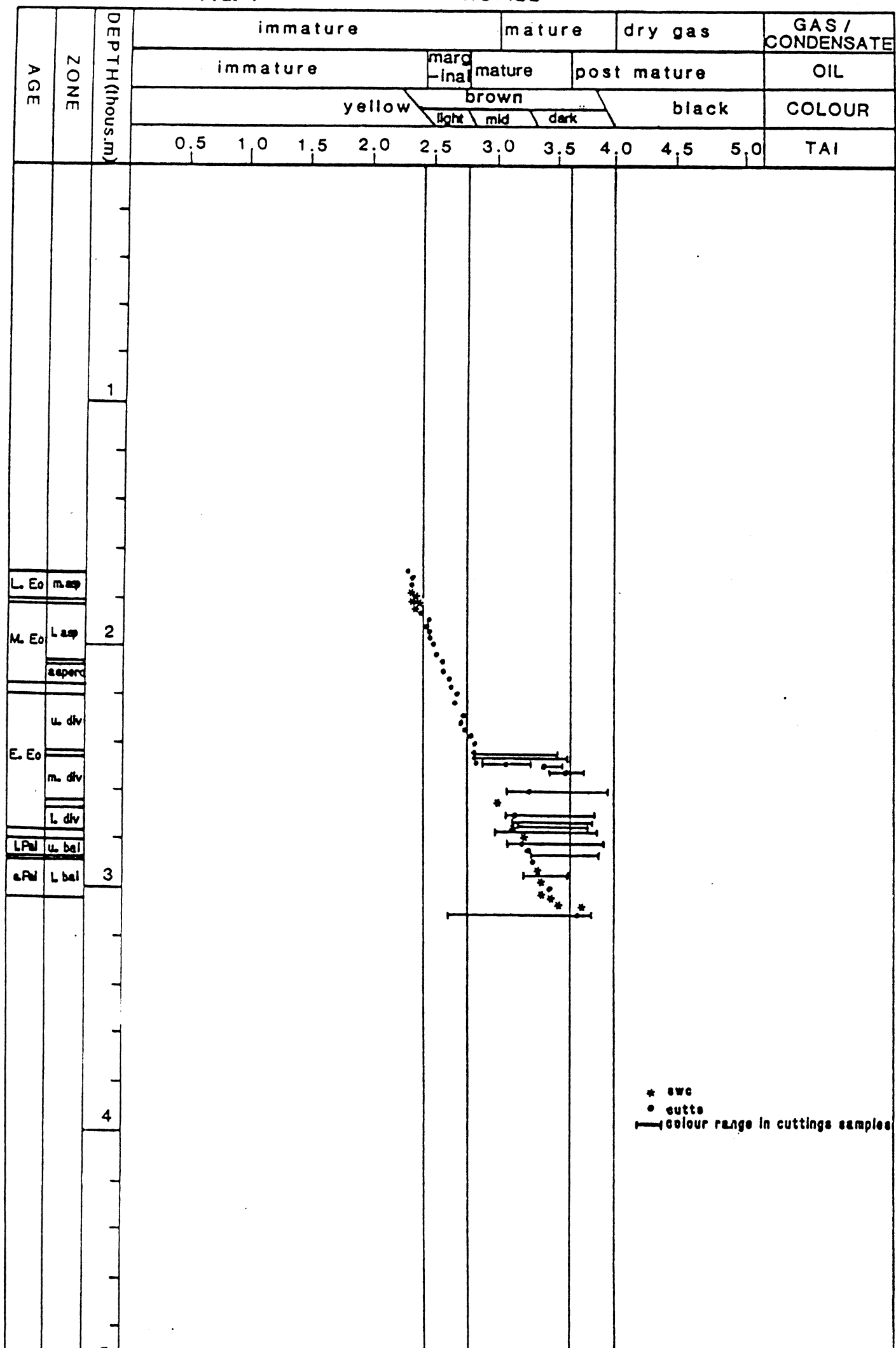
Thirteen samples were examined on a "quick look" basis to provide control during the drilling of the well. Forty-one more samples (thirteen sidewall cores and twenty-eight cuttings samples) have been subsequently processed and examined in detail. All samples are reported herein. The samples examined during drilling are shown on the range charts with an asterisk.

Palynomorph occurrence data are presented in Appendix A, and are the basis for the assignment of the studied section to eight spore-pollen Zones of Paleocene to late Eocene age. The zonation is that of Stover and Evans (1973) and Stover and Partridge (1973), set up in the Gippsland Basin, and modified for the Bass Basin by Partridge (1973).

No formal dinoflagellate zonation has been published for the Gippsland or Bass Basins, although Harris (1985) has recently published some dinoflagellate zones for part of the Eocene of the Otway and St. Vincent Basins. Partridge (1976) published a table showing zone names in the Gippsland Basin but charts defining these zones were never published. Neither of these zonations are entirely relevant, but elements of them are discussed herein.

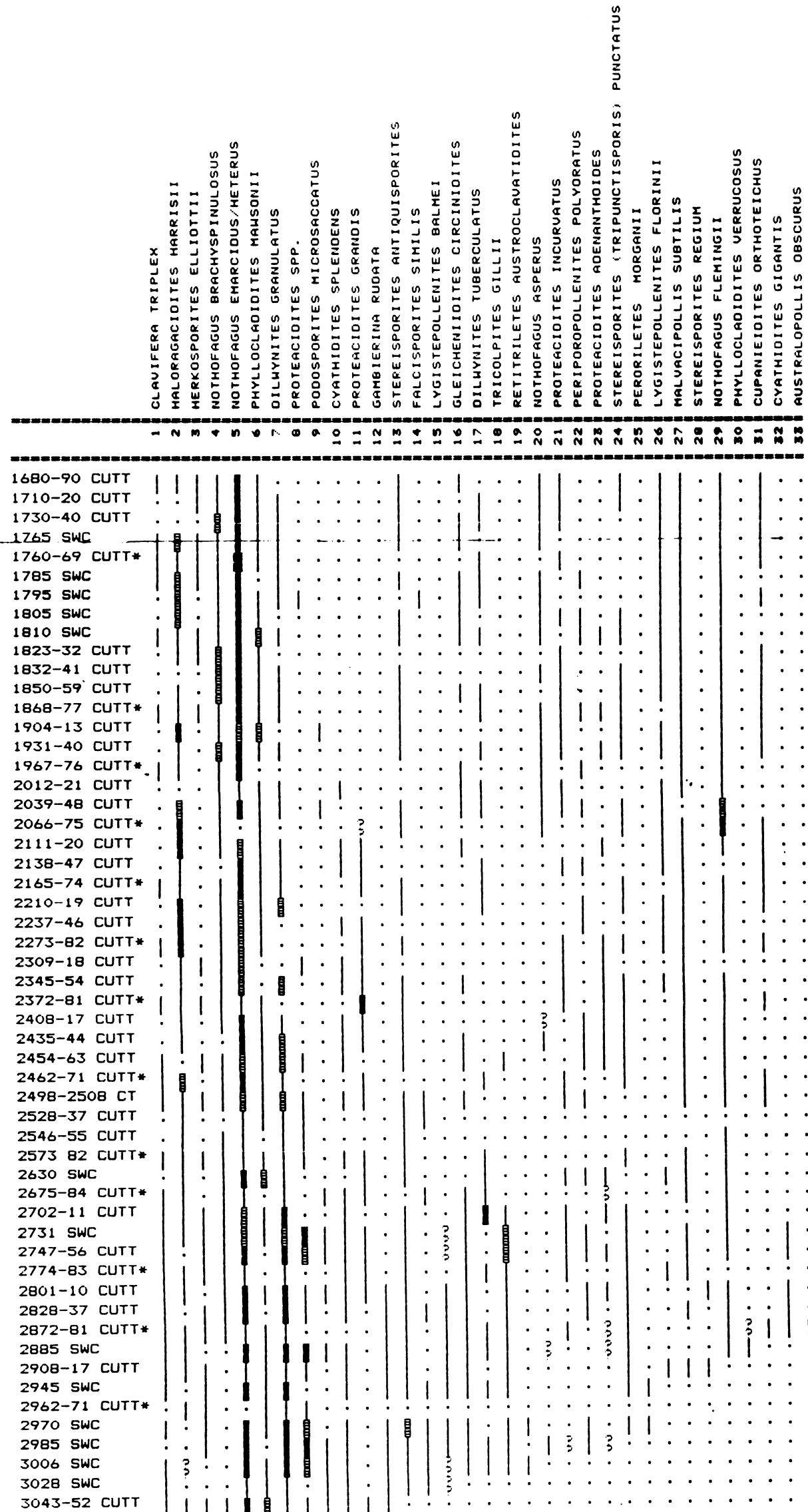
Maturity data was generated in the form of Spore Colour Index, and is plotted on Figure 1: Maturity Profile of Amoco Yolla-1. The data might be considered to be unreliable as they are largely generated from cuttings samples. However, given the available sidewall core control, and knowing the low level of contamination as seen during biostratigraphic work, these data can be considered to be of good quality.

YOLLA - 1



APPENDIX A

Palynomorph Occurrence Data



		NOTHOFAGUS DEMINUTUS	TRICOLPITES PHILLIPSII	HELICIPORITES ASTRUS	TRICOLPORITES LEUROS	PROTEACIDITES TUBERCULATUS	MILFORDIA HOMEOPUNCTATUS	TRICOLPITES THOMASII
		1100	1101	1102	1103	1104	1105	1106
1680-90	CUTT	.	.	.	.	.	.	.
1710-20	CUTT	.	.	.	.	.	.	.
1730-40	CUTT	.	.	.	.	.	.	.
1765	SWC	.	.	.	.	.	.	.
1760-69	CUTT*	.	.	.	.	.	.	.
1785	SWC	—	—	—	—	—	—	—
1795	SWC	.	.	.	.	.	.	.
1805	SWC	.	.	.	.	.	.	.
1810	SWC	.	.	.	.	.	.	.
1823-32	CUTT	.	.	.	.	.	.	.
1832-41	CUTT	.	.	.	.	.	.	.
1850-59	CUTT	.	.	.	.	.	.	.
1868-77	CUTT*	.	.	.	.	.	.	.
1904-13	CUTT	.	.	.	.	.	.	.
1931-40	CUTT	.	.	.	.	.	.	.
1967-76	CUTT*	.	.	.	.	.	.	.
2012-21	CUTT	.	.	.	.	.	.	.
2039-48	CUTT	.	.	.	.	.	.	.
2066-75	CUTT*	.	.	.	.	.	.	.
2111-20	CUTT	.	.	.	.	.	.	.
2138-47	CUTT	.	.	.	.	.	.	.
2165-74	CUTT*	.	.	.	.	.	.	.
2210-19	CUTT	.	.	.	.	.	.	.
2237-46	CUTT	.	.	.	.	.	.	.
2273-82	CUTT*	.	.	.	.	.	.	.
2309-18	CUTT	.	.	.	.	.	.	.
2345-54	CUTT	.	.	.	.	.	.	.
2372-81	CUTT*	.	.	.	.	.	.	.
2408-17	CUTT	.	.	.	.	.	.	.
2435-44	CUTT	.	.	.	.	.	.	.
2454-63	CUTT	.	.	.	.	.	.	.
2462-71	CUTT*	.	.	.	.	.	.	.
2498-2508	CT	.	.	.	.	.	.	.
2528-37	CUTT	.	.	.	.	.	.	.
2546-55	CUTT	.	.	.	.	.	.	.
2573	B2 CUTT*	.	.	.	.	.	.	.
2630	SWC	.	.	.	.	.	.	.
2675-84	CUTT*	.	.	.	.	.	.	.
2702-11	CUTT	.	.	.	.	.	.	.
2731	SWC	.	.	.	.	.	.	.
2747-56	CUTT	.	.	.	.	.	.	.
2774-83	CUTT*	.	.	.	.	.	.	.
2801-10	CUTT	.	.	.	.	.	.	.
2828-37	CUTT	.	.	.	.	.	.	.
2872-81	CUTT*	.	.	.	.	.	.	.
2885	SWC	.	.	.	.	.	.	.
2908-17	CUTT	.	.	.	.	.	.	.
2945	SWC	.	.	.	.	.	.	.
2962-71	CUTT*	.	.	.	.	.	.	.
2970	SWC	.	.	.	.	.	.	.
2985	SWC	.	.	.	.	.	.	.
3006	SWC	.	.	.	.	.	.	.
3028	SWC	.	.	.	.	.	.	.
3043-52	CUTT	.	.	.	.	.	.	.

1680-90	CUTT	34	CERATOSPORITES EQUALIS
1710-20	CUTT	35	VERRUCOSISPORITES KOPUKUENSIS
1730-40	CUTT	36	PROTEACIDITES CLARUS
1765	SWC	37	DACRYCARPITES AUSTRALIENSIS
1760-69	CUTT*	38	MYRTACEIDITES PARVUS/MESONESUS
1785	SWC	39	PROTEACIDITES ANNULARIS
1795	SWC	40	TRIPOROPOLLENITES AMBIGUUS
1805	SWC	41	HALUACIPOLLIS DIVERSUS
1810	SWC	42	ARAUCARIACITES AUSTRALIS
1823-32	CUTT	43	TRICOLPITES CONFESSUS
1832-41	CUTT	44	POLYCOLPITES ESORALTEUS
1850-59	CUTT	45	PERIPOROPOLLENITES DEMARCATUS
1868-77	CUTT*	46	BEAUPREARIDITES VERRUCOSUS
1904-13	CUTT	47	ERICIPITES SCABRATUS
1931-40	CUTT	48	PROTEACIDITES LAPIS
1967-76	CUTT*	49	BANKSIEACIDITES ELONGATUS
2012-21	CUTT	50	LILIACIDITES BAINII
2039-48	CUTT	51	TRICOLPORITES ESTOUTUS
2066-75	CUTT*	52	PROTEACIDITES RUGULATUS
2111-20	CUTT	53	PROTEACIDITES KOPIENSIS
2138-47	CUTT	54	PROTEACIDITES PSEUDOMOIDES
2165-74	CUTT*	55	TRICOLPORITES SPHERICA
2210-19	CUTT	56	FOVEOTRILETES BALTEUS
2237-46	CUTT	57	ANACOLOSIDITES ACUTULLUS
2273-82	CUTT*	58	PROTEACIDITES LEIGHTONII
2309-18	CUTT	59	PROTEACIDITES ORNATUS
2345-54	CUTT	60	MYRTACEIDITES TENUIS
2372-81	CUTT*	61	INTEGRICORPUS ANTIPODUS
2408-17	CUTT	62	RICCIA BOXATUS
2435-44	CUTT	63	PROTEACIDITES TENUIEXINUS
2454-63	CUTT	64	PROTEACIDITES PACHYPOLUS
2462-71	CUTT*	65	PROTEACIDITES OBESOLABRUS
2498-2508	CT	66	LILIACIDITES LANCEOLATUS
2528-37	CUTT		
2546-55	CUTT		
2573	82 CUTT*		
2630	SWC		
2675-84	CUTT*		
2702-11	CUTT		
2731	SWC		
2747-56	CUTT		
2774-83	CUTT*		
2801-10	CUTT		
2828-37	CUTT		
2872-81	CUTT*		
2885	SWC		
2908-17	CUTT		
2945	SWC		
2962-71	CUTT*		
2970	SWC		
2985	SWC		
3006	SWC		
3028	SWC		
3043-52	CUTT		

1680-90 CUTT	67	SANTALUMIDITES CAINOZOICUS
1710-20 CUTT	68	INTRATRIPOROPOLLENITES NOTABILIS
1730-40 CUTT	69	KUYLISPORITES WATERBOLKII
1765 SWC	70	SAPOTACEOIDAEPOLENITES ROTUNDUS
1760-69 CUTT*	71	SPINIZONOCOLPITES PROMINATUS
1785 SWC	72	NOTHOFAGUS FALCATUS
1795 SWC	73	ANACOLOSIDITES LUTEOIDES
1805 SWC	74	PROTEACIDITES ASPEROPOLUS
1810 SWC	75	MALVACIPOLLIS GRANOIS
1823-32 CUTT	76	TRIPOROPOLLENITES CHNOSUS
1832-41 CUTT	77	ILEXPOLLENITES ANGULOCLOAVATUS
1850-59 CUTT	78	PROTEACIDITES CRASSUS
1868-77 CUTT*	79	GO THANIPOLLIS BASSENSIS
1904-13 CUTT	80	BEAUPREACIDITES ELEGANSIFORMIS
1931-40 CUTT	81	PROTEACIDITES DELICATUS
1967-76 CUTT*	82	PROTEACIDITES TUBERCULIFORMIS
2012-21 CUTT	83	NOTHOFAGUS VANSTEENISII
2039-48 CUTT	84	LATROBOSPORITES CRASSUS
2066-75 CUTT*	85	PROTEACIDITES SCITUS
2111-20 CUTT	86	TRICOLPITES SINATUS
2138-47 CUTT	87	PERIPOROPOLLENITES VESICUS
2165-74 CUTT*	88	GEMMATRICOLPORITES GESTUS
2210-19 CUTT	89	PROTEACIDITES RECTOMARGINIS
2237-46 CUTT	90	PROTEACIDITES RECAVUS
2273-82 CUTT*	91	PROTEACIDITES STIPLATUS
2309-18 CUTT	92	TRIORITES MAGNIFICUS
2345-54 CUTT	93	MYRTACEIDITES VERRUCOSUS
2372-81 CUTT*	94	POLYCOLPITES SIMPLEX
2408-17 CUTT	95	MILFORDIA HYPOLAENOIDES
2435-44 CUTT	96	PROTEACIDITES RETICULATUS
2454-63 CUTT	97	AGLAOREIDIA QUALUMIS
2462-71 CUTT*	98	TRICOLPORITES DELICATUS
2498-2508 CT	99	PROTEACIDITES LATROBENSIS
2528-37 CUTT		
2546-55 CUTT		
2573 82 CUTT*		
2630 SWC		
2675-84 CUTT*		
2702-11 CUTT		
2731 SWC		
2747-56 CUTT		
2774-83 CUTT*		
2801-10 CUTT		
2828-37 CUTT		
2872-81 CUTT*		
2885 SWC		
2908-17 CUTT		
2945 SWC		
2962-71 CUTT*		
2970 SWC		
2985 SWC		
3006 SWC		
3028 SWC		
3043-52 CUTT		

SPECIES LOCATION INDEX
Index numbers are the columns in which species appear.

INDEX NUMBER	SPECIES
97	AGLAOREIDIA QUALUMIS
57	ANACOLOSIDITES ACUTULLUS
73	ANACOLOSIDITES LUTEOIDES
42	ARAUCARIACITES AUSTRALIS
33	AUSTRALOPOLLIS OBSCURUS
49	BANKSIEACIDITES ELONGATUS
80	BEAUPREIDITES ELEGANSIFORMIS
46	BEAUPREIDITES VERRUCOSUS
34	CERATOSPORITES EQUALIS
1	CLAVIFERA TRIPLEX
31	CUPANIEIDITES ORTHOTEICHUS
32	CYATHIDITES GIGANTIS
10	CYATHIDITES SPLENDENS
37	DACRYCARPITES AUSTRALIENSIS
7	DILWYNITES GRANULATUS
17	DILWYNITES TUBERCULATUS
47	ERICIPITES SCABRATUS
14	FALCISPORITES SIMILIS
56	FOVEOTRILETES BALTEUS
12	GAMBIERINA RUDATA
88	GEMMATRICOLPORITES GESTUS
16	GLEICHENIIDITES CIRCINIDITES
79	GOTHANIPOLLIS BASSENSIS
2	HALORAGACIDITES HARRISII
102	HELCIPORITES ASTRUS
3	HERKOSPORITES ELLIOTTII
77	ILEXPOLLENITES ANGULOCLAVATUS
61	INTEGRICORPUS ANTIPODUS
68	INTRATRIPOROPOLLENITES NOTABILIS
69	KUYLISPORITES WATERBOLKII
84	LATROBOSPORITES CRASSUS
50	LILIIACIDITES BAINII
66	LILIIACIDITES LANCEOLATUS
15	LYGISTEPOLLENITES BALMEI
26	LYGISTEPOLLENITES FLORINII
41	MALVACIPOLLIS DIVERSUS
75	MALVACIPOLLIS GRANDIS
27	MALVACIPOLLIS SUBTILIS
105	MILFORDIA HOMEOPUNCTATUS
95	MILFORDIA HYPOLAENOIDES
38	MYRTACEIDITES PARVUS/MESONESUS
60	MYRTACEIDITES TENUIS
93	MYRTACEIDITES VERRUCOSUS
20	NOTHOFAGUS ASPERUS
4	NOTHOFAGUS BRACHYSPINULOSUS
100	NOTHOFAGUS DEMINUTUS
5	NOTHOFAGUS EMARCIDUS/HETERUS
72	NOTHOFAGUS FALCATUS
29	NOTHOFAGUS FLEMINGII
83	NOTHOFAGUS VANSTEENISII
45	PERIPOROPOLLENITES DEMARCATUS
22	PERIPOROPOLLENITES POLYORATUS
87	PERIPOROPOLLENITES VESICUS
25	PERORILETES MORGANII
6	PHYLLOCLADIDITES MAWSONII
30	PHYLLOCLADIDITES VERRUCOSUS
9	PODOSPORITES MICROSCACATUS
44	POLYCOLPITES ESOBALTEUS
94	POLYCOLPITES SIMPLEX
23	PROTEACIDITES ADENANTHOIDES
39	PROTEACIDITES ANNULARIS
74	PROTEACIDITES ASPEROPOLUS
36	PROTEACIDITES CLARUS
78	PROTEACIDITES CRASSUS
81	PROTEACIDITES DELICATUS
11	PROTEACIDITES GRANDIS
21	PROTEACIDITES INCURVATUS
53	PROTEACIDITES KOPIENSIS
48	PROTEACIDITES LAPIS
99	PROTEACIDITES LATROBENSIS
58	PROTEACIDITES LEIGHTONII
65	PROTEACIDITES OBESOLABRUS
59	PROTEACIDITES ORNATUS
64	PROTEACIDITES PACHYPOLUS
54	PROTEACIDITES PSEUDOMOIDES
90	PROTEACIDITES RECAVUS
89	PROTEACIDITES RECTOMARGINIS
96	PROTEACIDITES RETICULATUS
52	PROTEACIDITES RUGULATUS
85	PROTEACIDITES SCITUS
8	PROTEACIDITES SPP.
91	PROTEACIDITES STIPPLATUS
63	PROTEACIDITES TENUIEXINUS
104	PROTEACIDITES TUBERCULATUS
82	PROTEACIDITES TUBERCULIFORMIS
19	RETITRILETES AUSTRICLAVATIDITES
62	RICCIA BOXATUS
67	SANTALUMIDITES CAINOZOICUS
70	SAPOTACEOIDAEPPOLLENITES ROTUNDUS
71	SPINIZONOCOLPITES PROMINATUS
24	STEREISPORITES (TRIPUNCTISPORIS) PUNCTATUS
13	STEREISPORITES ANTIQUISPORITES
28	STEREISPORITES REGIUM
43	TRICOLPITES CONFESSUS
18	TRICOLPITES GILLII
101	TRICOLPITES PHILLIPSII
86	TRICOLPITES SIMATUS
106	TRICOLPITES THOMASII
98	TRICOLPORITES DELICATUS
51	TRICOLPORITES ESTOUTUS
103	TRICOLPORITES LEUROS
55	TRICOLPORITES SPHAERICA
92	TRIORITES MAGNIFICUS
40	TRIPOROPOLLENITES AMBIGUUS
76	TRIPOROPOLLENITES CHNOSUS
35	VERRUCOSISPORITES KOPUKUENSIS

CHECKLIST OF GRAPHIC ABUNDANCE BY LOWEST APPEARANCE

[illegible]

1680-90 CUTT	34	PTHANOPERIDIUM COMATUM
1710-20 CUTT	35	ACHOMOSPHAERA SPP.
1730-40 CUTT	36	BACCHIDIINIUM POLYPES
1765 SWC	37	LINGULODINIUM MACHAEROPHORUM
1760-69 CUTT*	38	SAHLANDIA RETICULIFERA
1785 SWC	39	SYSTEMATOPHORA PLACACANTHA
1795 SWC	40	CORRUDINIUM INCOMPOSITUM
1805 SWC	41	CYCLOPSIELLA VIETA
1810 SWC	42	IMPLETOSPHAERIDIUM INSOLITUM
1823-32 CUTT	43	PTHANOPERIDIUM SPP.
1832-41 CUTT	44	DAPSILIDIINIUM PASTIELSII
1850-59 CUTT	45	SCHEMATOPHORA SPECIOSA
1868-77 CUTT*	46	TECTATODINIUM PELLITUM
1904-13 CUTT	47	HYSTRICKOKOLPOMA RIGAUORE
1931-40 CUTT	48	KENLEYIA LEPTOCERATA
1967-76 CUTT*	49	KENLEYIA LOPHOPHORA
2012-21 CUTT	50	KENLEYIA PACHYCRATA
2039-48 CUTT	51	LINGULODINIUM MACHAEROPHORUM
2066-75 CUTT*	52	MICRHYSTRIDIUM SPP.
2111-20 CUTT	53	MILLIOUDODINIUM TENUITABULATUM
2138-47 CUTT	54	MOKKALLACYSTA SP.
2165-74 CUTT*	55	MURATODINIUM FIMBRIATUM
2210-19 CUTT	56	OPERCULODINIUM CENTROCARPUM
2237-46 CUTT	57	PARALECANEILLA INDENTATA
2273-82 CUTT*	58	PTHANOPERIDIUM COMATUM
2309-18 CUTT	59	PTHANOPERIDIUM SPP.
2345-54 CUTT	60	SAHLANDIA RETICULIFERA
2372-81 CUTT*	61	SCHEMATOPHORA SPECIOSA
2404-17 CUTT	62	SPINIFERITES RAMOSUS
2435-44 CUTT	63	SYSTEMATOPHORA PLACACANTHA
2454-63 CUTT	64	TECTATODINIUM PELLITUM
2462-71 CUTT*	65	THALASSIPHORA PELAGICA
2498-205 CUT	66	TURBIOSSPHAERA GALEATA
2528-37 CUTT		
2546-55 CUTT		
2573-82 CUTT*		
2630 SWC		
2675-84 CUTT*		
2702-11 CUTT		
2731 SWC		
2747-56 CUTT		
2774-83 CUTT*		
2801-10 CUTT		
2828-37 CUTT		
2872-81 CUTT*		
2885 SWC		
2908-17 CUTT		
2945 SWC		
2962-71 CUTT*		
2970 SWC		
2985 SWC		
3006 SWC		
3028 SWC		
3043-52 CUTT		

SPECIES LOCATION INDEX

Index numbers are the columns in which species appear.

INDEX
NUMBER

SPECIES

7	ACHOMOSPHAERA ALICORNU
35	ACHOMOSPHAERA SPP.
21	ADNATOSPHAERIDIUM SP.
4	APECTODINIUM HOMOMORPHUM
5	APECTODINIUM LONGISPINOSA
8	AREOLIGERA SENONENSIS
12	AREOLIGERA SPP.
18	AREOSPHAERIDIUM ARCUATUM
36	BACCHIIDIUM POLYPES
22	BOTRYOCOCCUS
23	CORDOSPHAERIDIUM FIBROSPINOSUM
3	CORDOSPHAERIDIUM INODES
31	CORDOSPHAERIDIUM MULTISPINOSUM
40	CORRUDINIUM INCOMPOSITUM
41	CYCLOPSIELLA VIETA
44	DAPSILIDIUM PASTIELSII
6	DEFLANDREA PHOSPHORITICA
27	DEFLANDREA TRUNCATA
19	DIPHES COLLIGERUM
33	DISTATODINIUM ELLIPTICUM
13	EOCLADOPYXIS PENICULATA
20	FIBROCYSTA BIPOLARE
24	FIBROCYSTA SPP.
9	GLAPHYROCYSTA SPP.
32	HETERAULACACYSTA PAXILLA
1	HOMOTRIBLIUM TASMANIENSE
47	HYSTRICKOKOLPOMA RIGAUDAE
42	IMPLETOSPHAERIDIUM INSOLITUM
28	KENLEYIA LEPTOCERATA
28	KENLEYIA LEPTOCERATA
15	KENLEYIA LOPHOPHORA
15	KENLEYIA LOPHOPHORA
29	KENLEYIA PACHYCRATA
29	KENLEYIA PACHYCRATA
37	LINGULODINIUM MACHAEROPHORUM
37	LINGULODINIUM MACHAEROPHORUM
14	MICRHYSTRIDIUM SPP.
14	MICRHYSTRIDIUM SPP.
30	MILLIOUDODINIUM TENUITABULATUM
30	MILLIOUDODINIUM TENUITABULATUM
2	MORKALLACYSTA SP.
2	MORKALLACYSTA SP.
16	MURATODINIUM FIMBRIATUM
16	MURATODINIUM FIMBRIATUM
10	OPERCULODINIUM CENTROCARPUM
10	OPERCULODINIUM CENTROCARPUM
25	PARALECANIELLA INDENTATA
25	PARALECANIELLA INDENTATA
34	PHTHANOPERIDINIUM COMATUM
34	PHTHANOPERIDINIUM COMATUM
43	PHTHANOPERIDINIUM SPP.
43	PHTHANOPERIDINIUM SPP.
38	SAMLANDIA RETICULIFERA
38	SAMLANDIA RETICULIFERA
45	SCHEMATOPHORA SPECIOSA
45	SCHEMATOPHORA SPECIOSA
11	SPINIFERITES RAMOSUS
11	SPINIFERITES RAMOSUS
39	SYSTEMATOPHORA PLACACANTHA
39	SYSTEMATOPHORA PLACACANTHA
46	TECTATODINIUM PELLITUM
46	TECTATODINIUM PELLITUM
26	THALASSIPHORA PELAGICA
26	THALASSIPHORA PELAGICA
17	TURBIOSPHAERA GALEATA
17	TURBIOSPHAERA GALEATA

PETROLEUM GEOCHEMISTRY

of

YOLLA-1

PART I: HYDROCARBON SOURCE ROCK EVALUATION STUDY

PART II: VITRINITE REFLECTANCE DETERMINATIONS AND
ORGANIC PETROLOGY

Part I modified from report
by Paul Tybor and
Dr Garry Woodhouse of Analabs

Part II modified from report
by Dr Brian Watson of AMDEL

PART I - HYDROCARBON SOURCE ROCK EVALUATION STUDY, YOLLA-1

SUMMARY

Organic geochemical analyses performed on cuttings and sidewall cores from 1680 m to 3340 m in the Yolla-1 well drilled in the Bass Basin offshore Tasmania have indicated the following:

- The sediments may be divided into the following maturity intervals:

Interval (m)	Maturity	Generation Capability
1760 - 1967	Marginal	Pre-oil
2165 - 2971	Moderate	Early oil generative
Below 3000±	Mature	Oil generative

- At 2584 to 2651 m an intrusive rock has altered the organic matter in the adjacent rocks, which presently have mature vitrinite reflectances and Tmax temperatures. However, apparently the time involved in this heating has been short, since the hydrocarbon extracted from the sediments still retains low maturity characteristics. Mature reflectances are also present in the sediments at 3007-3016 m, which are positioned above the extrusive at 3031 m. Although these surface igneous rocks would have cooled shortly after solidification, they still probably served as good conductors of heat after burial and subsidence, especially during the recent igneous intrusive activity. As a result, the sediments adjacent to these rocks would have increased maturities.
- The late Eocene rocks from 1680-1832 m were marginally mature, and would have potentially moderate to good oil and gas generating capability at higher maturity. Minor amounts of light migrated liquid hydrocarbon are present in the sequence.
- The middle Eocene sediments from 1832-2210 m have marginally to moderately mature, very good to excellent gas source properties, with secondary oil generating potential at optimum maturity. This sequence contains reservoired oil at 1830-1835m.
- The early Eocene section from 2210-2584 m, above the intrusion at 2584-2651 m, has moderately mature, very good to excellent gas source character, with secondary oil generating potential at optimum maturity. This sequence contains migrated hydrocarbon at 2517-2526 m. Below the intrusion, the early Eocene section has poor hydrocarbon source rock properties.
- The late Paleocene sediments have a moderately mature, poor oil and gas source character, but contain a reservoired light liquid hydrocarbon at 2809-2824.5 m.
- The early Paleocene sediments from 2885 m to 3000± m have a moderately mature, poor hydrocarbon source character. Below 3000± m the unit is interpreted to have mature, good to excellent oil and gas source rock characteristics. These sediments may contain reservoir hydrocarbon which is similar, based on GC-MS data, to the oil recovered from 1830-1835 m.

- The oil recovered from 1830-1835 m has low maturity GC-MS maturity parameters, while the condensate produced from 2809-2824.5 m exhibits mature GC-MS characteristics. Apart from these maturity differences both hydrocarbons originated from dominantly terrestrial organic matter where conifer and angiosperm resins made contributions to their formation. These source similarities suggest the oils are genetically related, or originated from different rocks which contain a similar organic matter assemblage, and have experienced different geothermal histories. The 1830-1835 m sample may be a more localised product in which the high temperatures associated with the igneous activity in the area have matured the organic matter quickly. Due to this quick heating some of the biomarker compounds have not equilibrated, resulting in the hydrocarbon retaining immature GC-MS characteristics. A possible parent source for this type of hydrocarbon could be the organic-rich early Paleocene sediments below 3000 m, which are above the extrusive igneous rock at 3031 m. The 2809-2824.5 m condensate has probably migrated farther than the shallower crude oil, from an area where the source rock(s) have experienced a more or less normal geothermal history. Here full compound equilibration has occurred.

INTRODUCTION

Organic geochemical analyses have been performed on the following samples from Yolla-1:

Canned cuttings	83
Sidewall cores	3
Oils	2
Waters	1

The purpose of this study has been to evaluate the thermal maturity and source character of the sediments penetrated by this well. Also, the oils recovered were characterised and compared to the sediment analysed from this well.

Analytical

The eighty-three canned cuttings samples were submitted to C₁-C₇ light hydrocarbon headspace gas chromatography. Based on the results of these analyses, three samples were selected for detailed gasoline-range gas chromatography. Thirty-seven cutting samples and three sidewall cores were submitted to % total organic carbon determination, followed by Rock-Eval pyrolysis analysis on those samples containing greater than 1% TOC (34 samples). Detailed geochemical evaluations comprising extraction, liquid chromatography, C₁₂+ saturate gas-liquid chromatography and C₁-C₃₁ pyrolysis gas chromatography were carried out on nine cuttings samples and one sidewall core. Vitrinite reflectance measurements were performed by Amdel and are shown on Figures 1, 2, 4 and 5.

The two oils recovered from this well (DST 1 and DST 2) were submitted to C₁-C₃₁ whole oil gas-liquid chromatography, which included a detailed breakdown of the C₄-C₇ gasoline range compounds. The shallow oil from 1830-1835 m of DST 2 was sampled twice with both samples submitted to C₁₂ whole oil gas-liquid chromatography. The sample taken at 5.30 pm was also separated by liquid chromatography. Both oils, from DST 1 and DST 2, and one cuttings sample were analysed by gas chromatography-mass spectrometry. A water sample recovered during DST 2 had a complete water analysis carried out on it.

The results of the analyses performed may be found in the following figures and tables:

Type of Analysis	Figure	Table
ROCKS:		
C ₁ -C ₇ headspace gas chromatography	1	1
C ₄ -C ₇ detailed gasoline range gas chromatography		2
% total organic carbon determination	1,2,4,5	3
Rock-Eval pyrolysis	2,3	3
Extraction and liquid chromatography	4	4
C ₁₂ ⁺ saturate gas-liquid chromatography	5,6	5
C ₁ -C ₃₁ pyrolysis gas chromatography	7	6,7
Gas chromatography-mass spectrometry	8	8
OILS:		
C ₁ -C ₃₁ whole oil gas-liquid chromatography (DST 1 and DST 2)	9	9
C ₄ -C ₇ detailed gasoline range compositional breakdown (DST 1 and DST 2)	10	9
C ₁₂ ⁺ whole oil gas-liquid chromatography (2 - DST 2 samples)	11	10
Liquid chromatography (1 - DST 2 sample)		11
Gas chromatography-mass spectrometry (DST 1 and DST 2)	12,13	12
WATER:		
Complete water analysis		13

FIGURE 1
JANUARY 1988

ANA-LOG

HYDROCARBON SOURCE ROCK EVALUATION

AMOCO AUSTRALIA PETROLEUM COMPANY

YOLLA 1

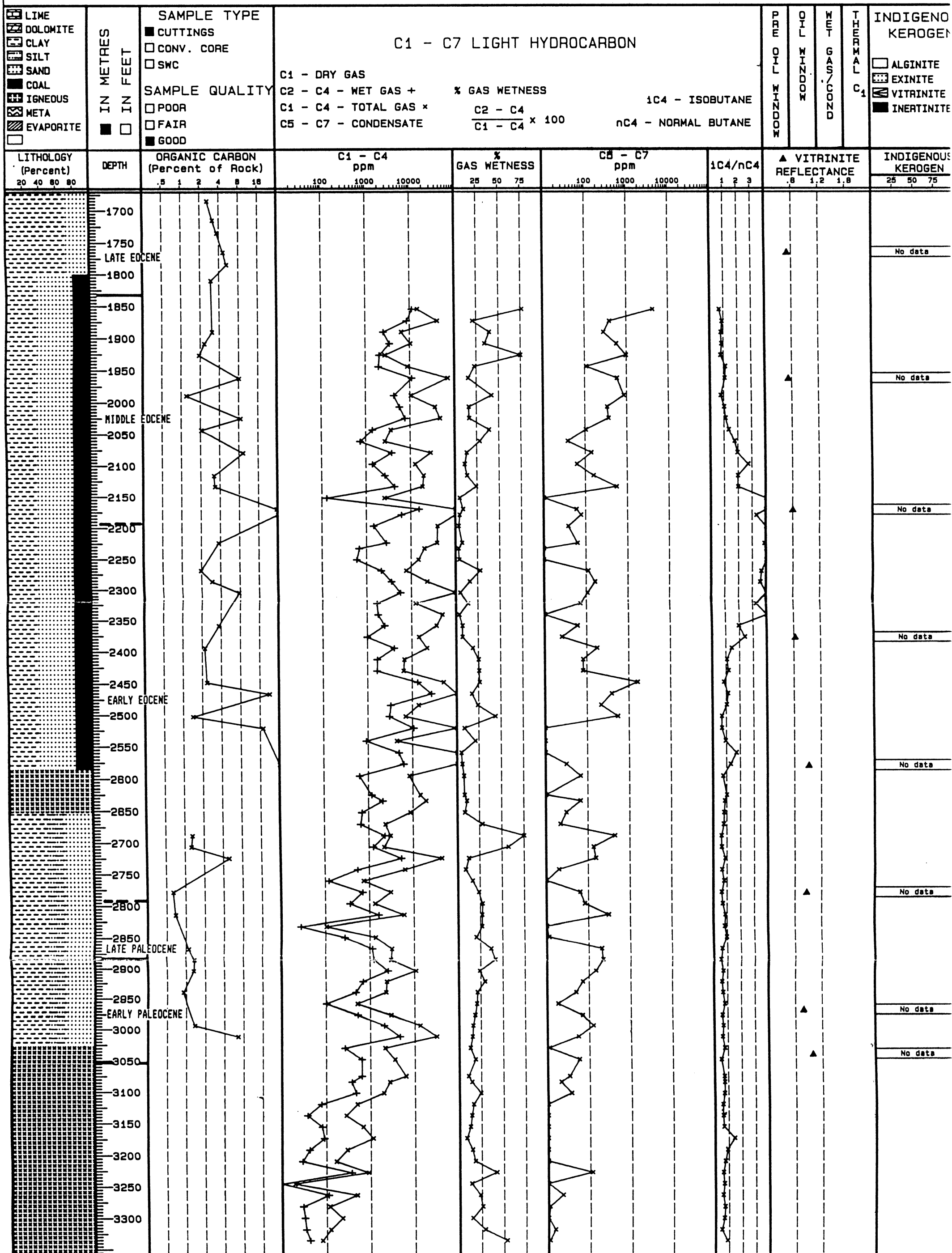


FIGURE 2
JANUARY 1986

ANA-LOG
HYDROCARBON SOURCE ROCK EVALUATION

AMOCO AUSTRALIA PETROLEUM COMPANY
YOLLA 1

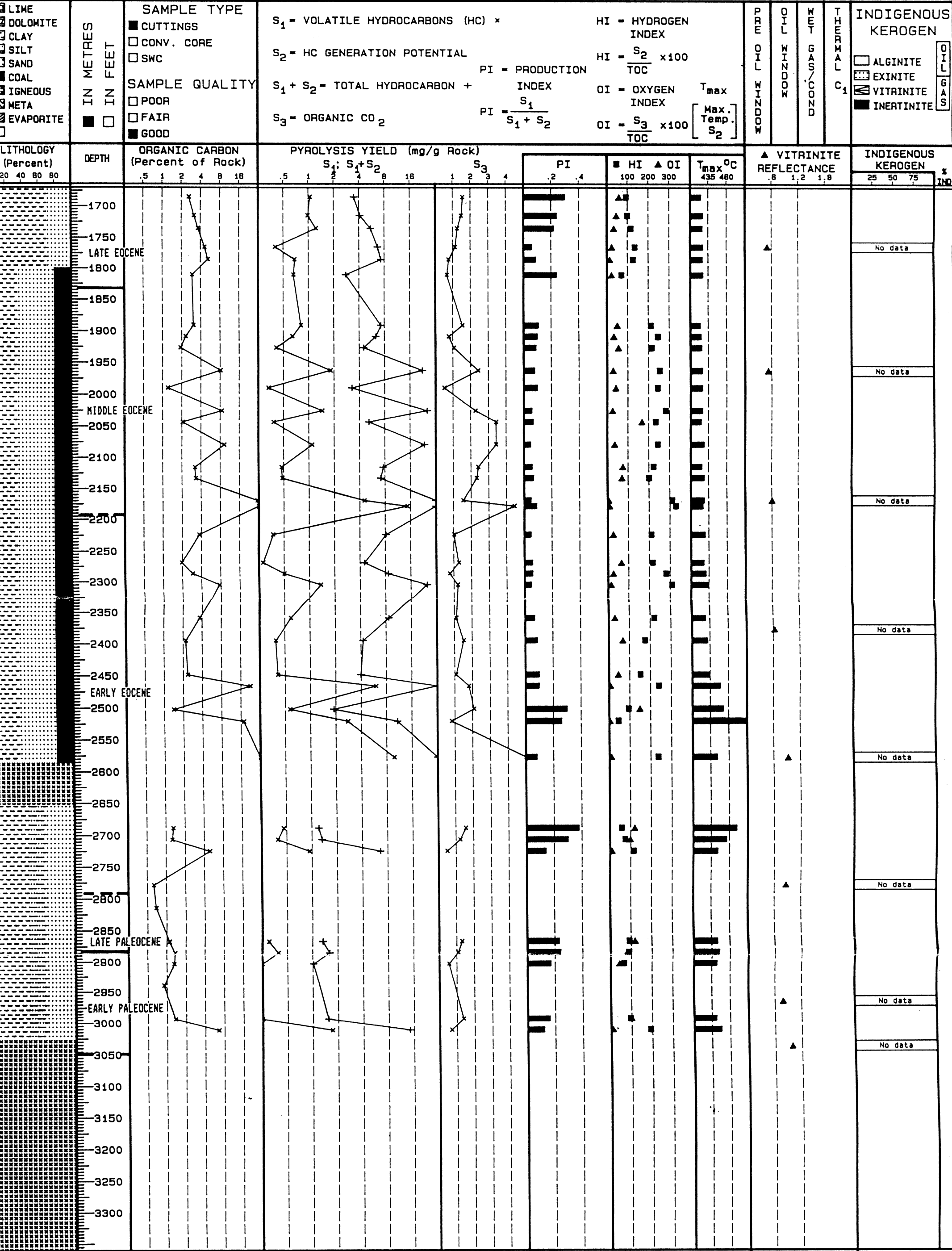


FIGURE 3
YOLLA 1
HYDROGEN INDEX vs T_{\max}

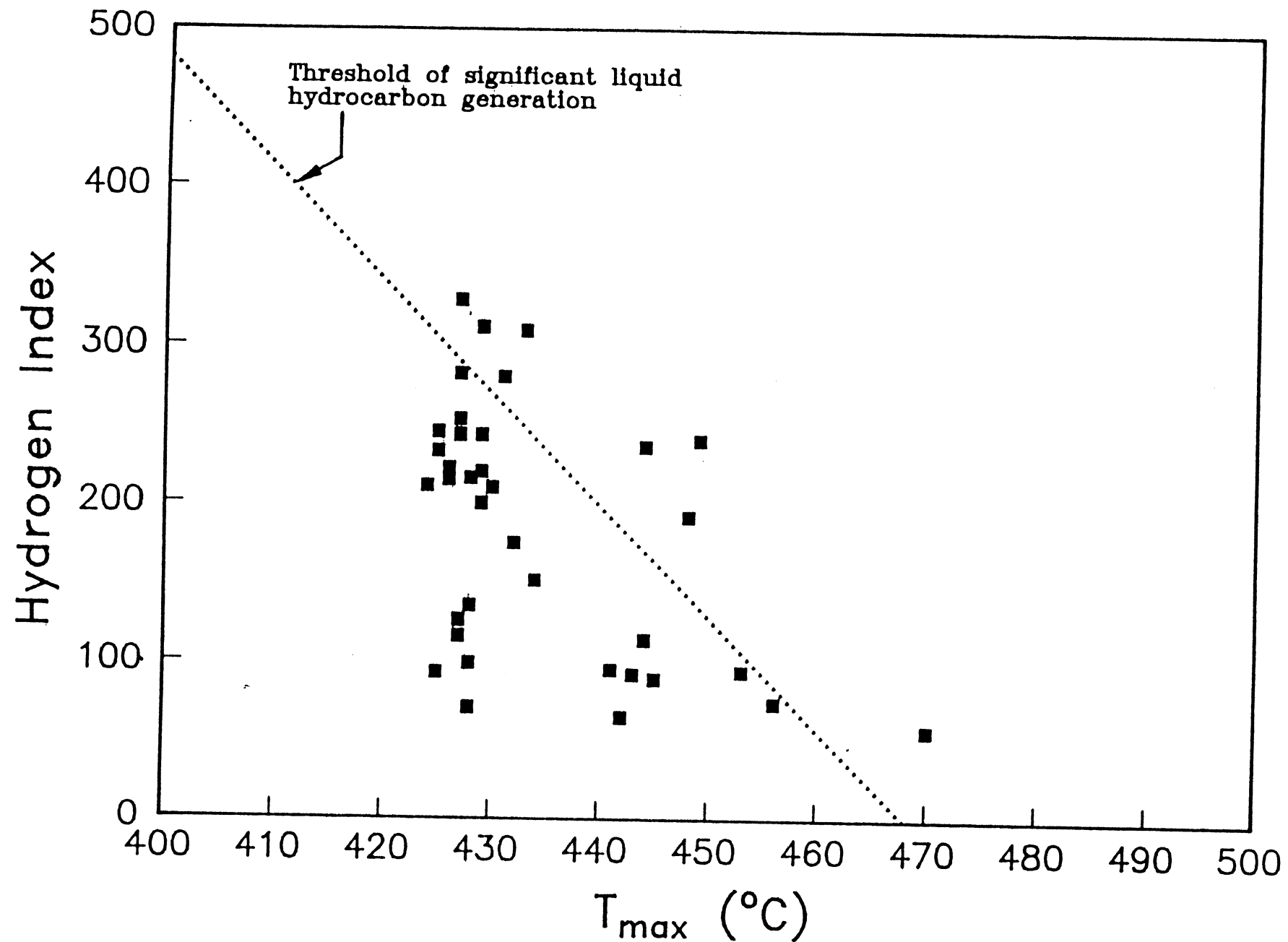


FIGURE 4

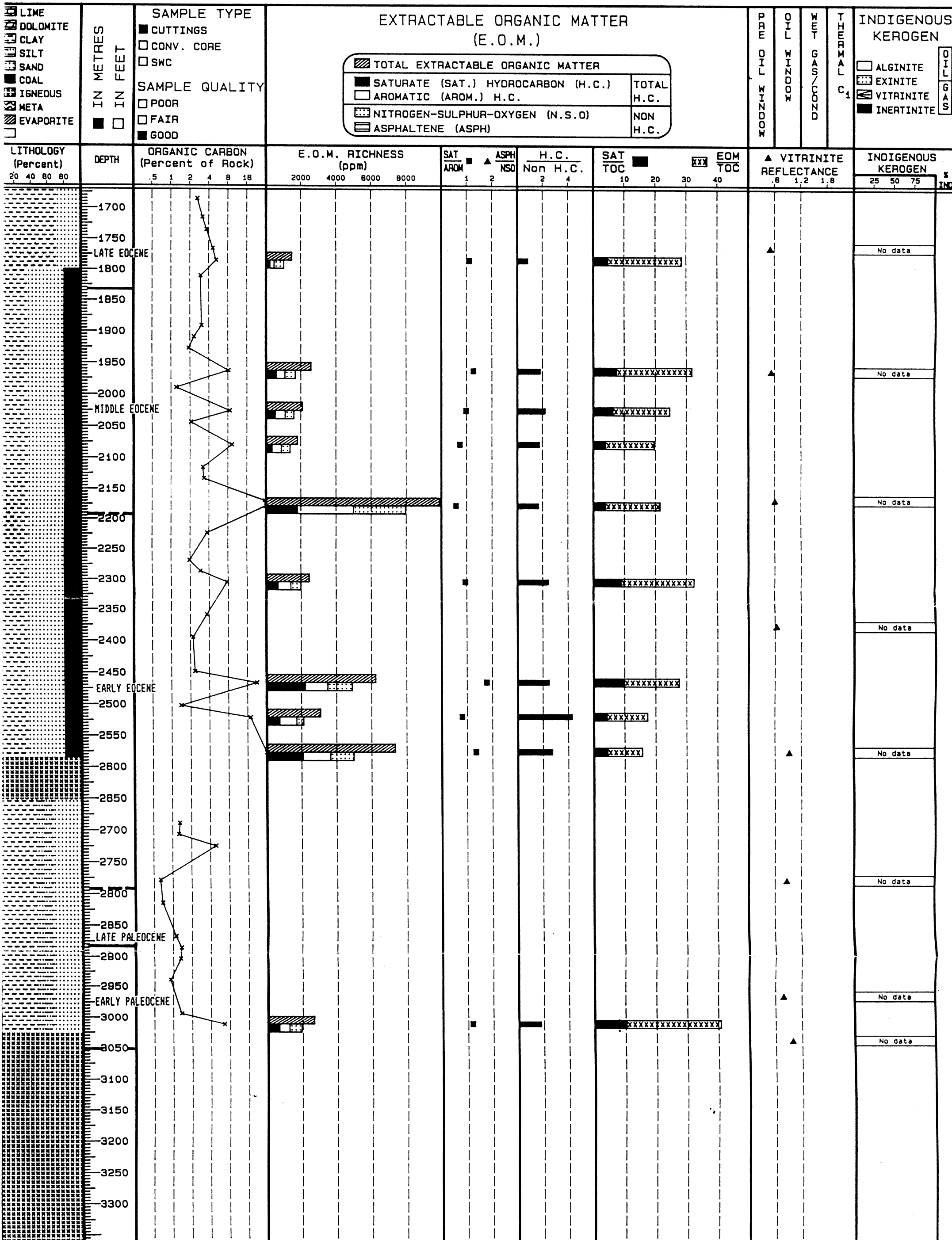
JANUARY 1986

ANA-LOG

HYDROCARBON SOURCE ROCK EVALUATION

AMOCO AUSTRALIA PETROLEUM COMPANY

YOLLA 1



ANA-LOG
HYDROCARBON SOURCE ROCK EVALUATION

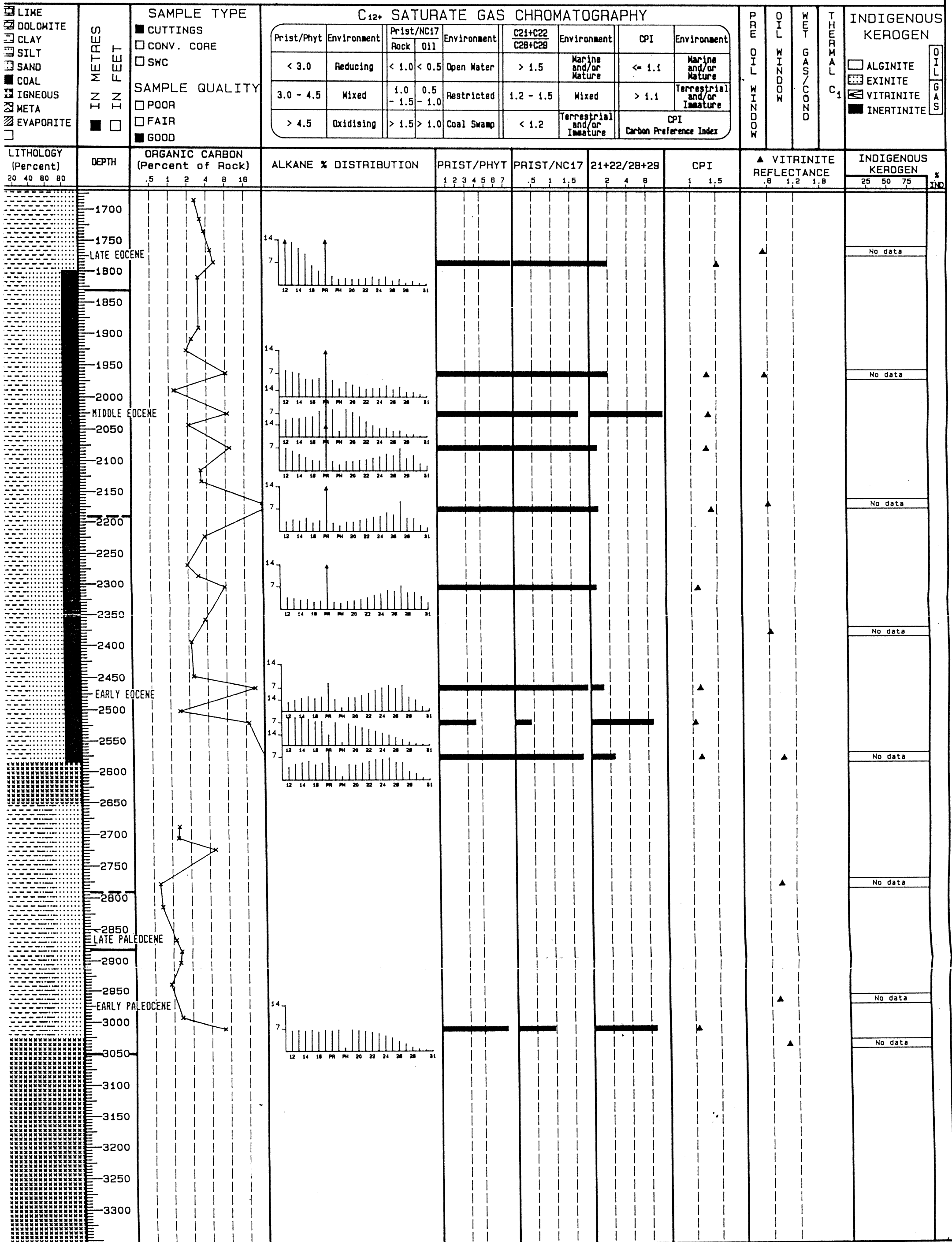
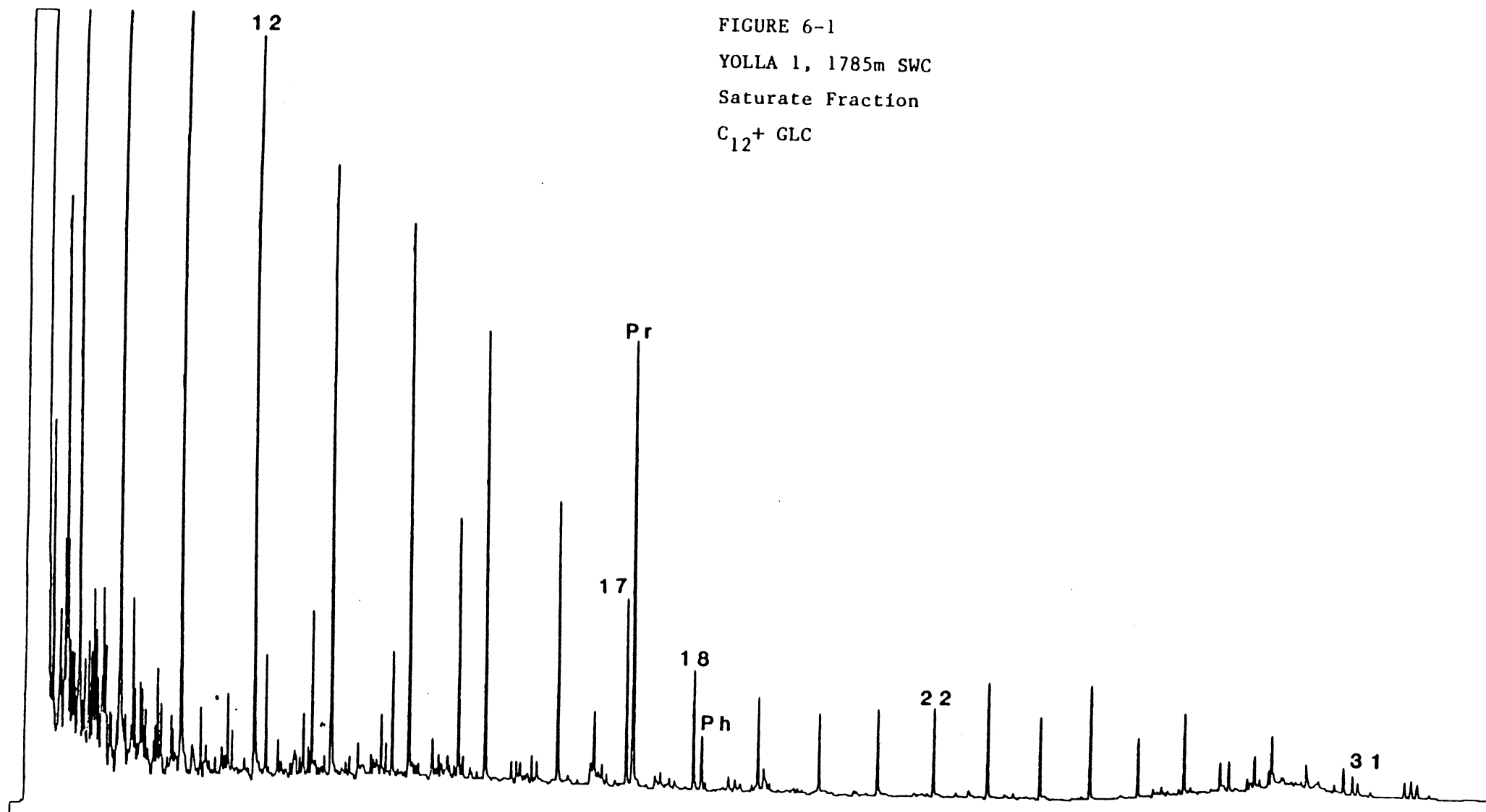


FIGURE 6-1

YOLLA 1, 1785m SWC

Saturate Fraction

C₁₂+ GLC



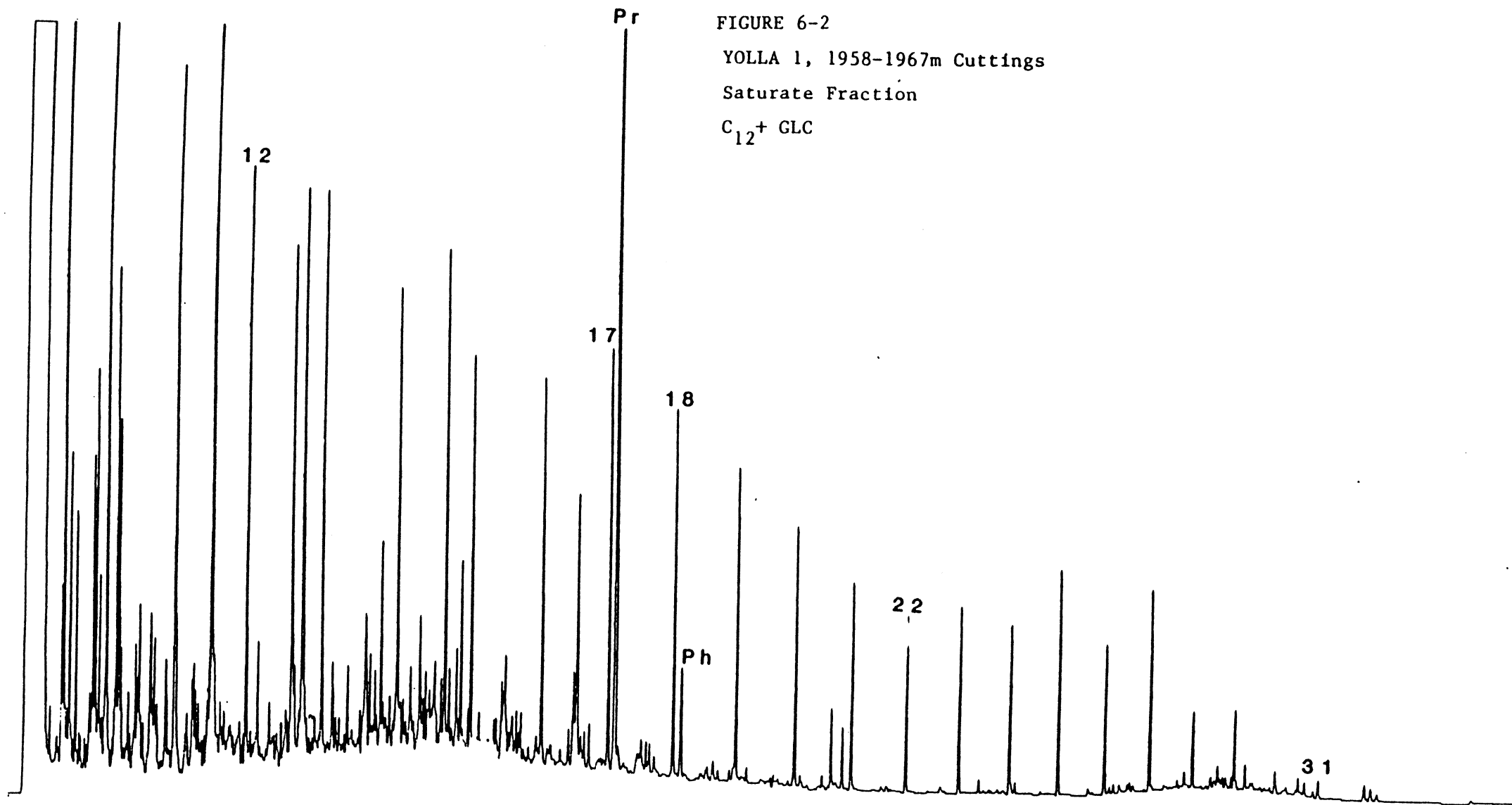


FIGURE 6-2

YOLLA 1, 1958-1967m Cuttings

Saturate Fraction

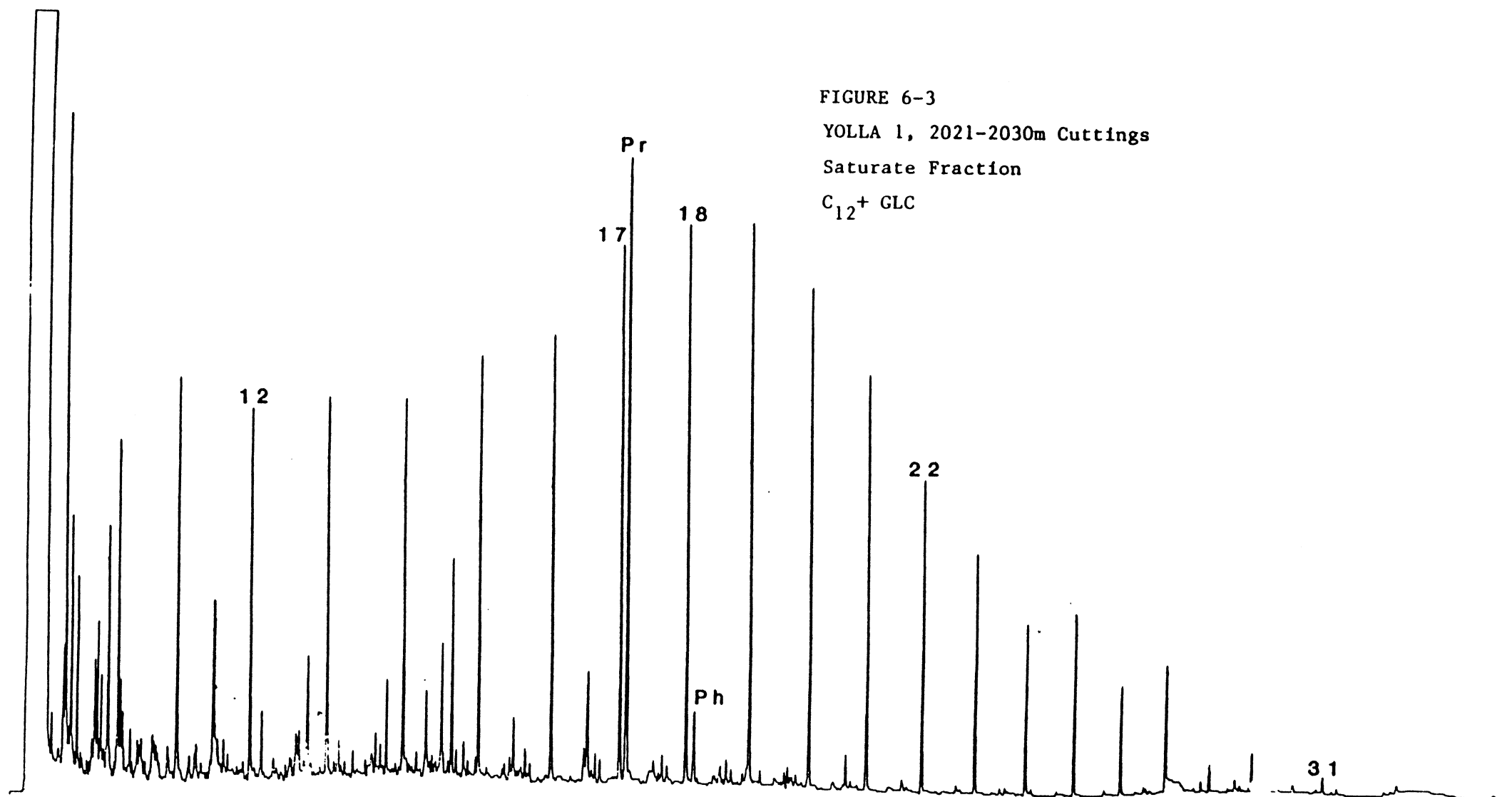
C₁₂⁺ GLC

FIGURE 6-3

YOLLA 1, 2021-2030m Cuttings

Saturate Fraction

C₁₂⁺ GLC



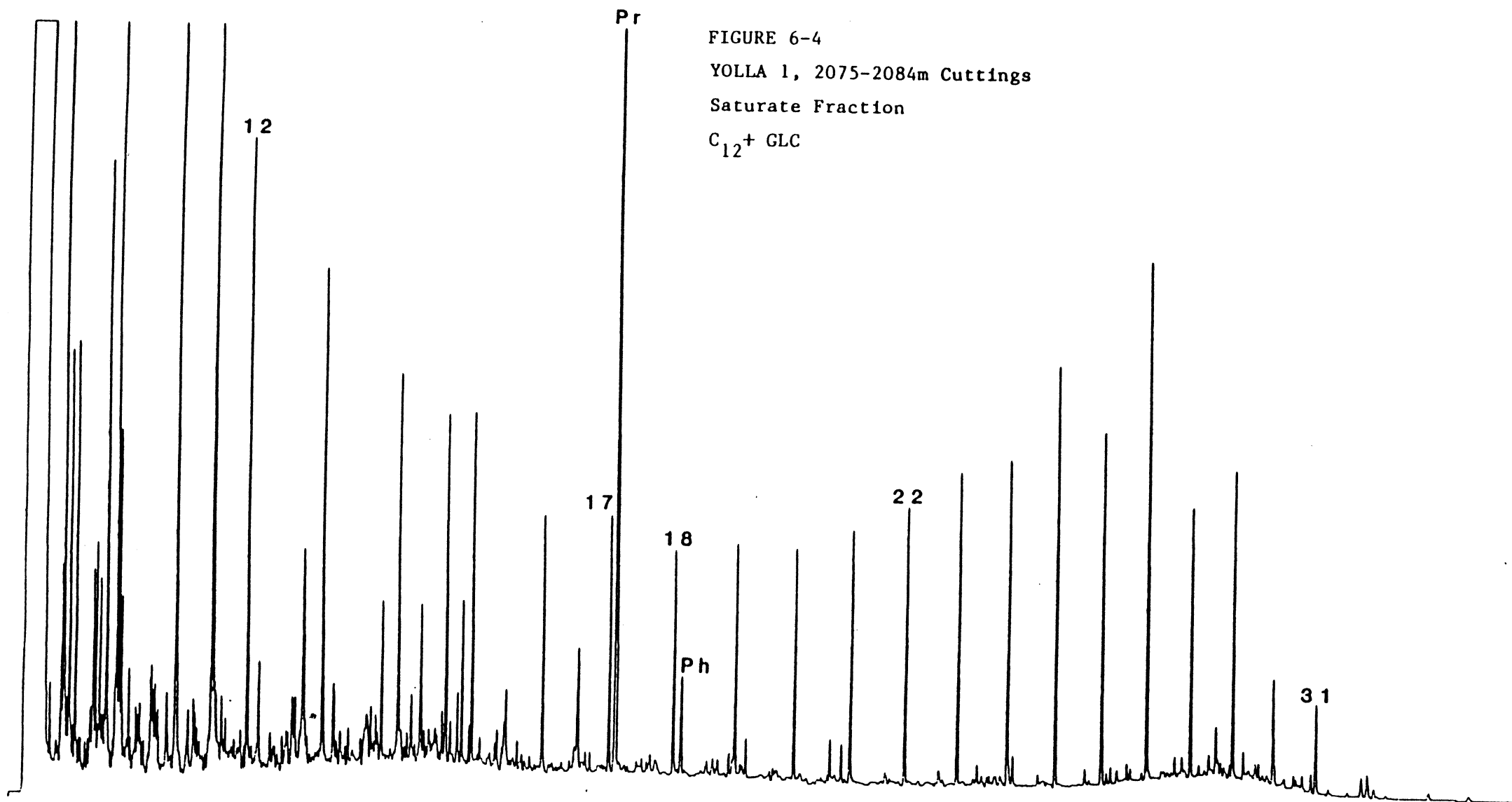


FIGURE 6-4

YOLLA 1, 2075-2084m Cuttings

Saturate Fraction

C₁₂+ GLC

FIGURE 6-5

YOLLA 1, 2174-2183m Cuttings

Saturate Fraction

C₁₂+ GLC

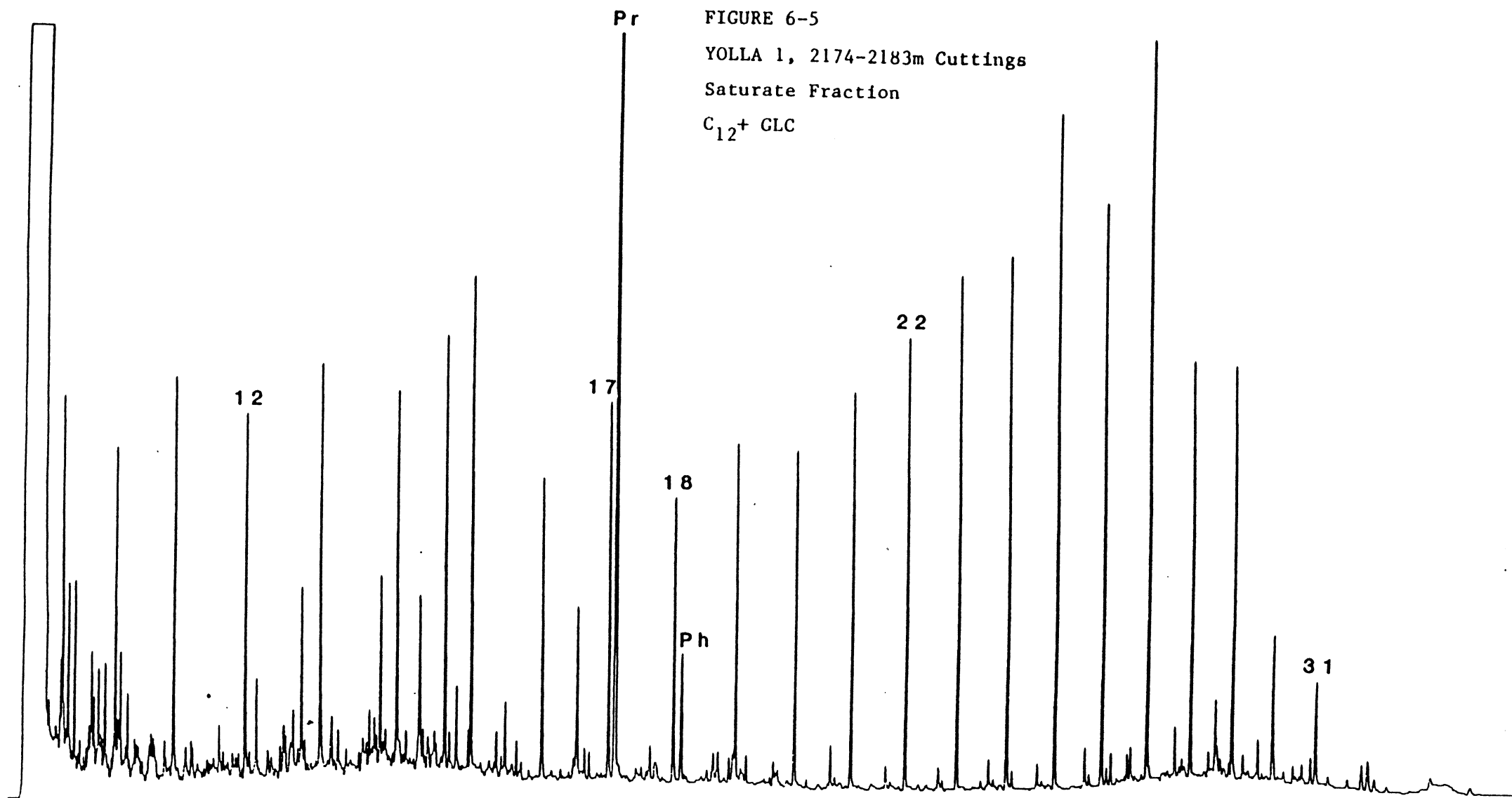


FIGURE 6-6

YOLLA 1, 2300-2309m Cuttings

Saturate Fraction

C₁₂+ GLC

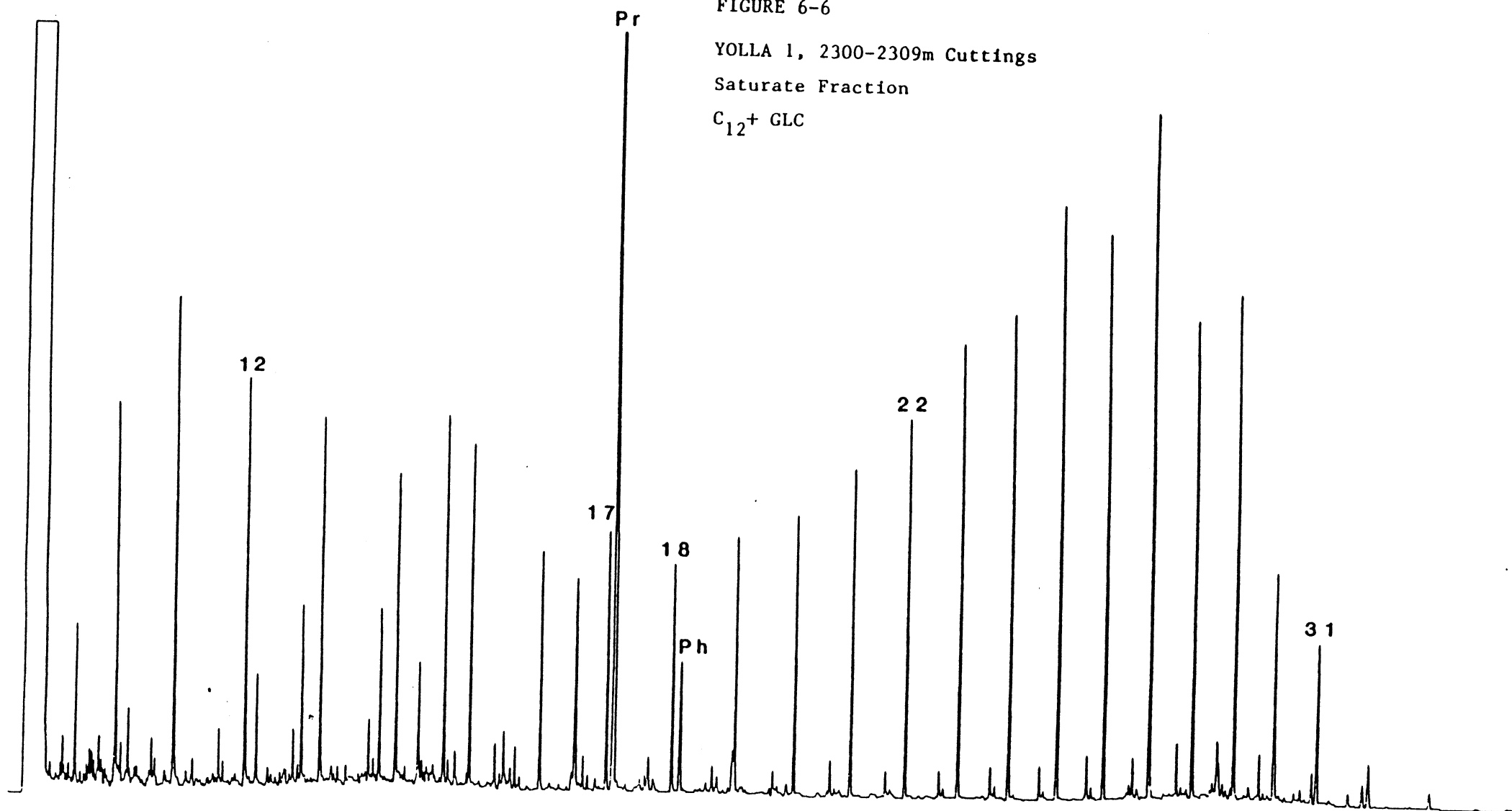


FIGURE 6-7

YOLLA 1, 2462-2471m Cuttings

Saturate Fraction

C₁₂⁺ GLC

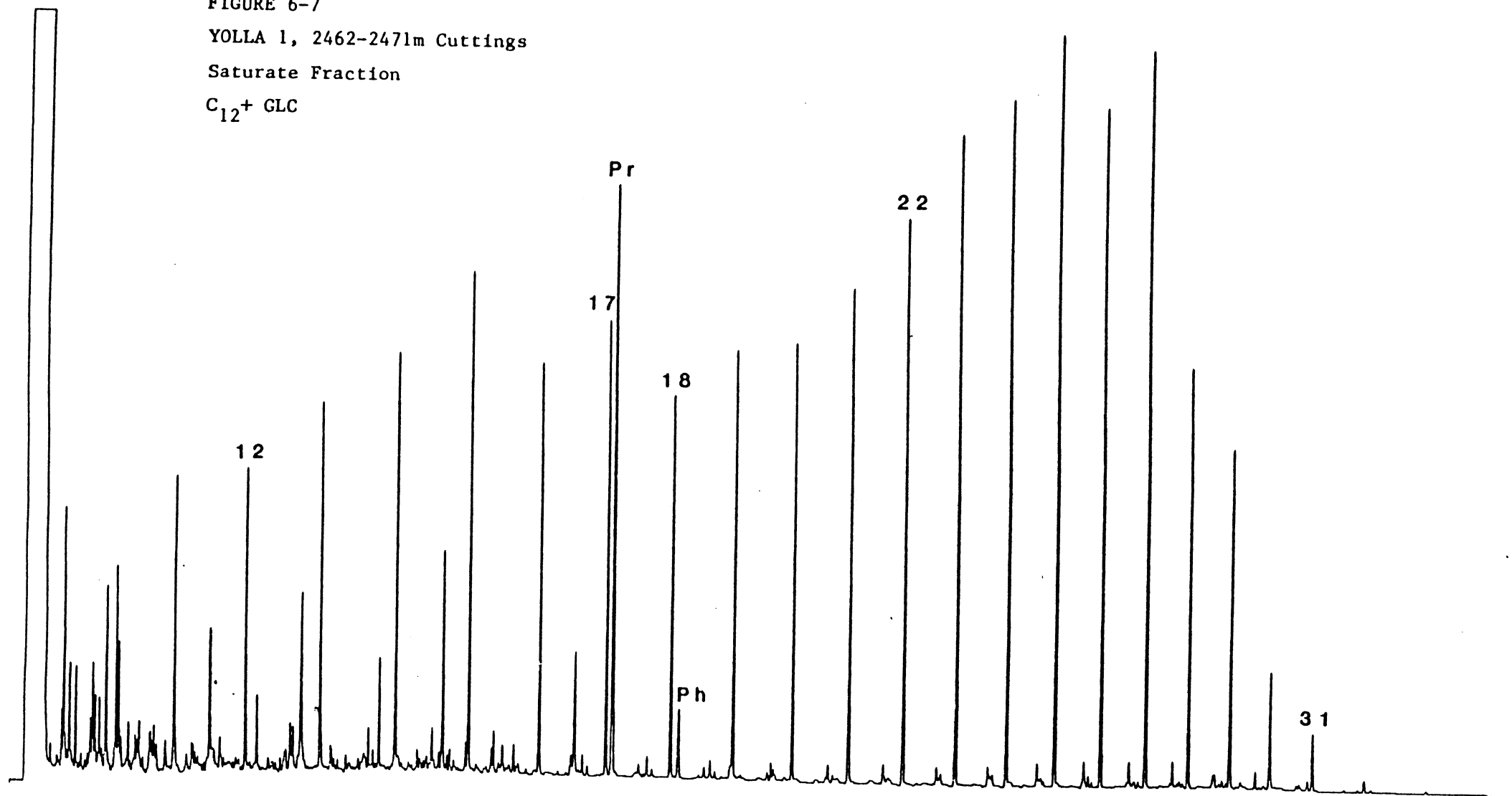


FIGURE 6-8

YOLLA 1, 2517-2526m Cuttings

Saturate Fraction

C₁₂⁺ GLC

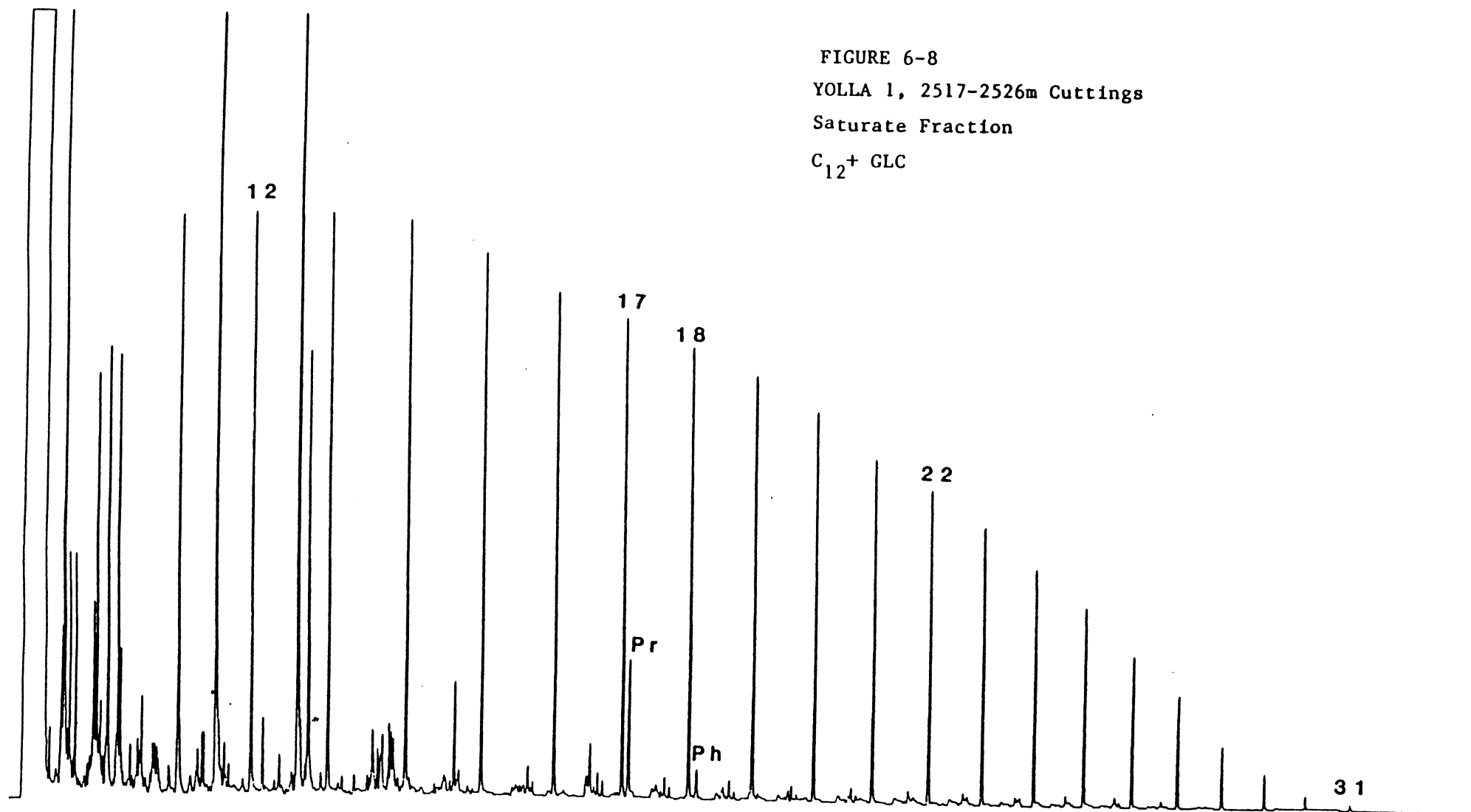


FIGURE 6-9

YOLLA 1, 2573-2582m Cuttings

Saturate Fraction

C₁₂⁺ GLC

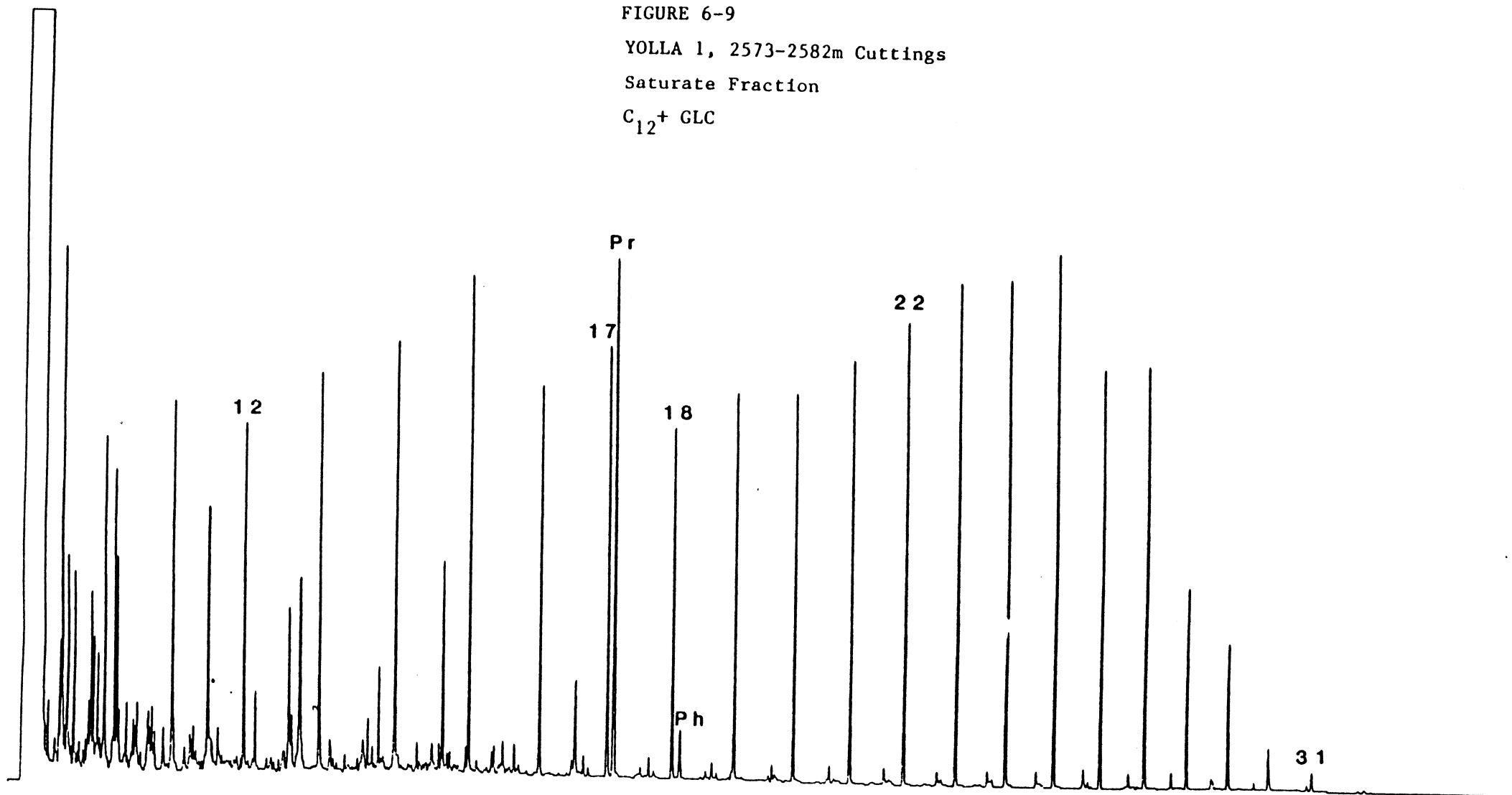


FIGURE 6-10
YOLLA 1, 3007-3016m Cuttings
Saturate Fraction
 C_{12}^+ GLC

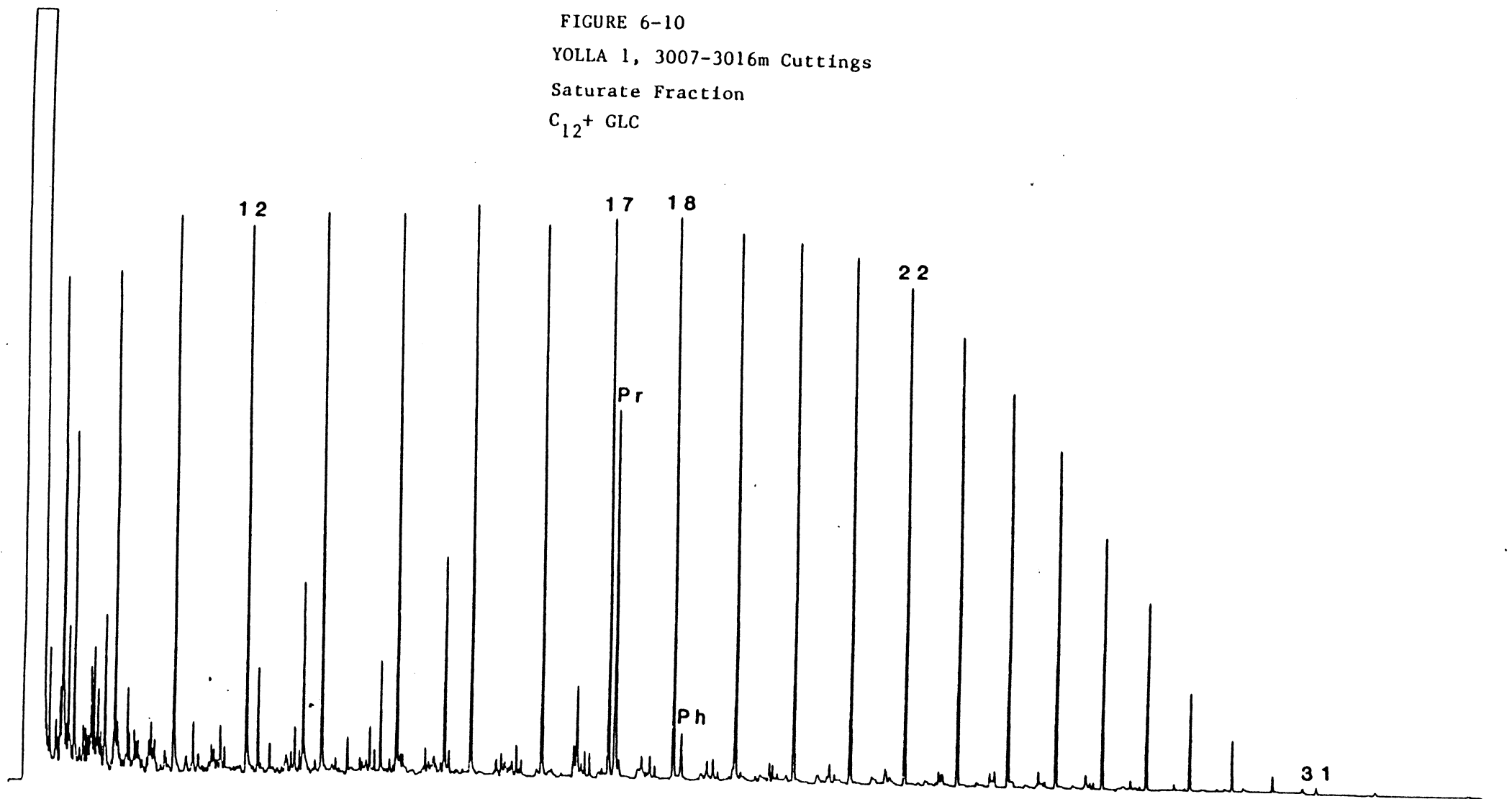


FIGURE 7-1
YOLLA 1, 1785m SWC
Pyrolysis Gas Chromatogram

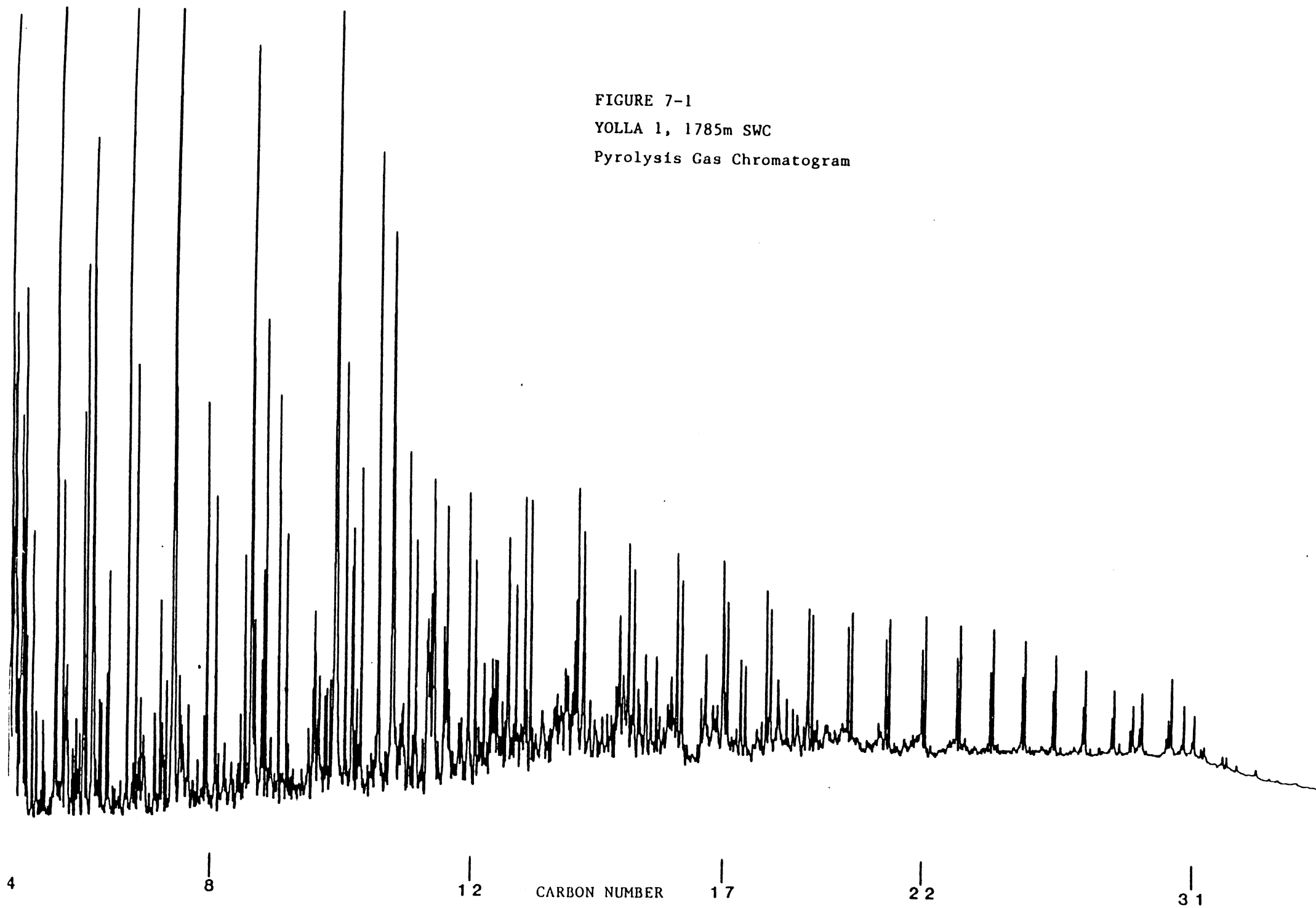


FIGURE 7-2
YOLLA 1, 1958-1967m
Pyrolysis Gas Chromatogram

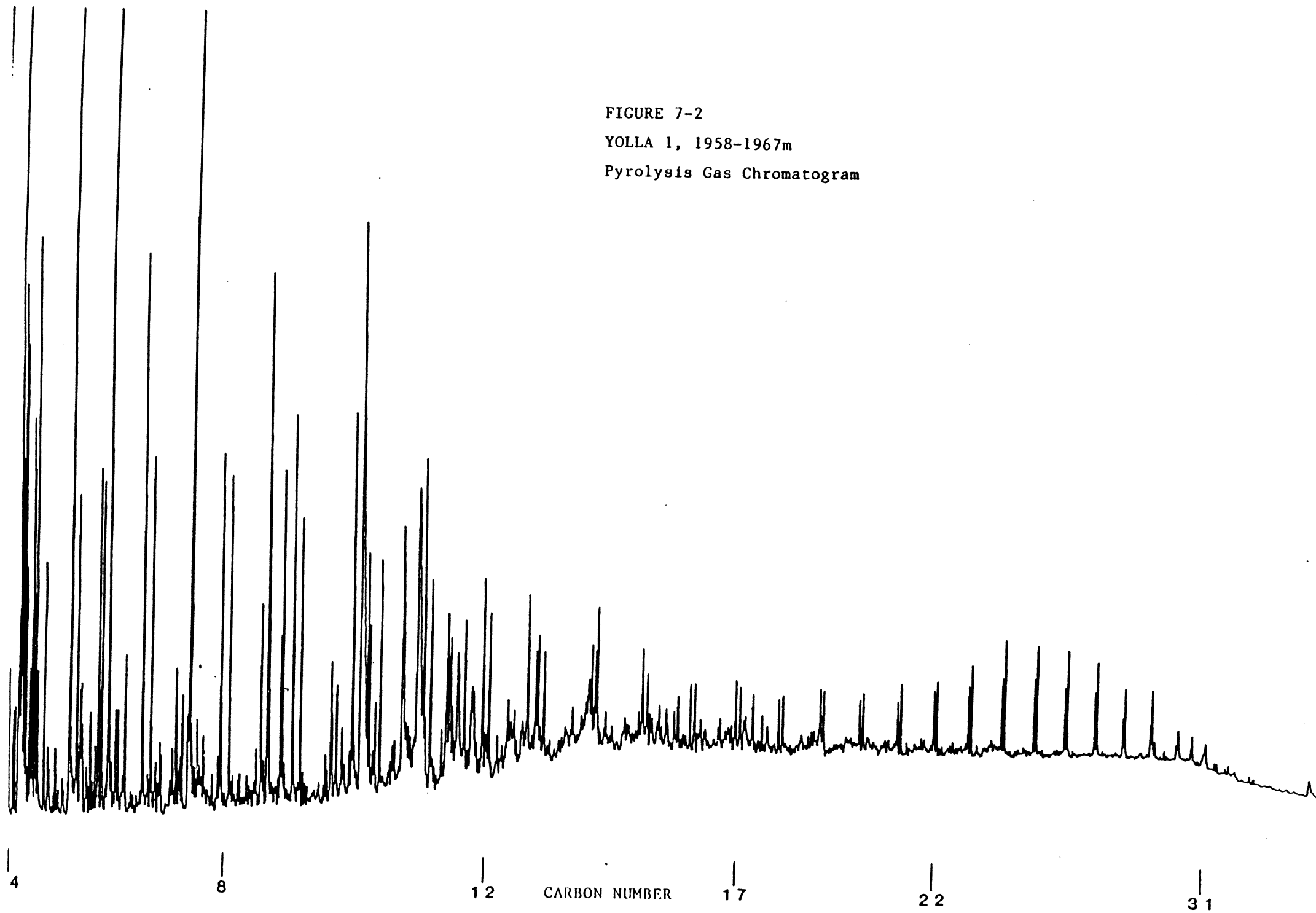


FIGURE 7-3

YOLLA 1, 2021-2030m

Pyrolysis Gas Chromatogram

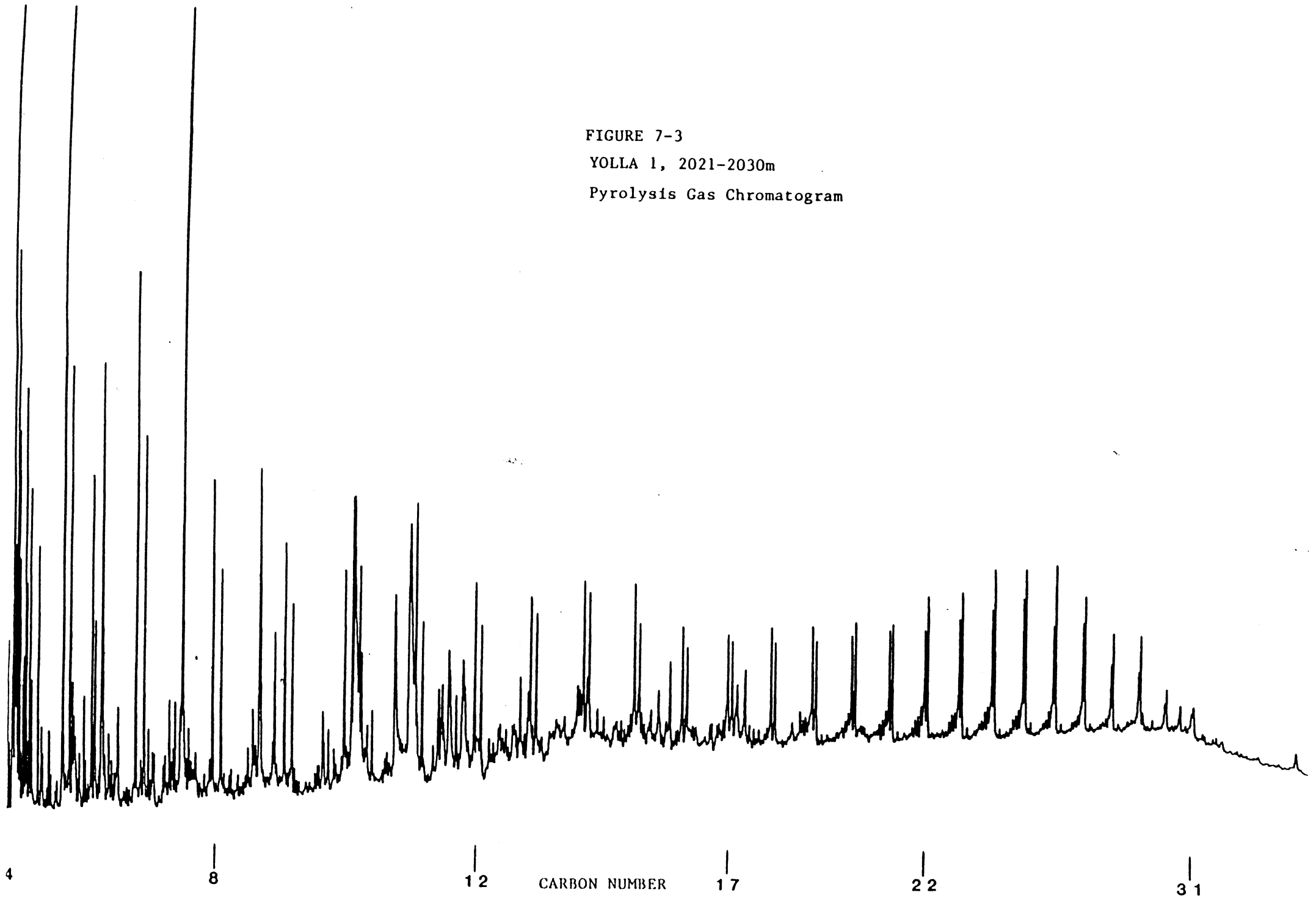


FIGURE 7-4

YOLLA 1, 2075-2084m

Pyrolysis Gas Chromatogram

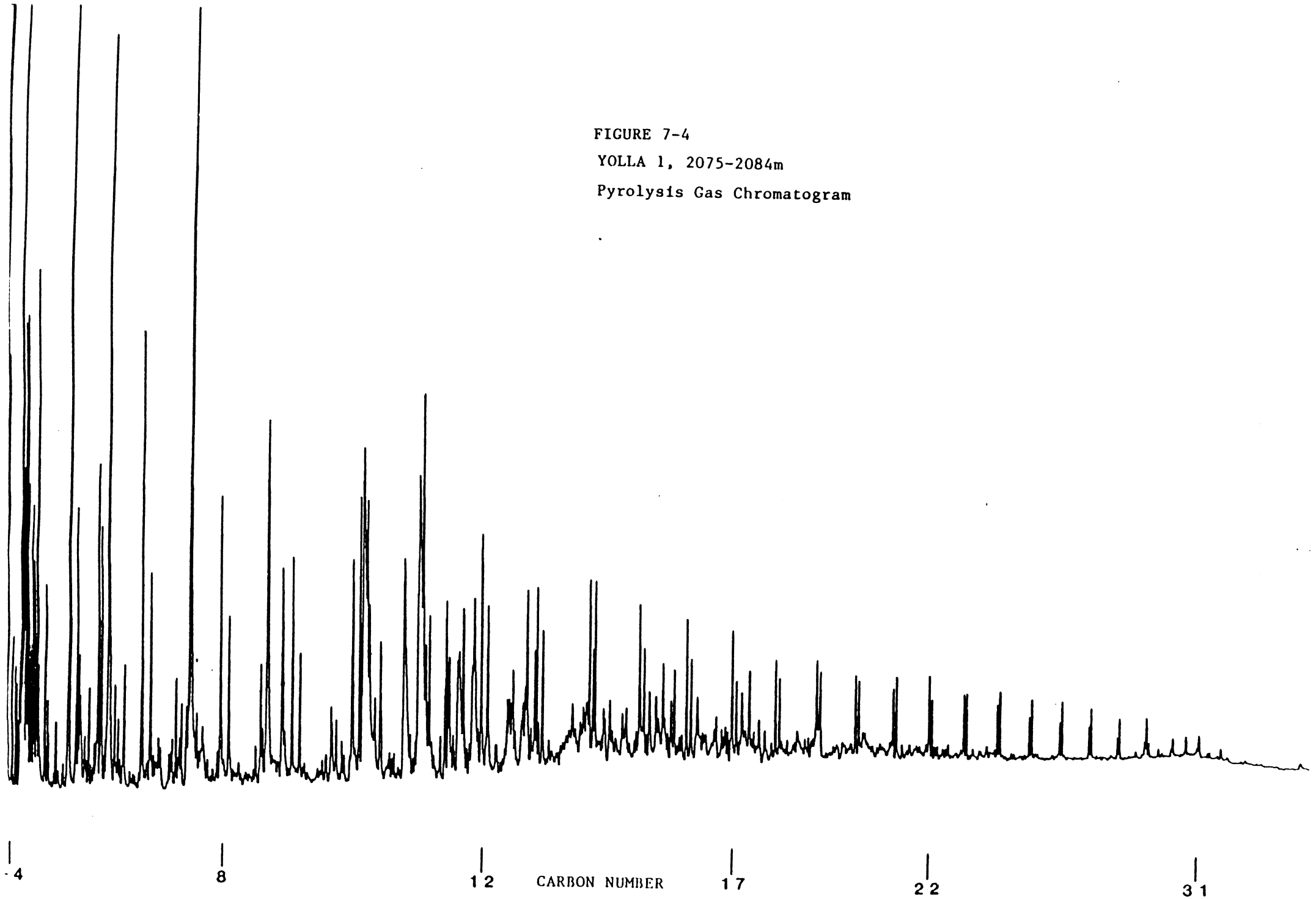


FIGURE 7-5

YOLLA 1, 2174-2183m

Pyrolysis Gas Chromatogram

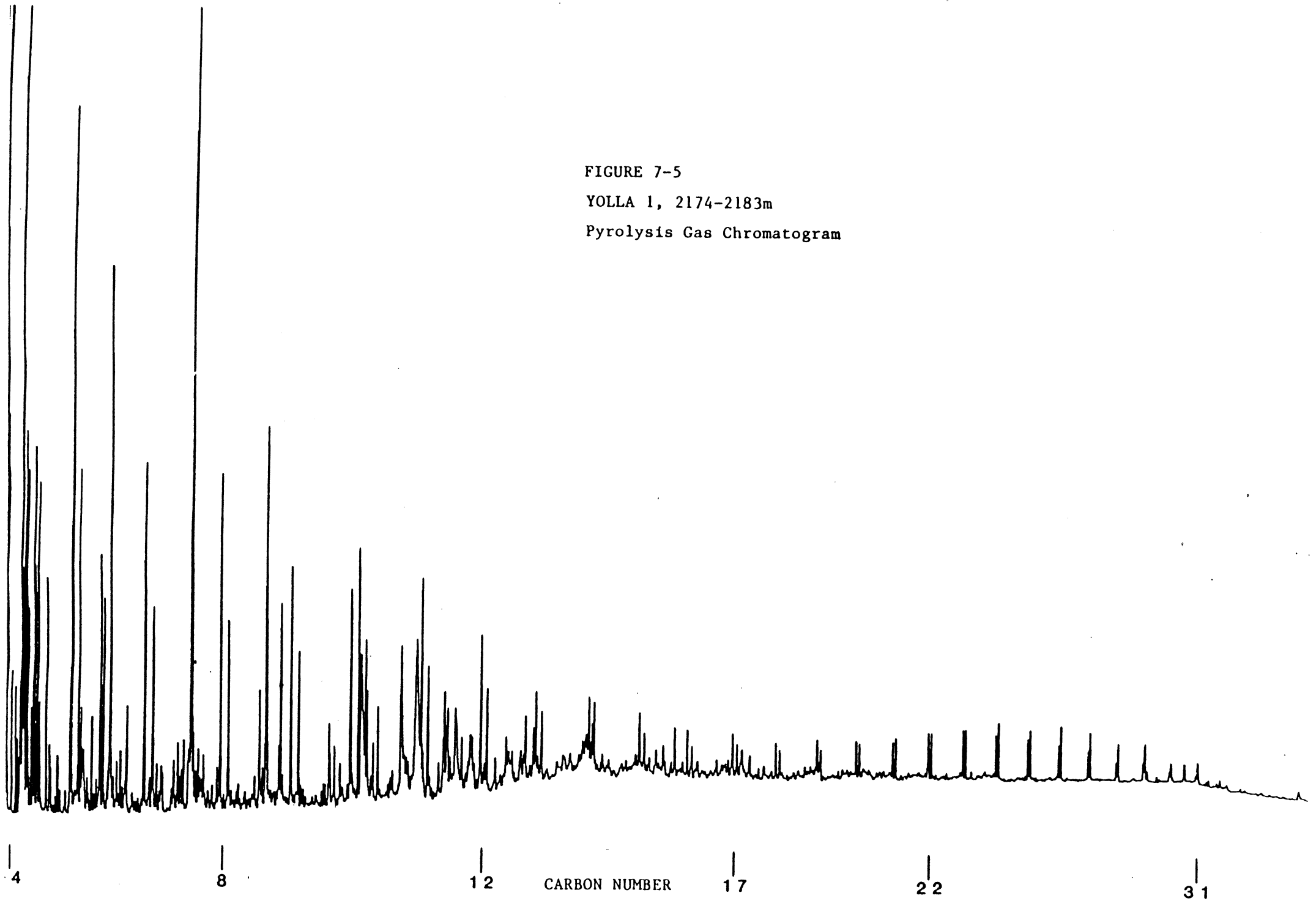


FIGURE 7-6

YOLLA 1, 2300-2309m

Pyrolysis Gas Chromatogram

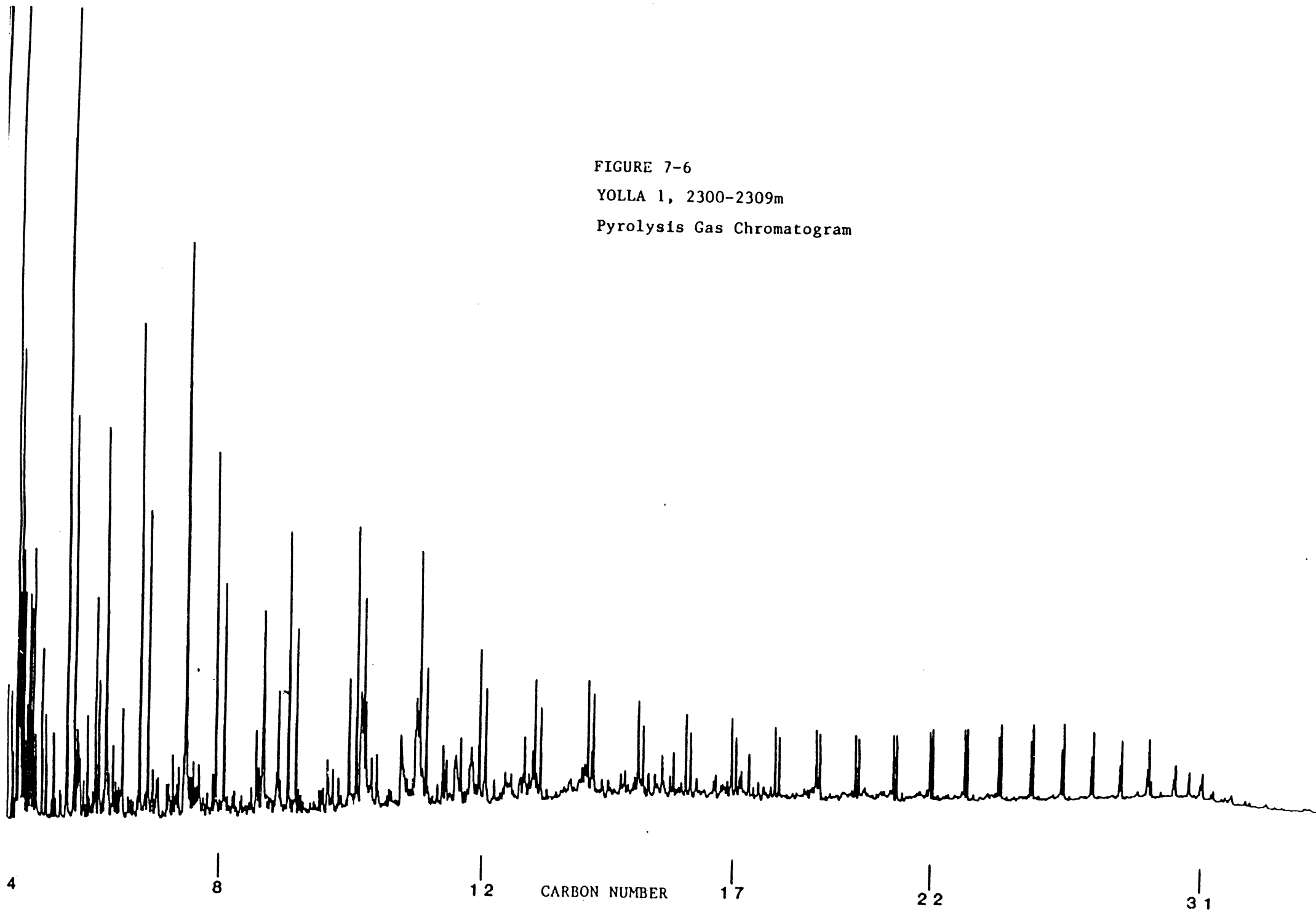
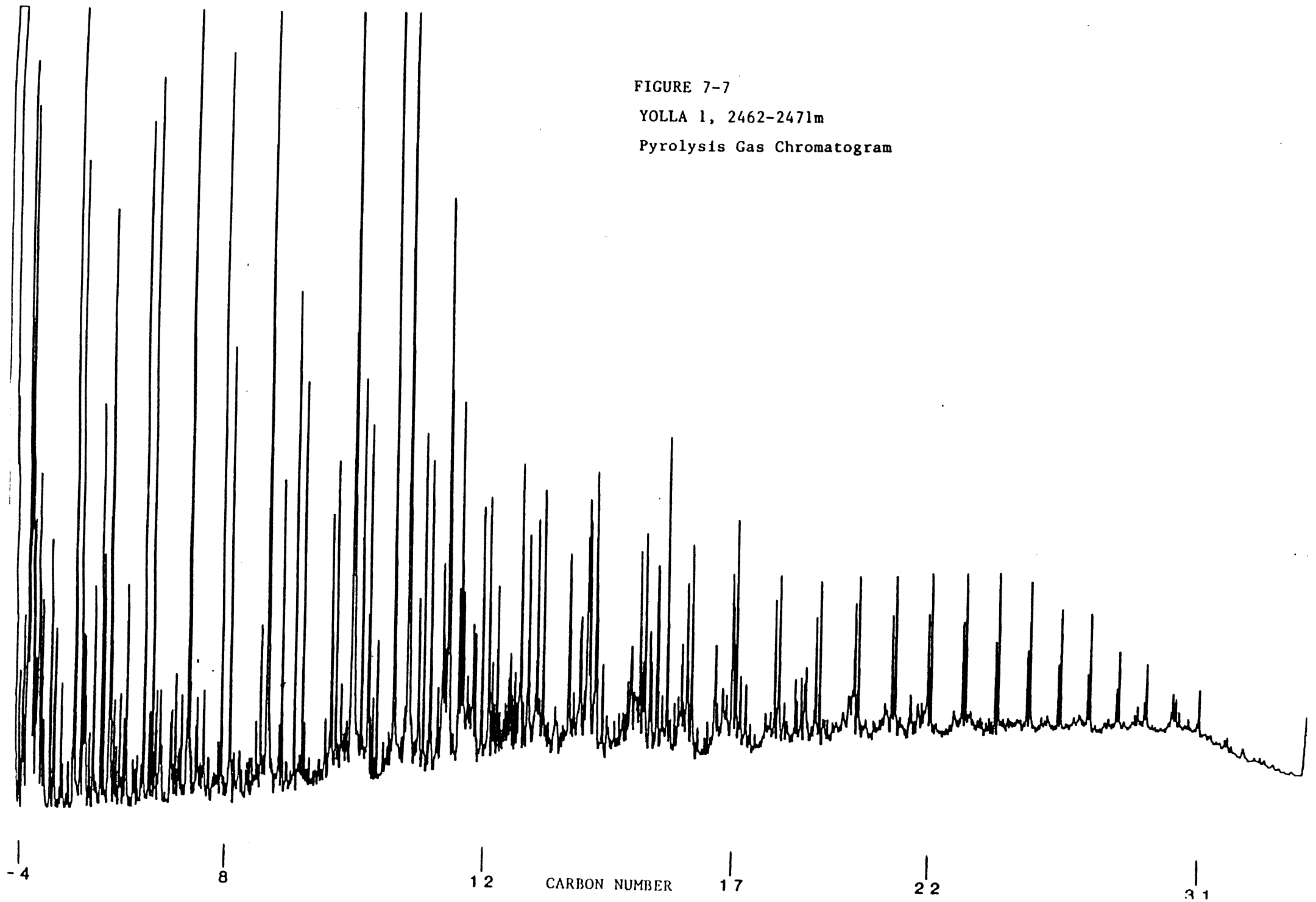


FIGURE 7-7

YOLLA 1, 2462-2471m

Pyrolysis Gas Chromatogram



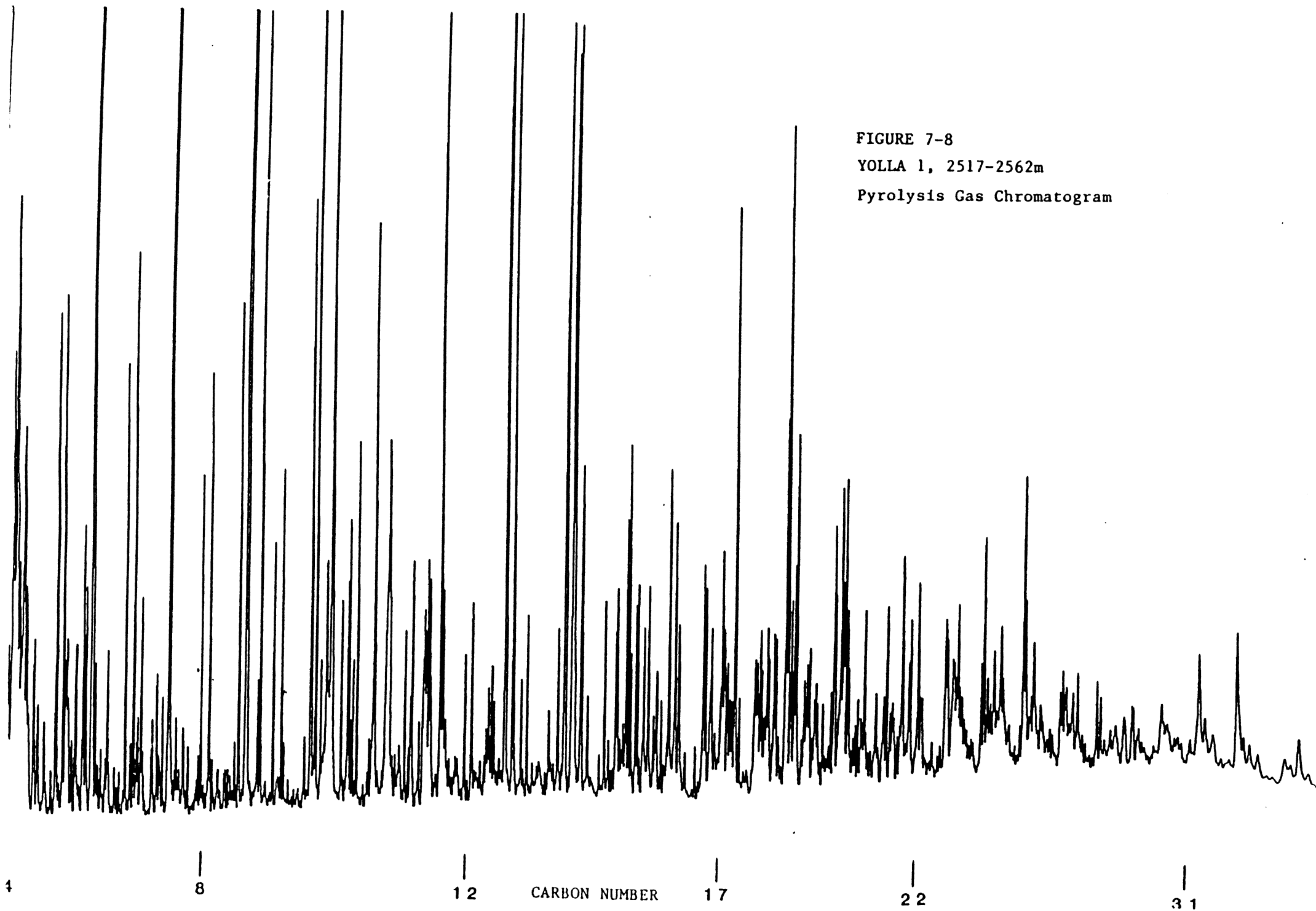


FIGURE 7-8
YOLLA 1, 2517-2562m
Pyrolysis Gas Chromatogram

FIGURE 7-9

YOLLA 1, 2573-2582m

Pyrolysis Gas Chromatogram

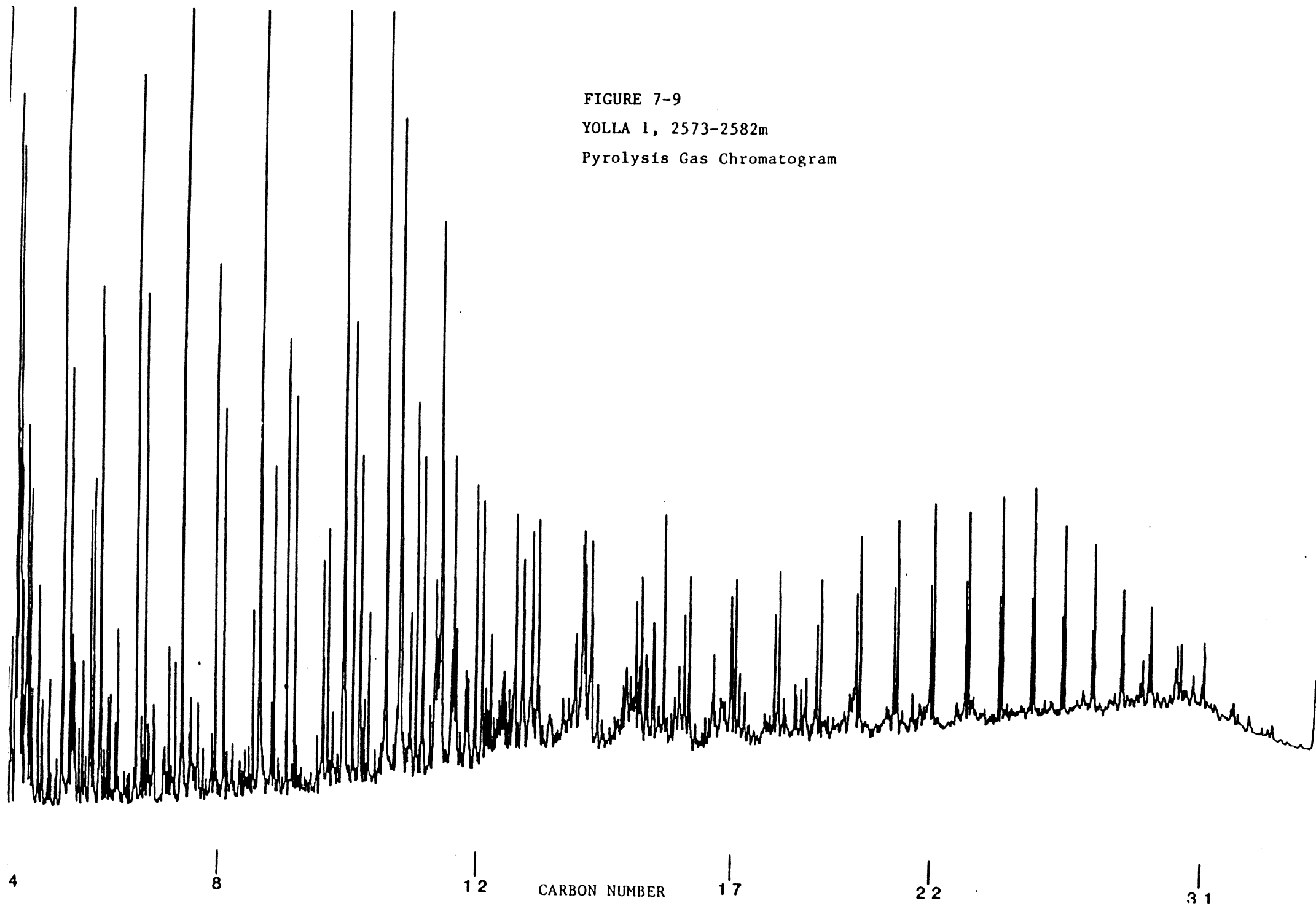


FIGURE 7-10

YOLLA 1, 3007-3016m

Pyrolysis Gas Chromatogram

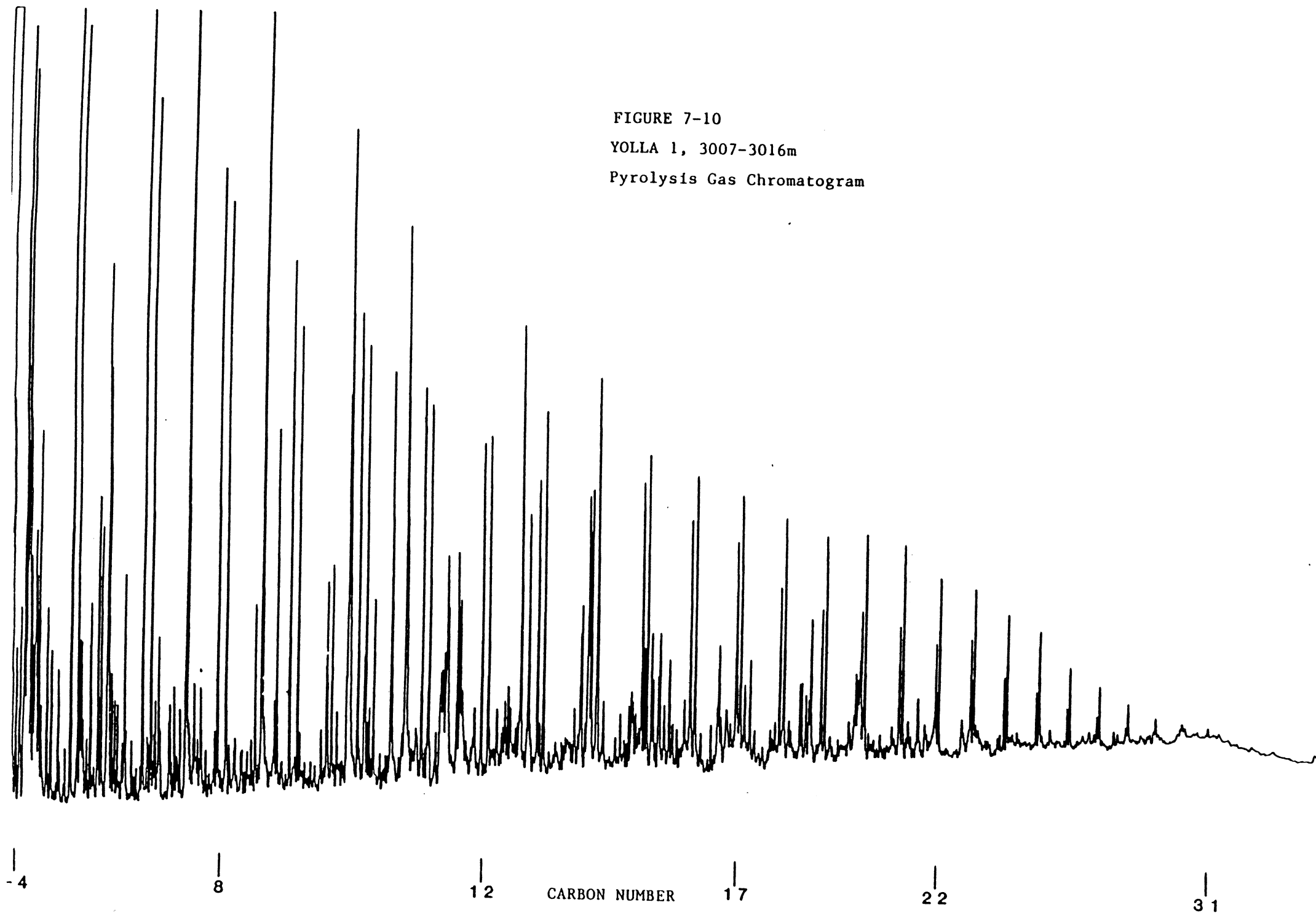
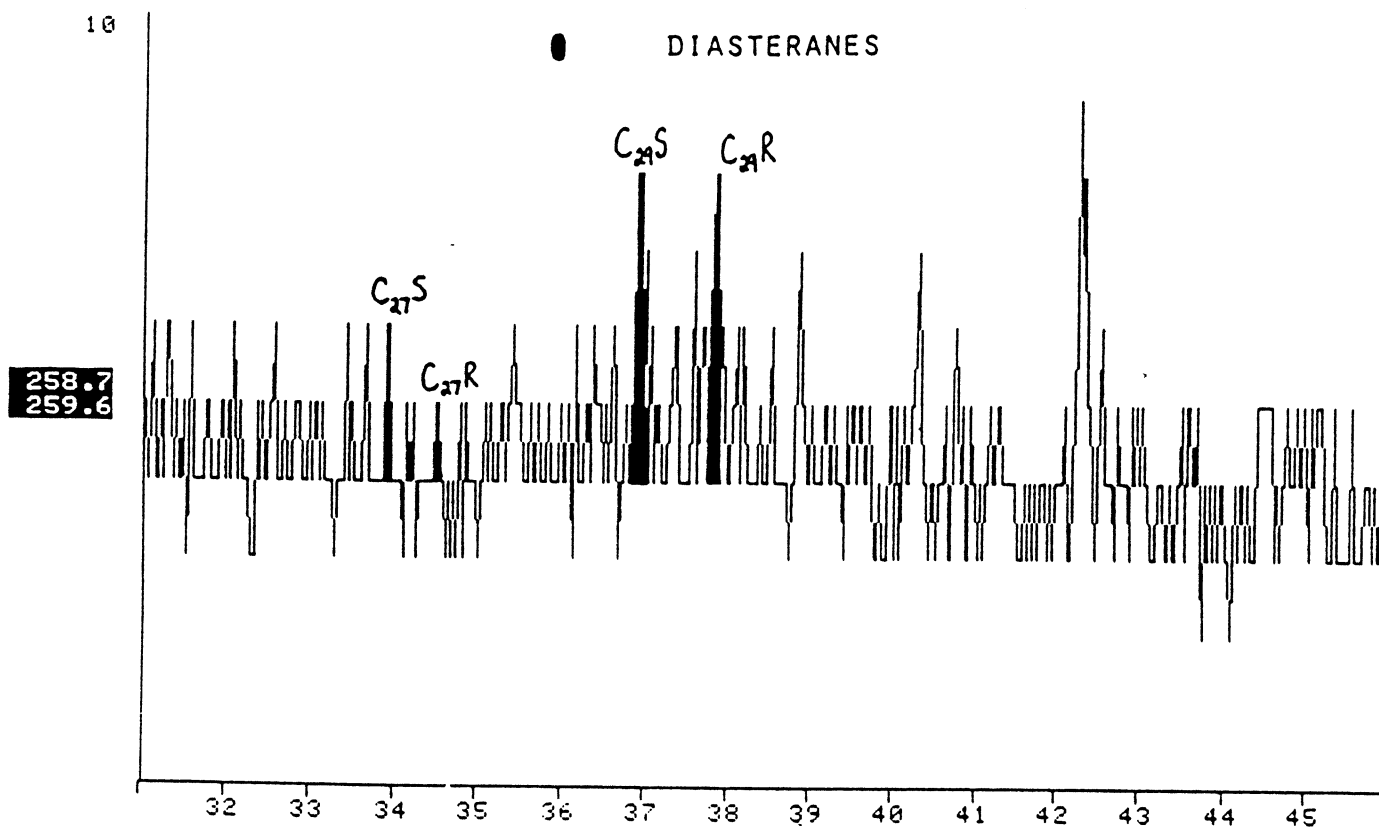


FIGURE 8-1

NAME YOLLA#1, 3007-3016m. BRANCHED CYCLIC FRAGMENTOGRAM.
 MISC 6-1-86. GEC/GW. 0.2ul/50ul. COL#41.

FRN 5882



NAME YOLLA#1, 3007-3016m. BRANCHED CYCLIC FRAGMENTOGRAM.
 MISC 6-1-86. GEC/GW. 0.2ul/50ul. COL#41.

FRN 5882

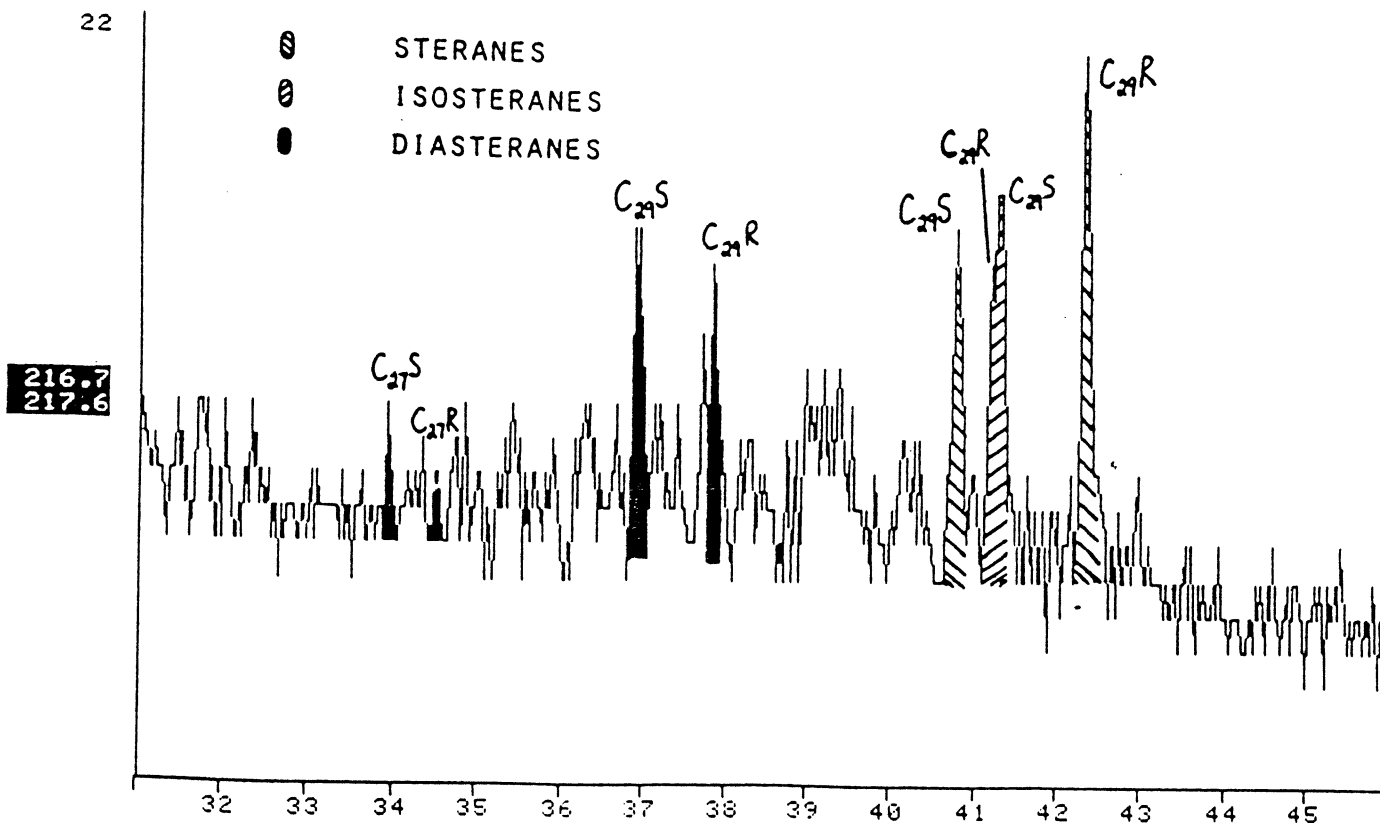
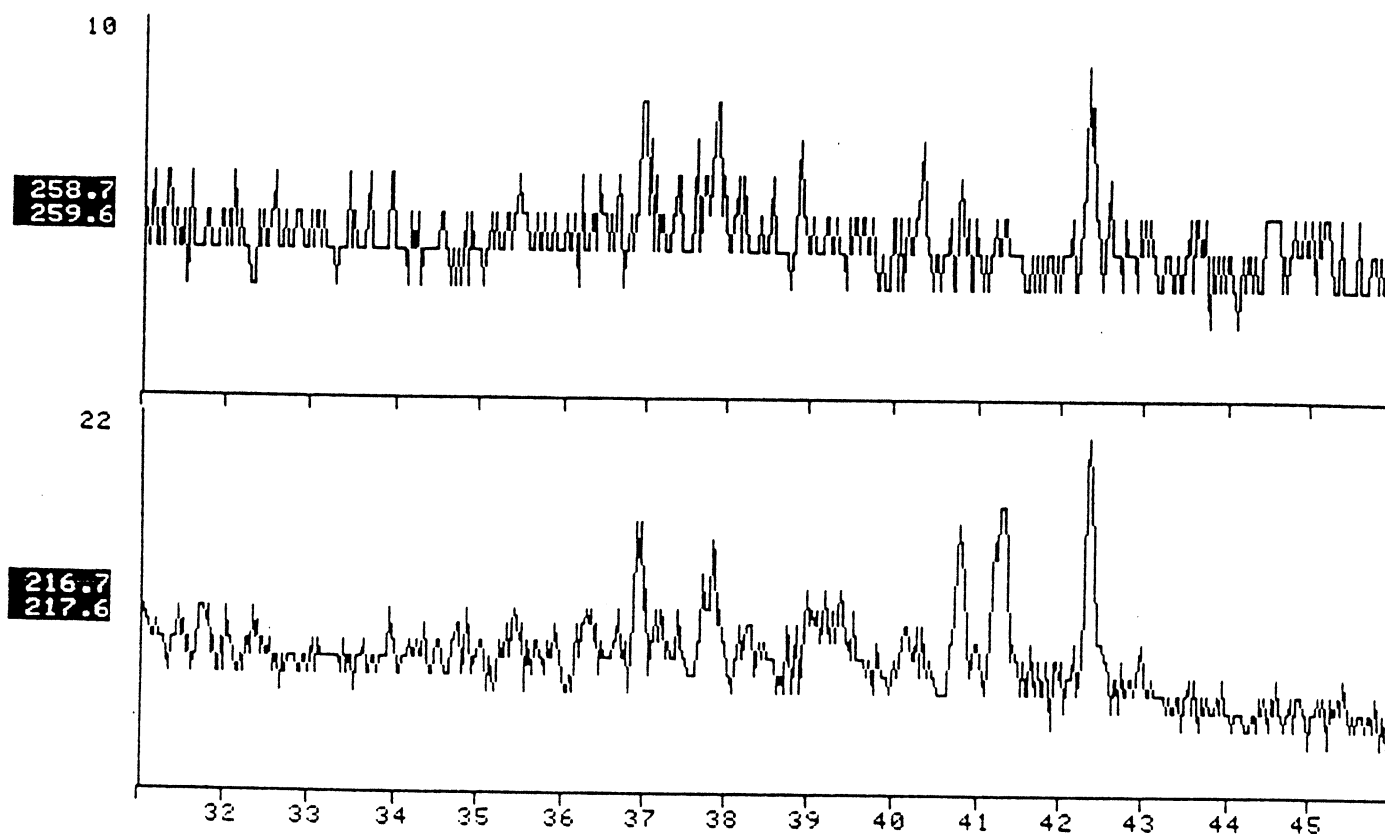


FIGURE 8-2

NAME YOLLA#1, 3007-3016m. BRANCHED CYCLIC FRAGMENTOGRAM.
MISC 6-1-86. GEC/GW. 0.2ul/50ul. COL#41.

FRN 5882



NAME YOLLA#1, 3007-3016m. BRANCHED CYCLIC FRAGMENTOGRAM.
MISC 6-1-86. GEC/GW. 0.2ul/50ul. COL#41.

FRN 5882

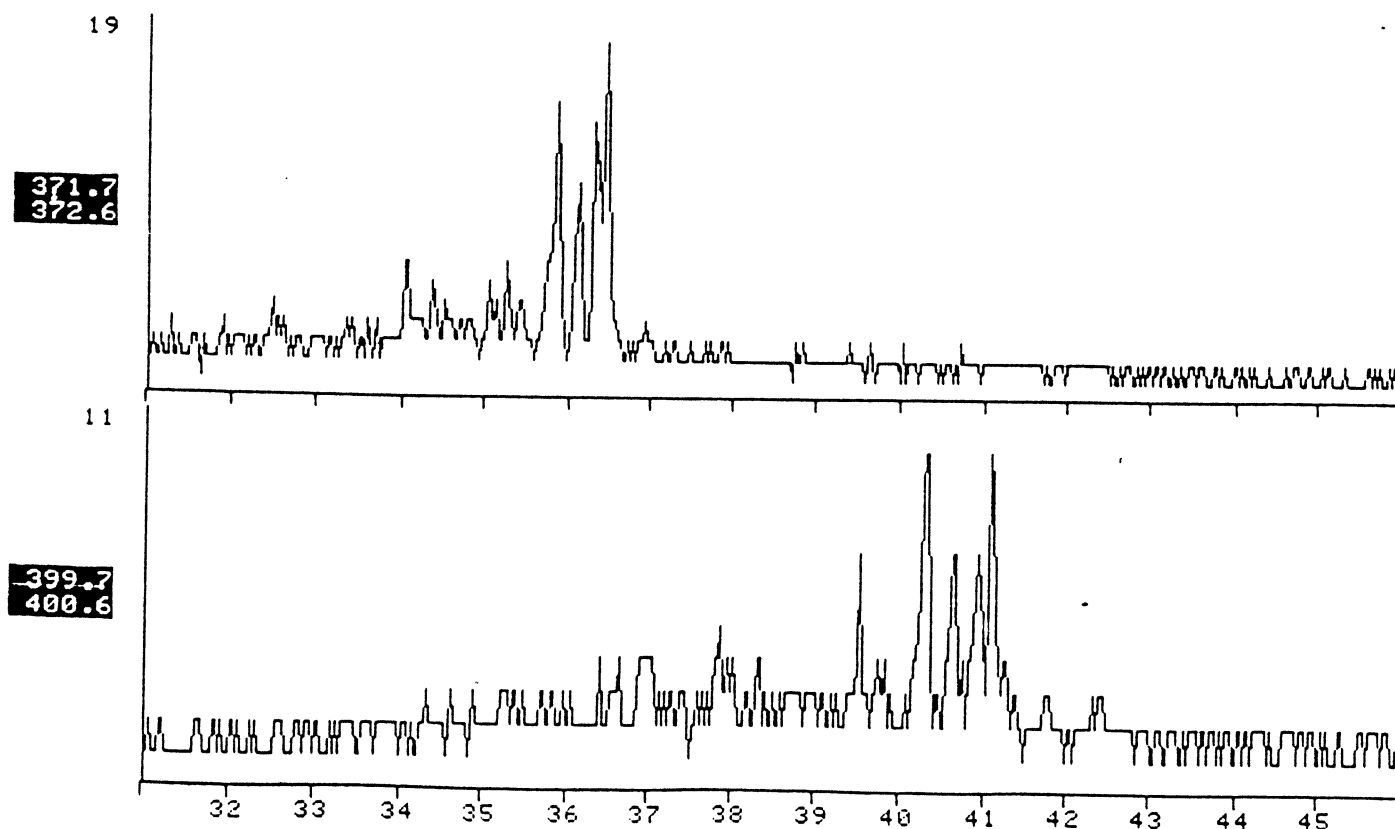
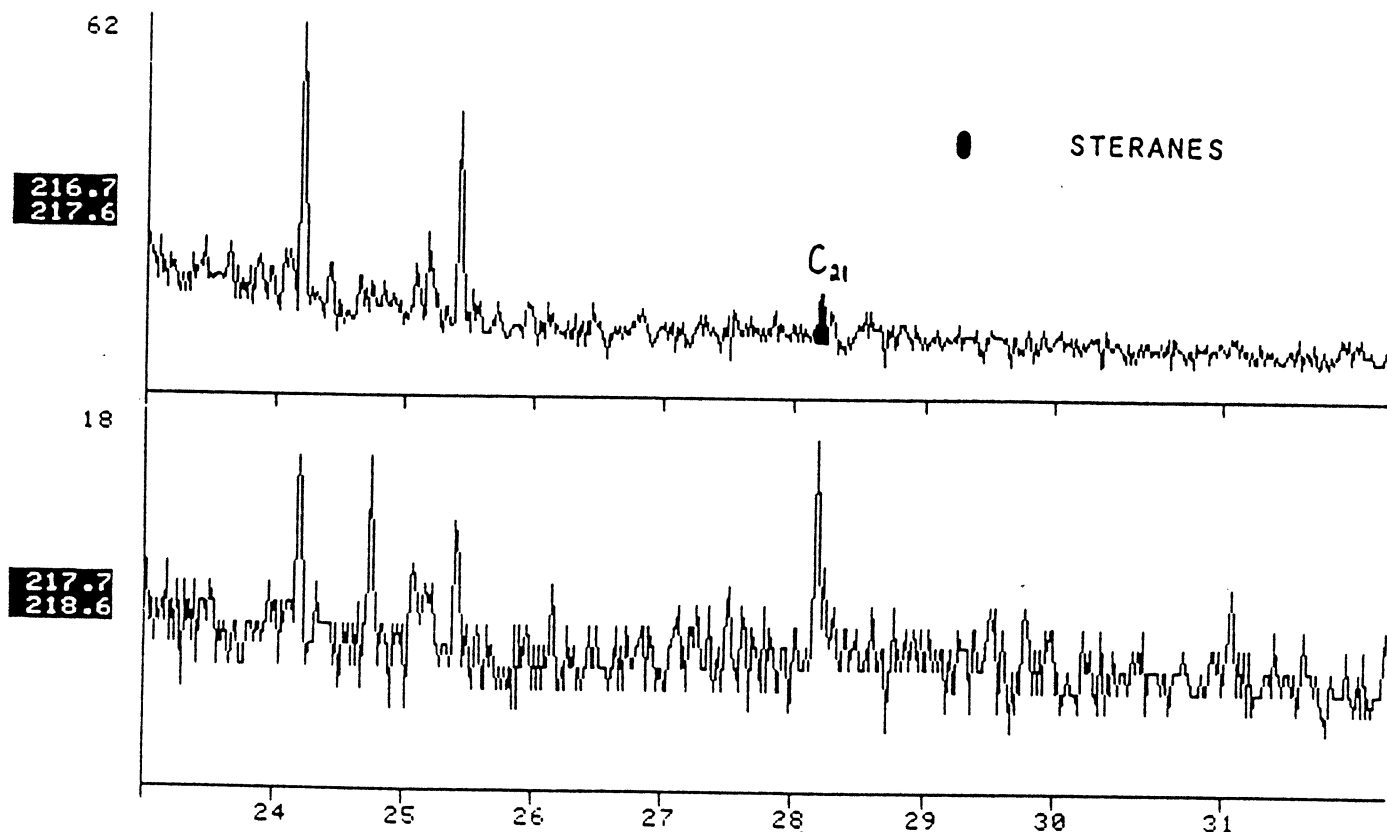


FIGURE 8-3

NAME YOLLA*1, 3007-3016m. BRANCHED CYCLIC FRAGMENTOGRAM.
 MISC 6-1-86. GEC/GW. 0.2ul/50ul. COL#41.

FRN 5882



NAME YOLLA*1, 3007-3016m. BRANCHED CYCLIC FRAGMENTOGRAM.
 MISC 6-1-86. GEC/GW. 0.2ul/50ul. COL#41.

FRN 5882

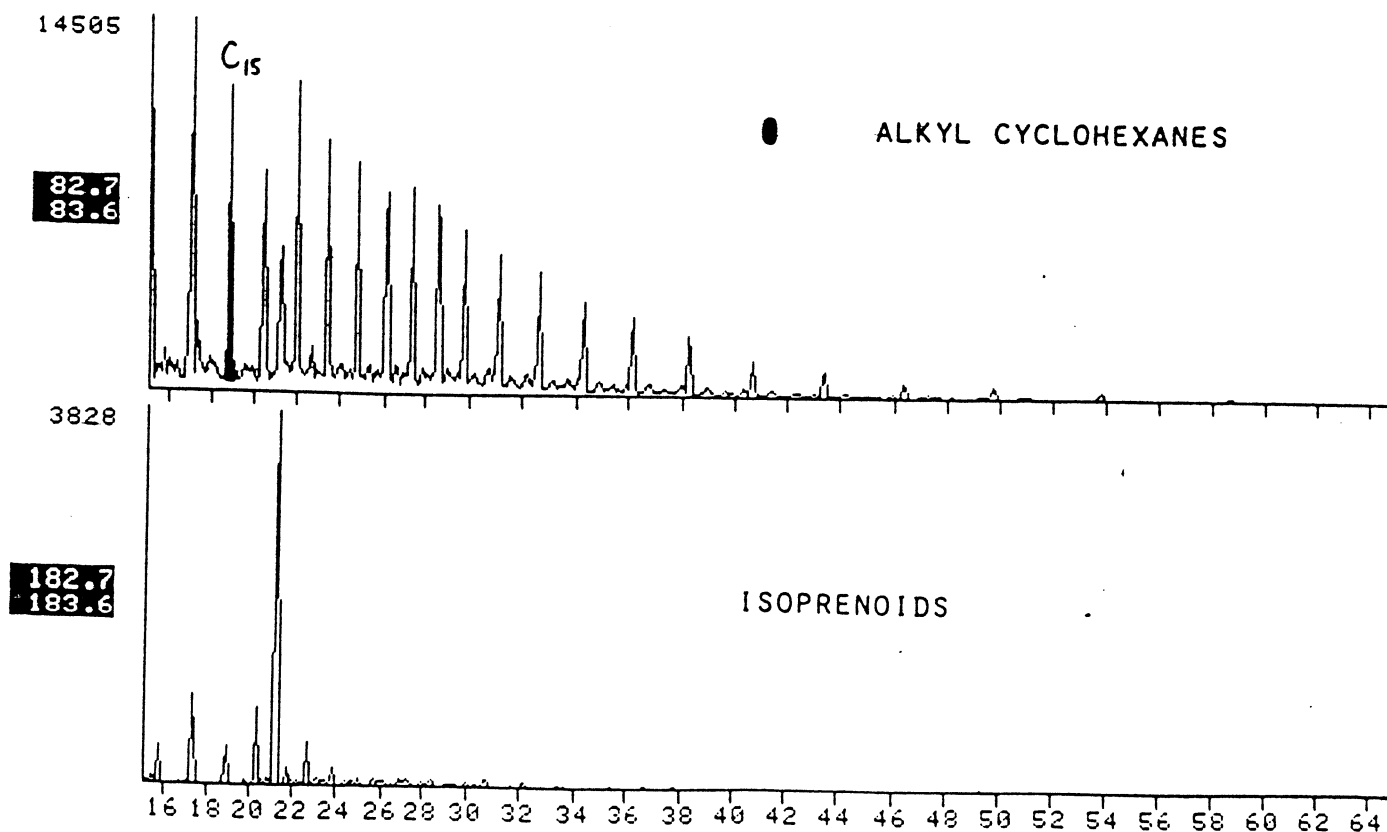
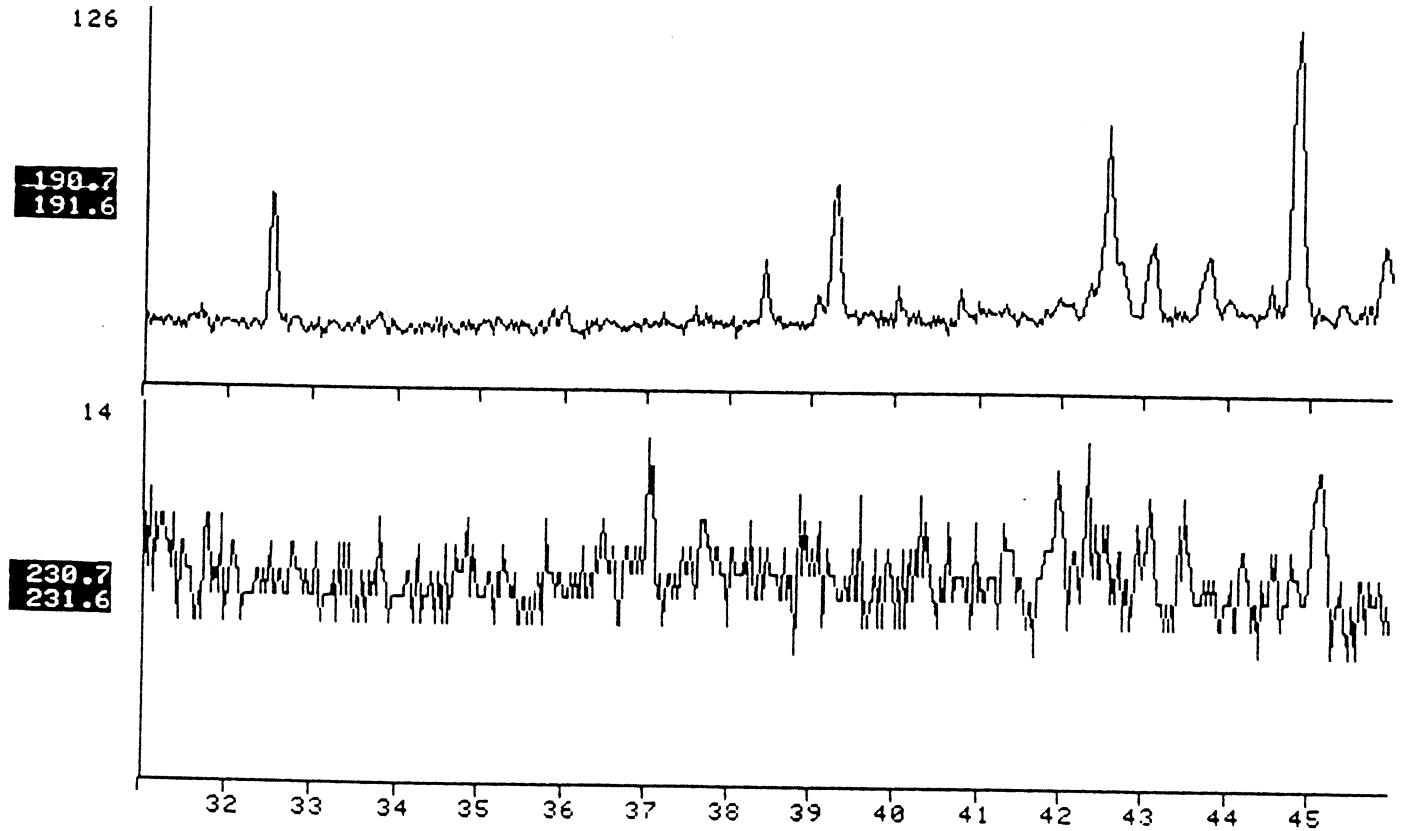


FIGURE 8-4

NAME YOLLA#1, 3007-3016m. BRANCHED CYCLIC FRAGMENTOGRAM.
MISC 6-1-86. GEC/GW. 0.2ul/50ul. COL#41.

FRN 5882



NAME YOLLA#1, 3007-3016m. BRANCHED CYCLIC FRAGMENTOGRAM.
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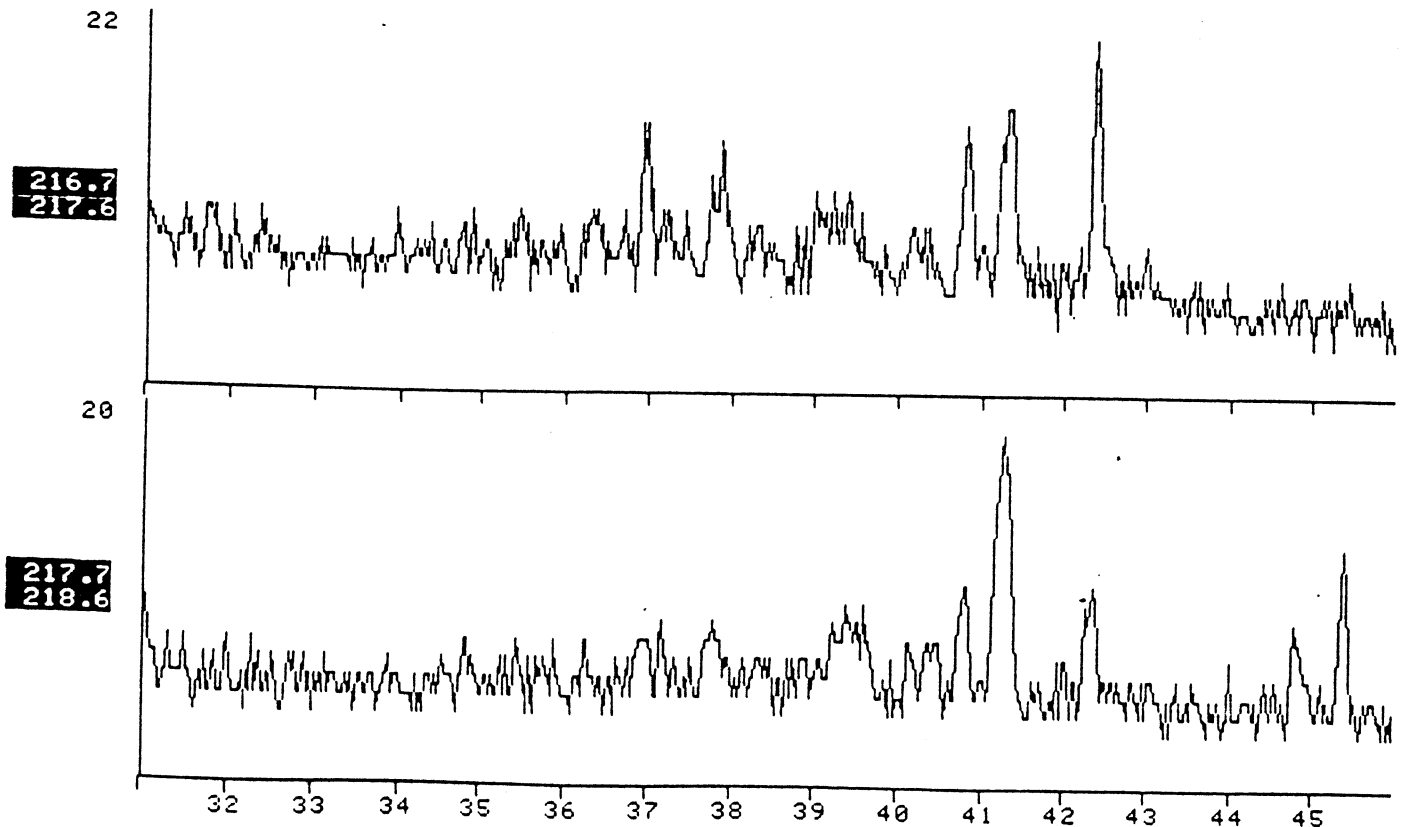
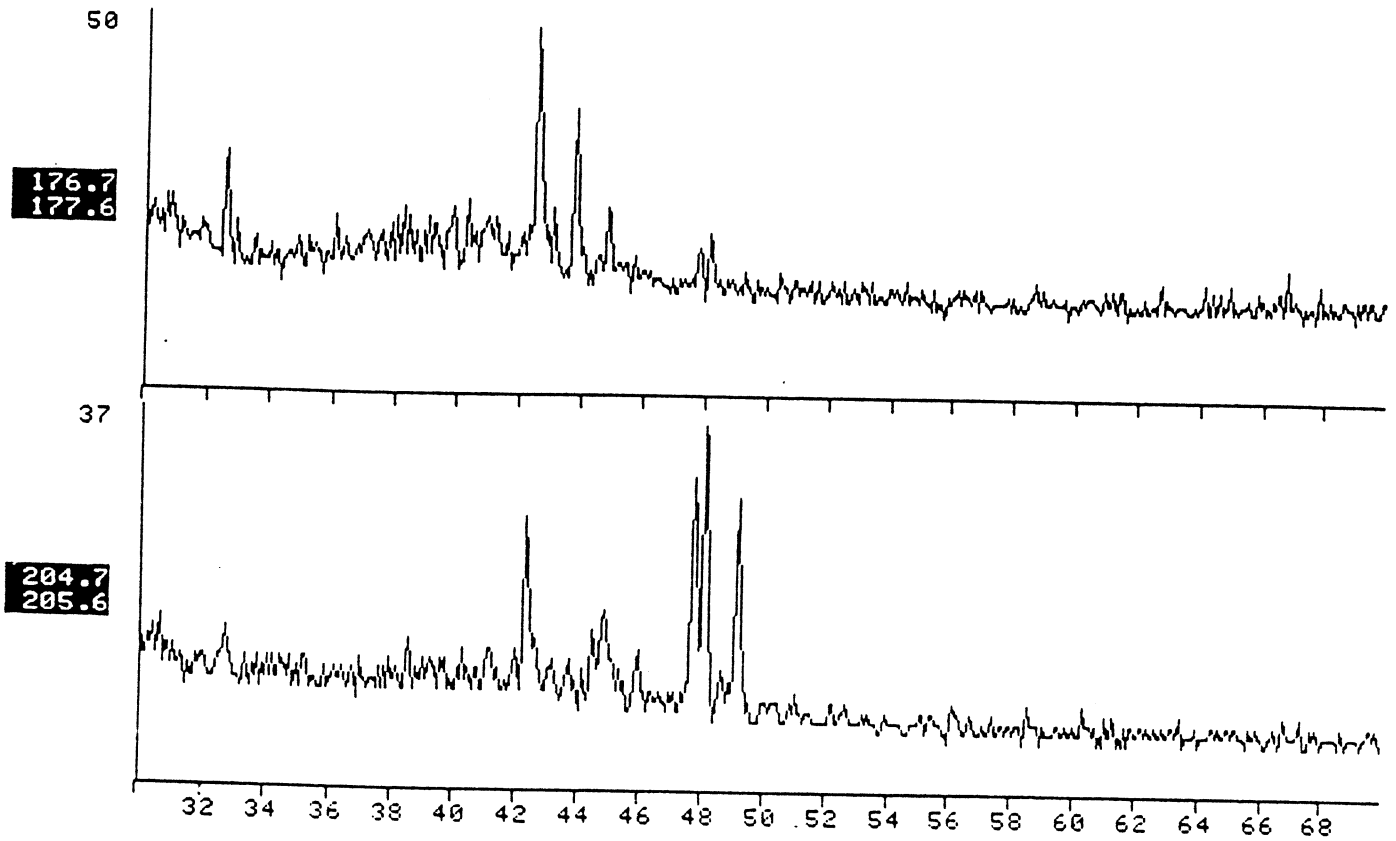


FIGURE 8-5

NAME YOLLA#1, 3007-3016m. BRANCHED CYCLIC FRAGMENTOGRAM.
MISC 6-1-86. GEC/GW. 0.2ul/50ul. COL#41.

FRN 5882



NAME YOLLA#1, 3007-3016m. BRANCHED CYCLIC FRAGMENTOGRAM.
MISC 6-1-86. GEC/GW. 0.2ul/50ul. COL#41.

FRN 5882

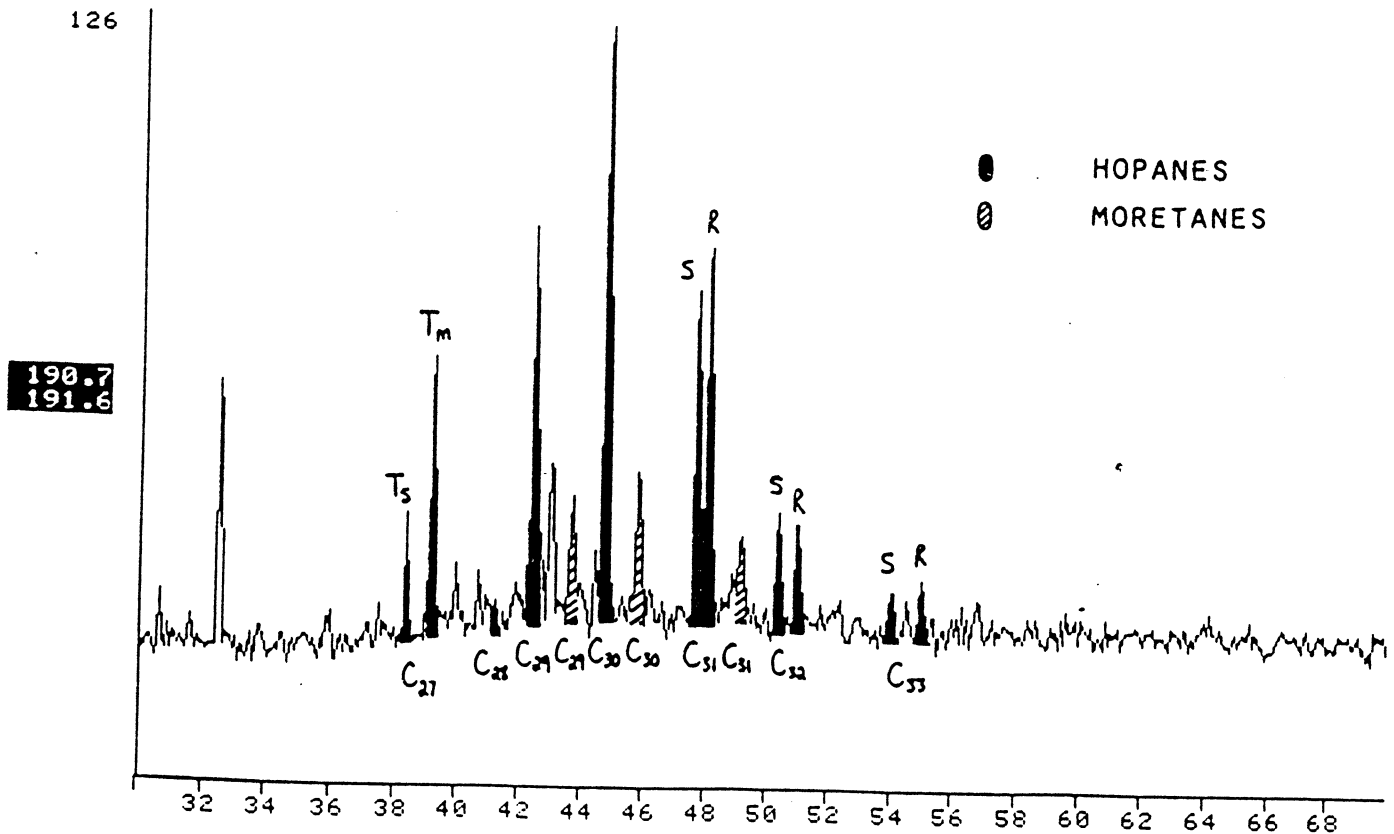
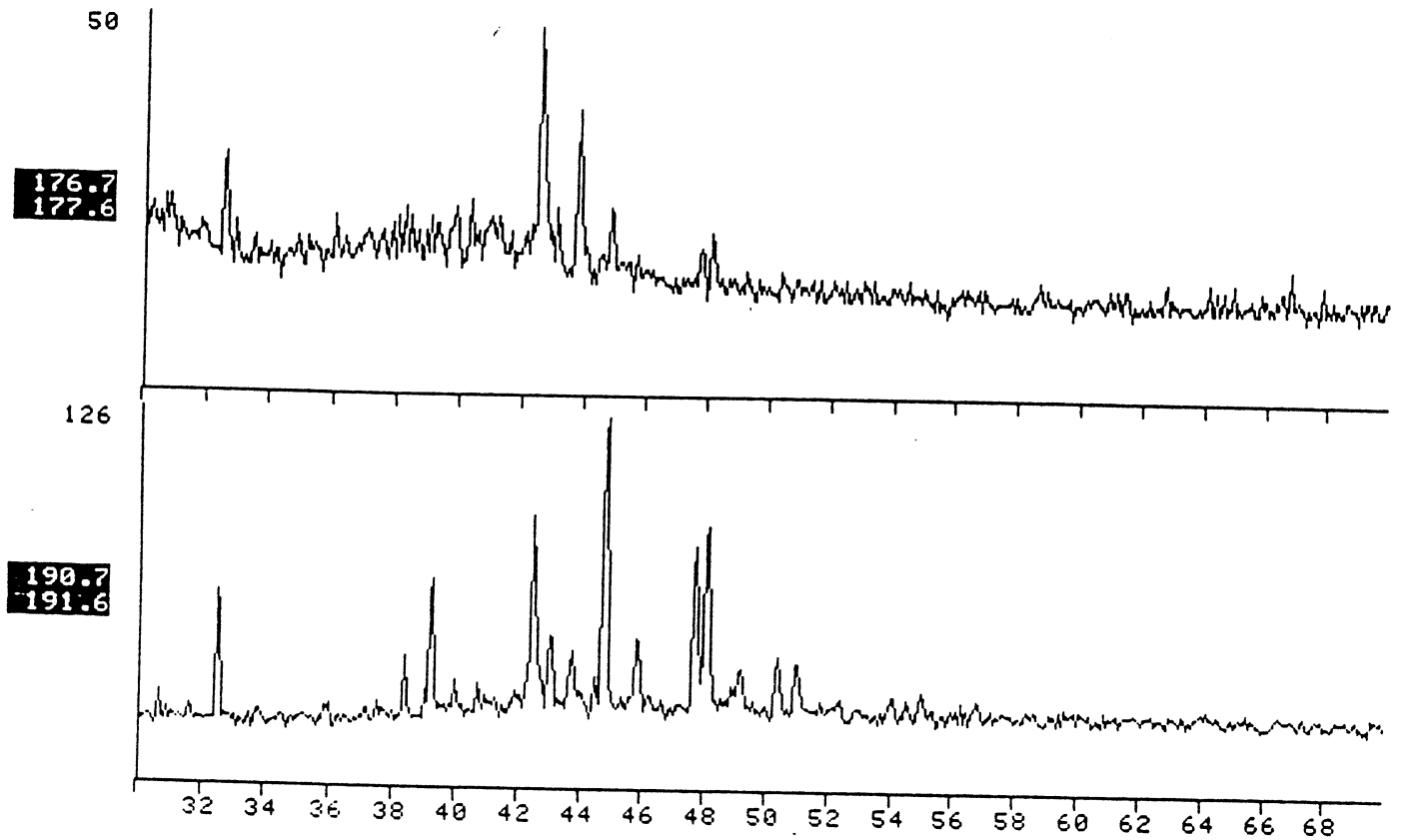


FIGURE 8-6

NAME YOLLA*1, 3007-3016m. BRANCHED CYCLIC FRAGMENTOGRAM.
MISC 6-1-86. GEC/GW. 0.2ul/50ul. COL#41.

FRN 5882



NAME YOLLA*1, 3007-3016m. BRANCHED CYCLIC FRAGMENTOGRAM.
MISC 6-1-86. GEC/GW. 0.2ul/50ul. COL#41.

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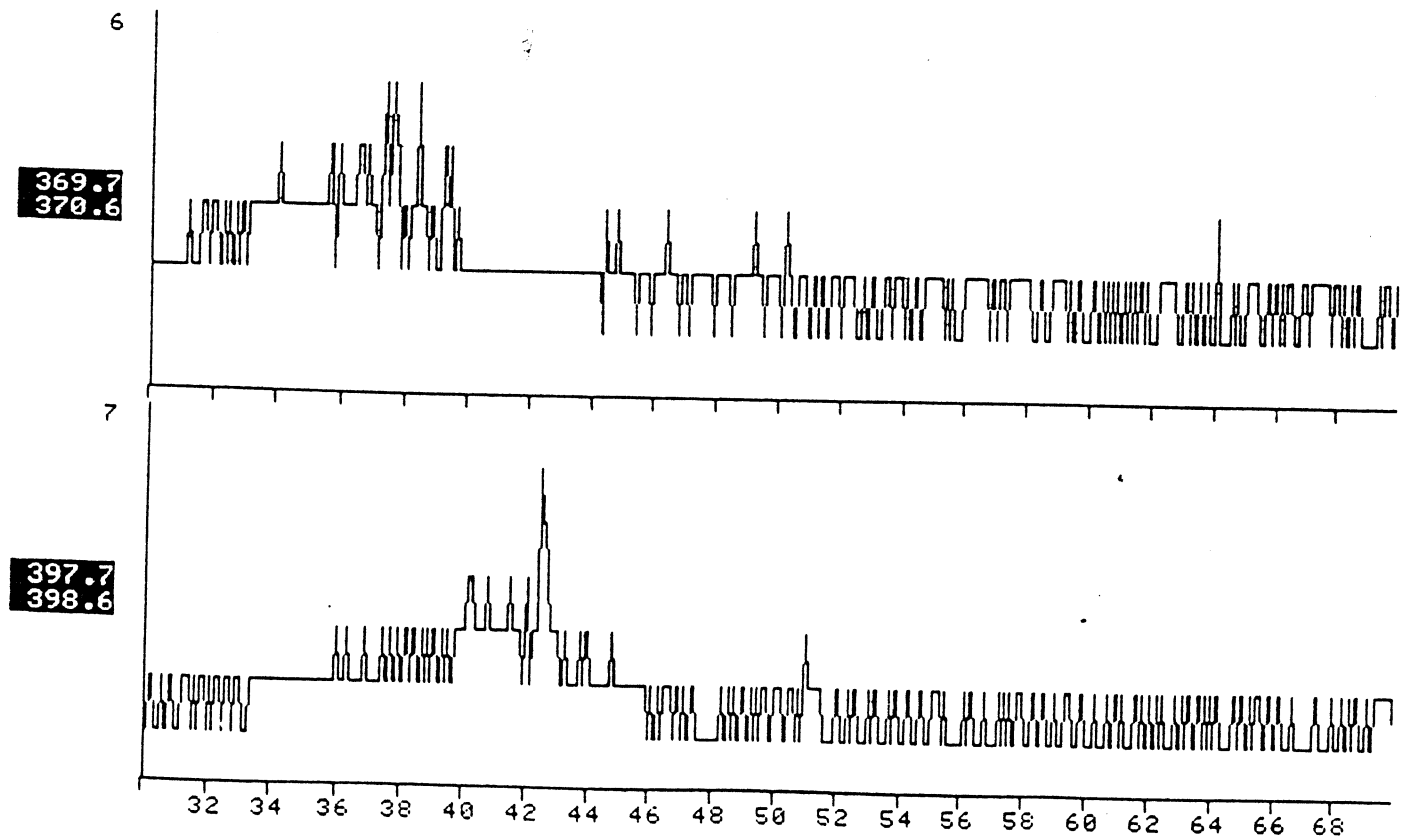
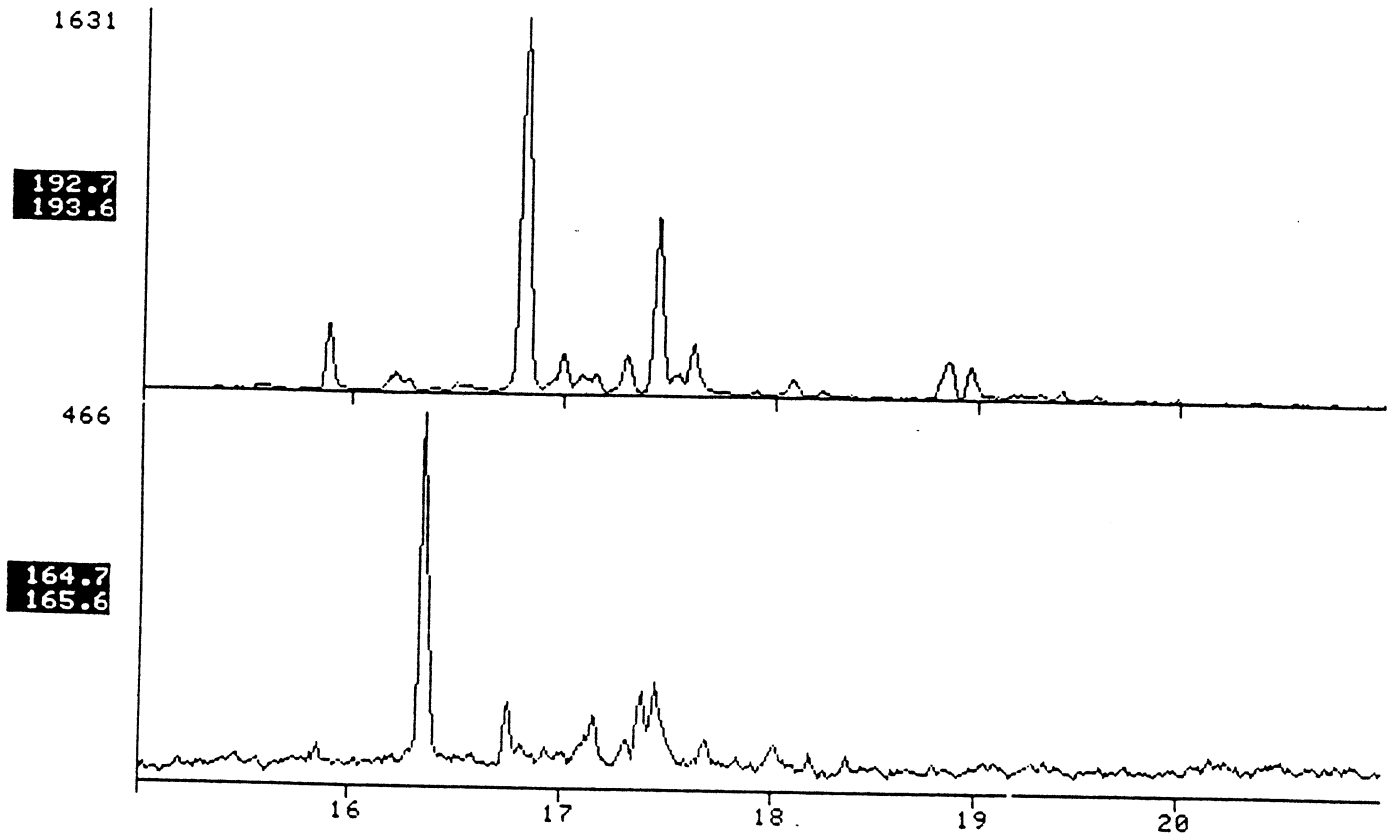


FIGURE 8-7

NAME YOLLA#1, 3007-3016m. BRANCHED CYCLIC FRAGMENTOGRAM.
 MISC 6-1-86. GEC/GW. 0.2ul/50ul. COL#41.

FRN 5882



NAME YOLLA#1, 3007-3016m. BRANCHED CYCLIC FRAGMENTOGRAM.
 MISC 6-1-86. GEC/GW. 0.2ul/50ul. COL#41.

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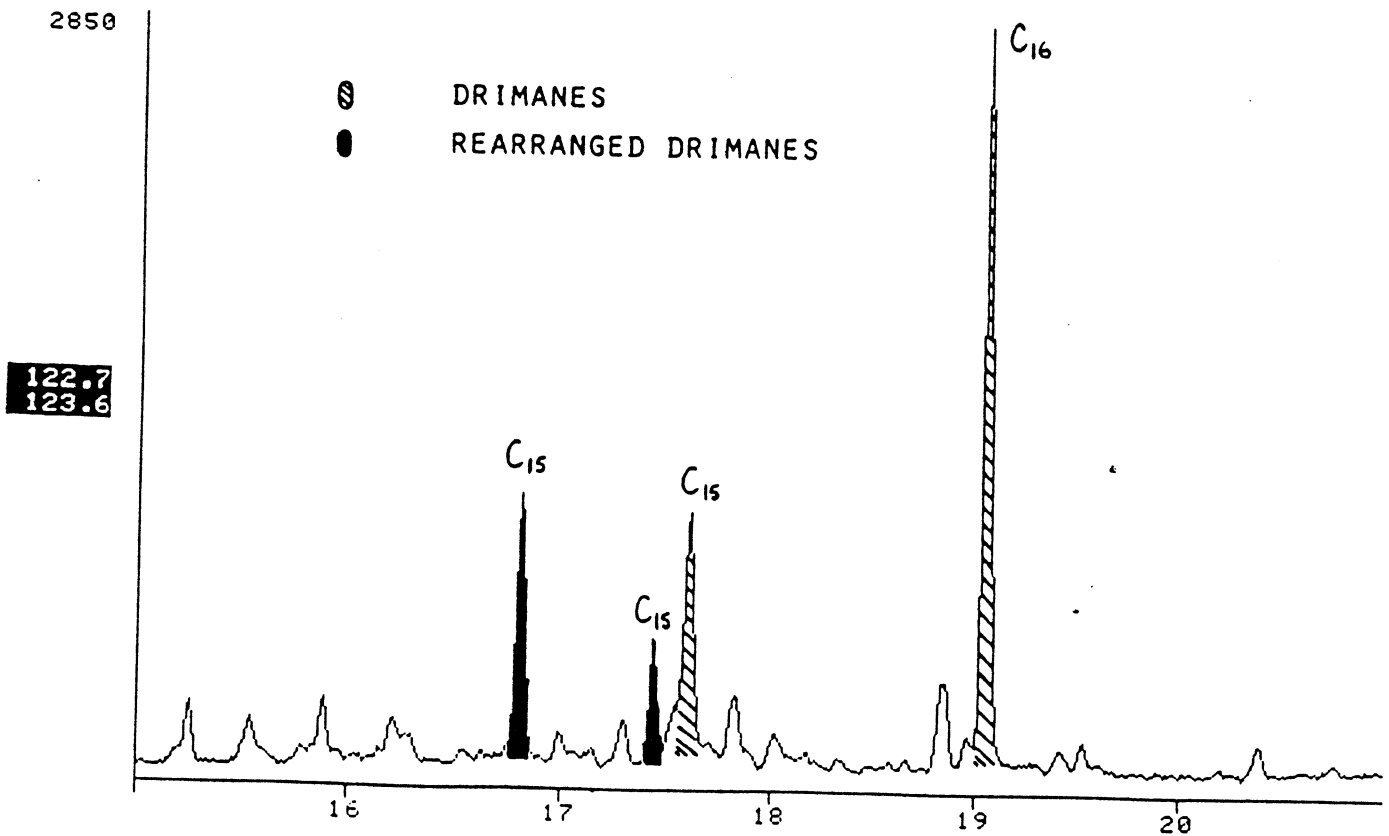
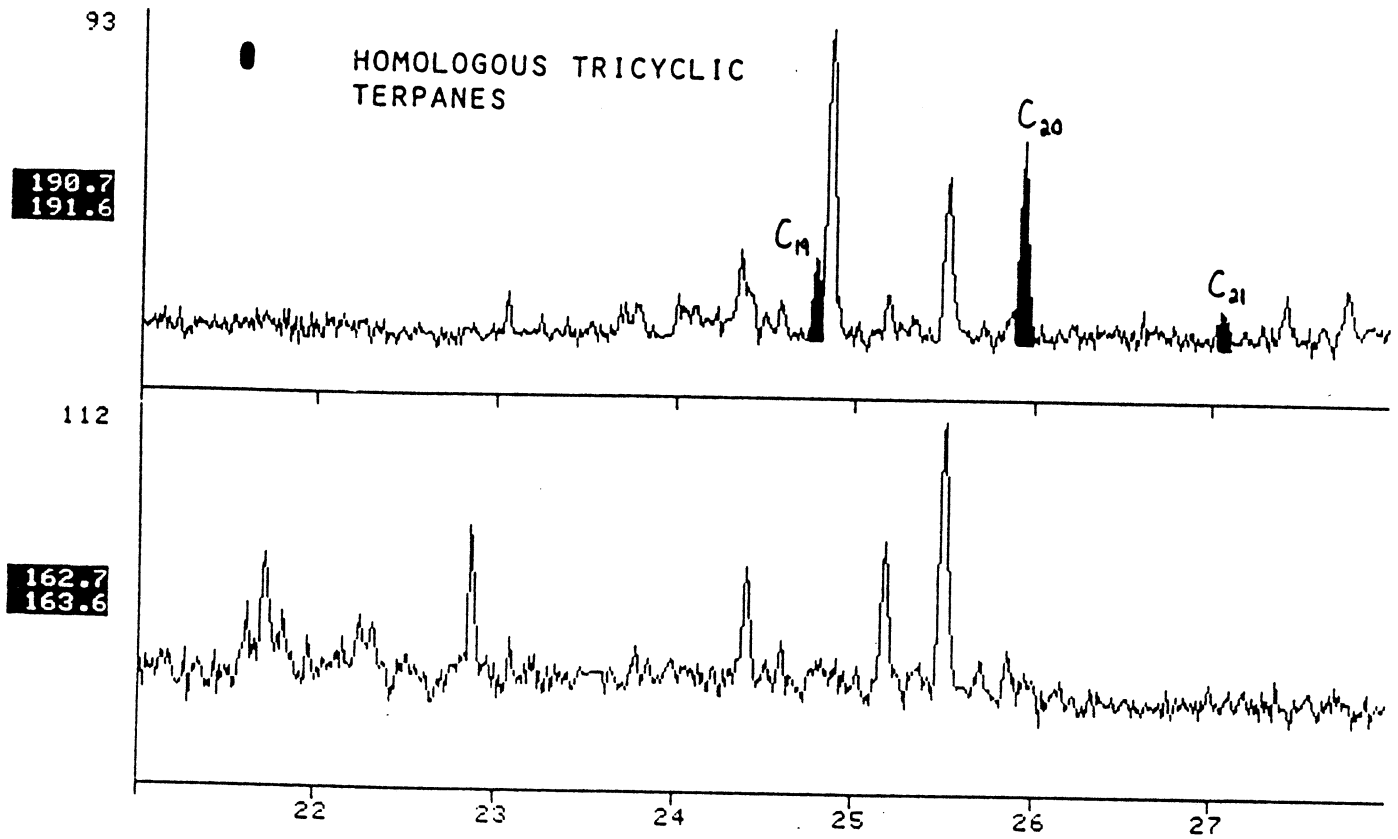


FIGURE 8-8

NAME YOLLA#1, 3007-3016m. BRANCHED CYCLIC FRAGMENTOGRAM.
 MISC 6-1-86. GEC/GW. 0.2ul/50ul. COL#41.

FRN 5882



NAME YOLLA#1, 3007-3016m. BRANCHED CYCLIC FRAGMENTOGRAM.
 MISC 6-1-86. GEC/GW. 0.2ul/50ul. COL#41.

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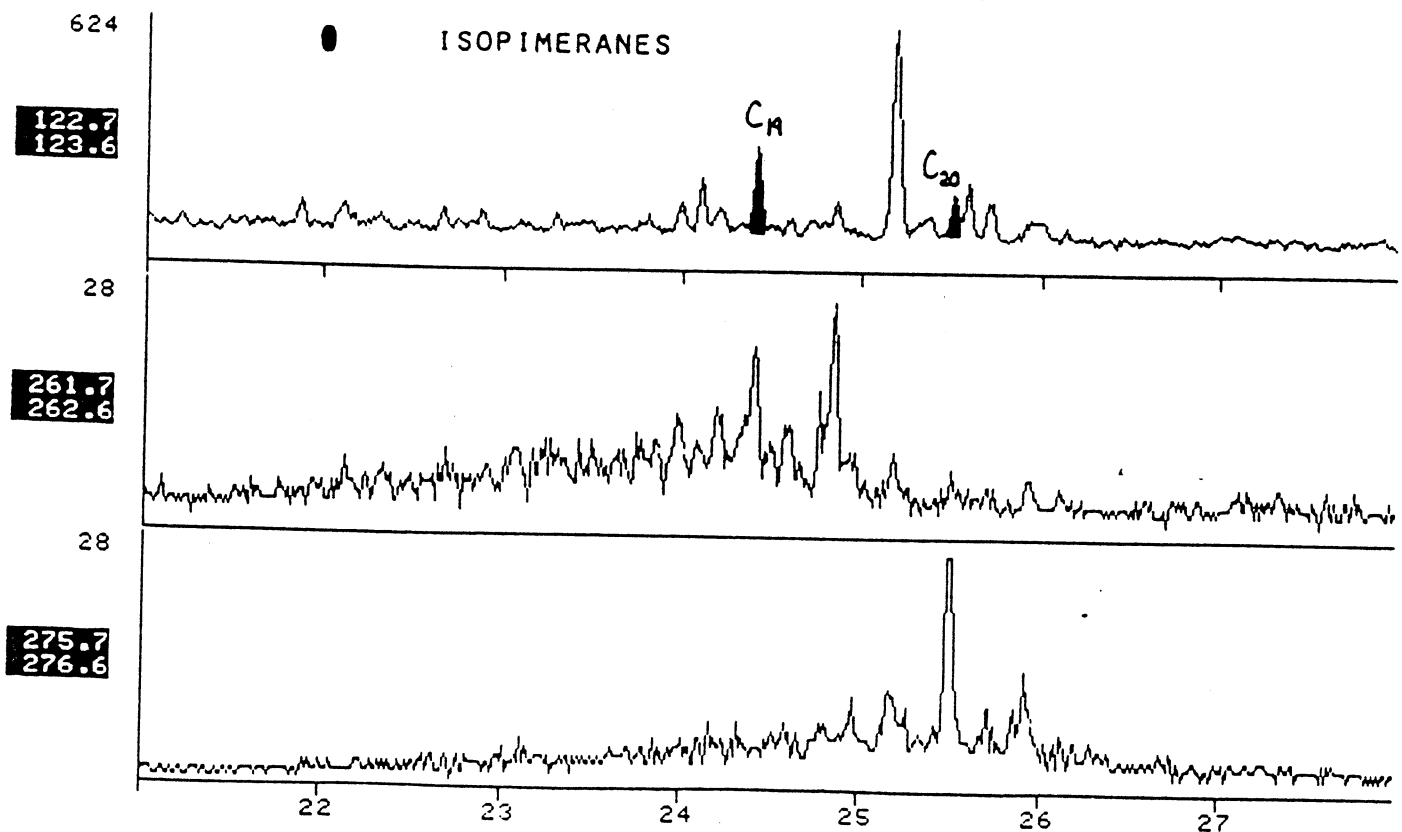
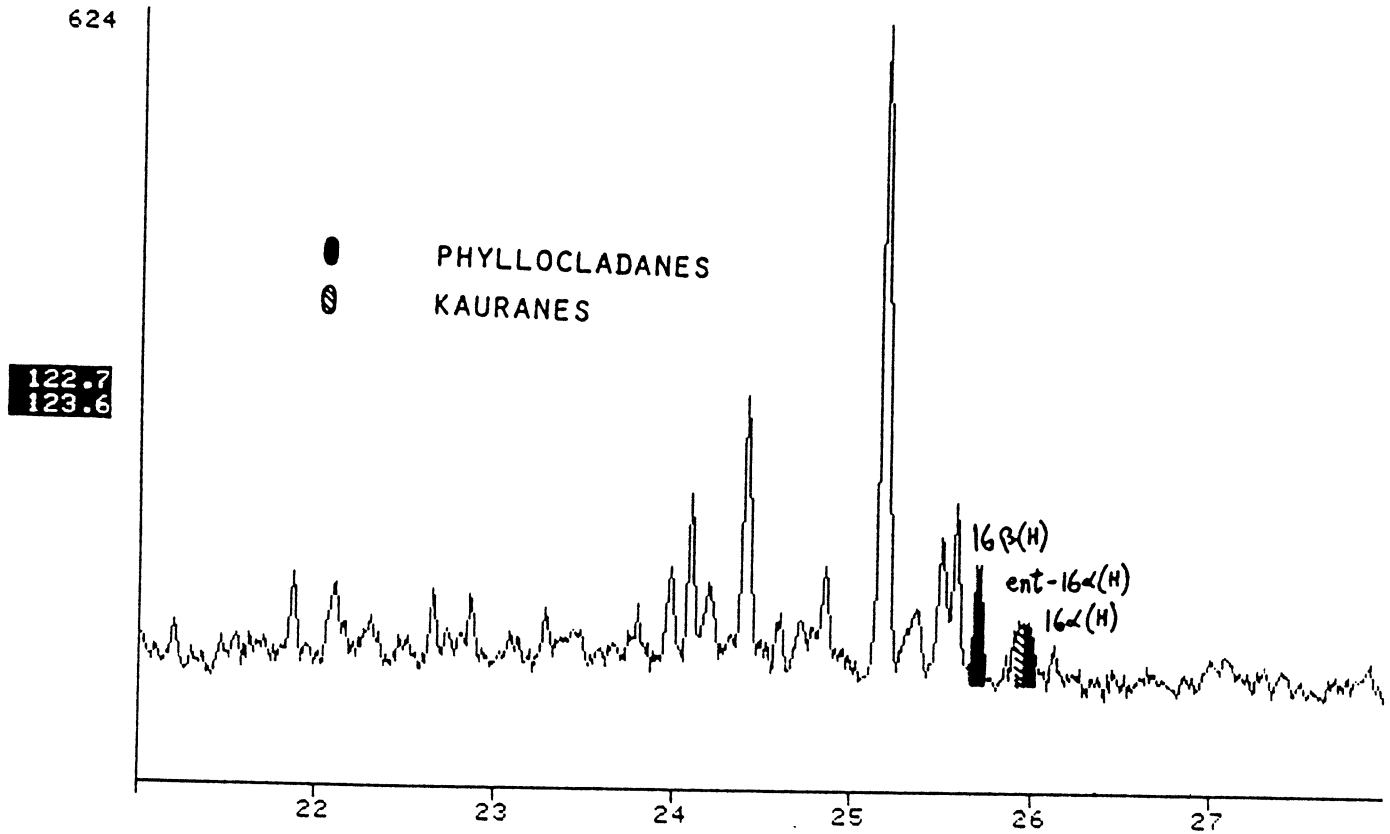


FIGURE 8-9

NAME YOLLA*1, 3007-3016m. BRANCHED CYCLIC FRAGMENTOGRAM.
MISC 6-1-86. GEC/GW. 0.2ul/50ul. COL#41.

FRN 5882



NAME YOLLA*1, 3007-3016m. BRANCHED CYCLIC FRAGMENTOGRAM.
MISC 6-1-86. GEC/GW. 0.2ul/50ul. COL#41.

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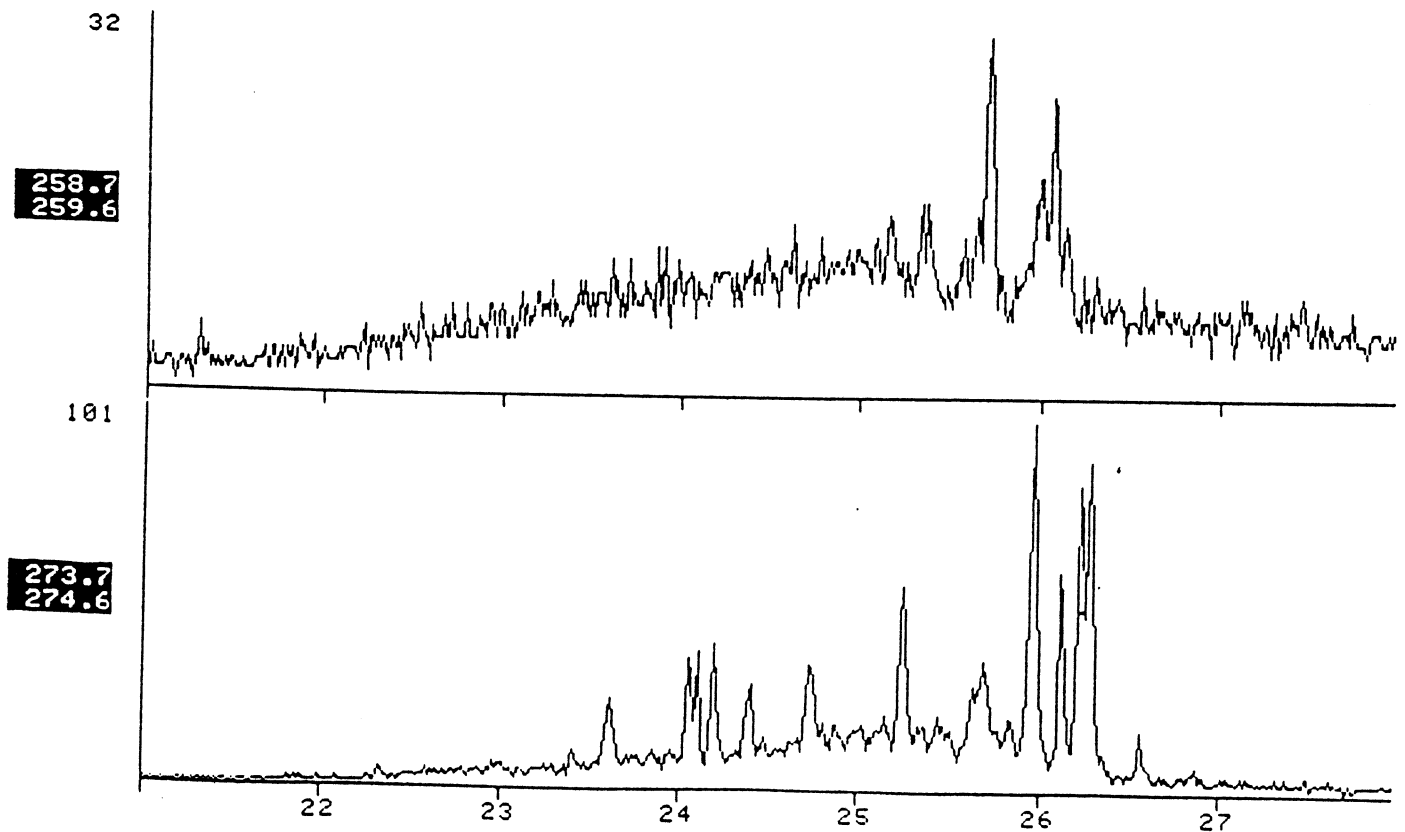


FIGURE 9-1

YOLLA 1, 1830-1835, DST 2

September 22nd 1985

5.30pm, 600psi drawdown

Whole Oil

C_1-C_{31} GLC

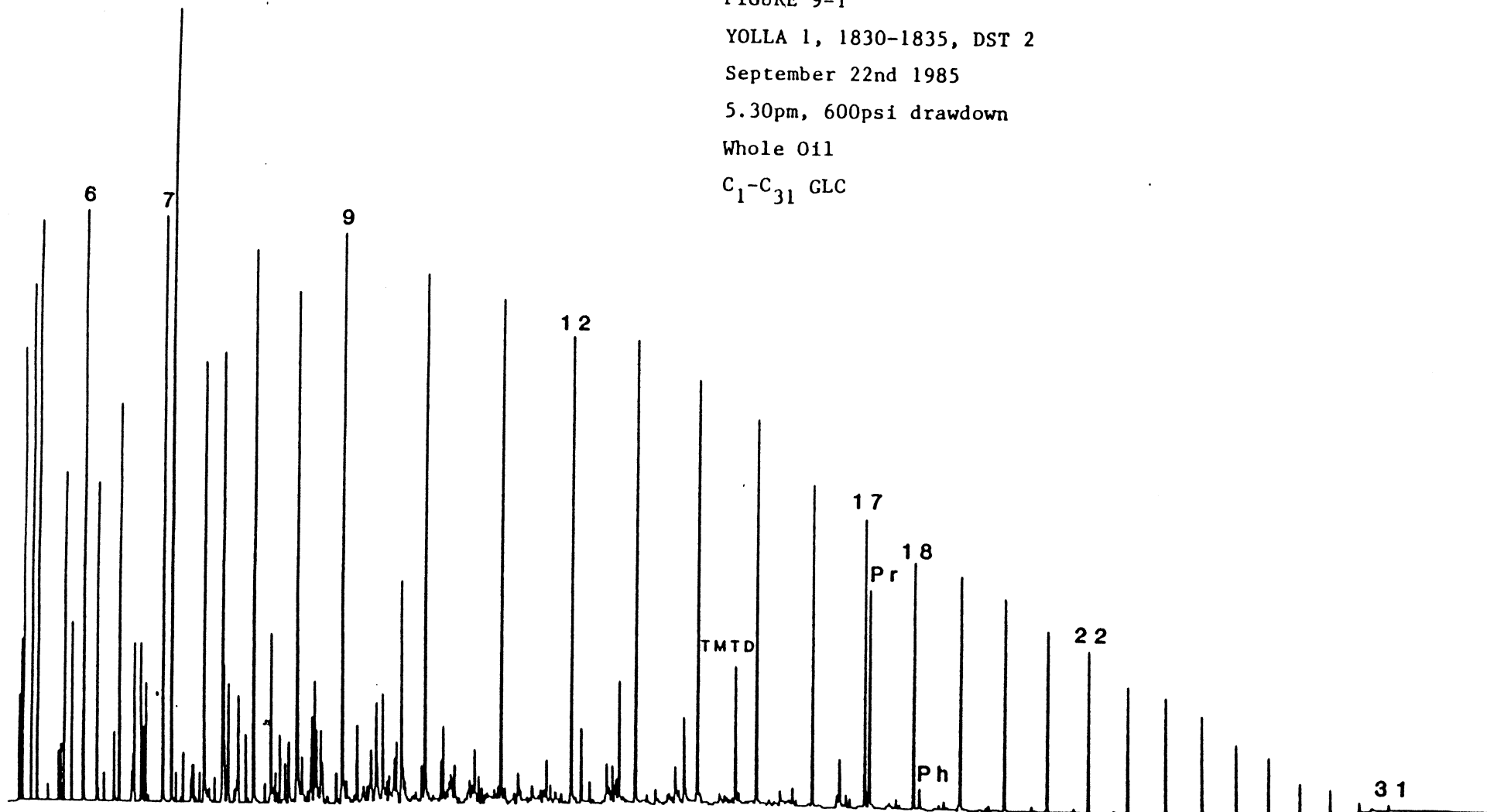


FIGURE 9-2

YOLLA 1, DST 1, 2809-14, 2818-24.5m

Condensate Sample 51° API, 17/09/85

Whole Oil

C₁-C₃₁ GLC

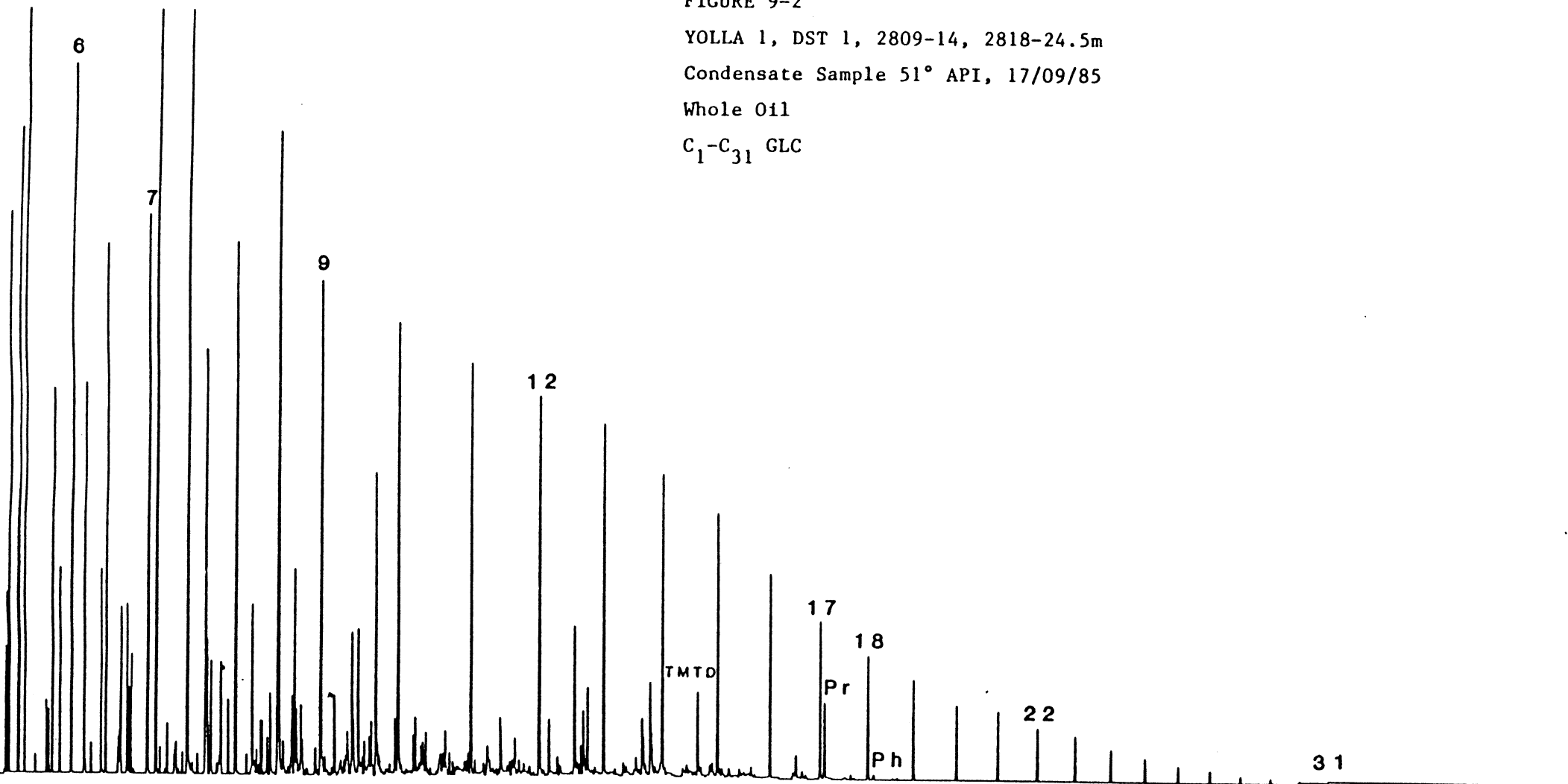


FIGURE 10-1

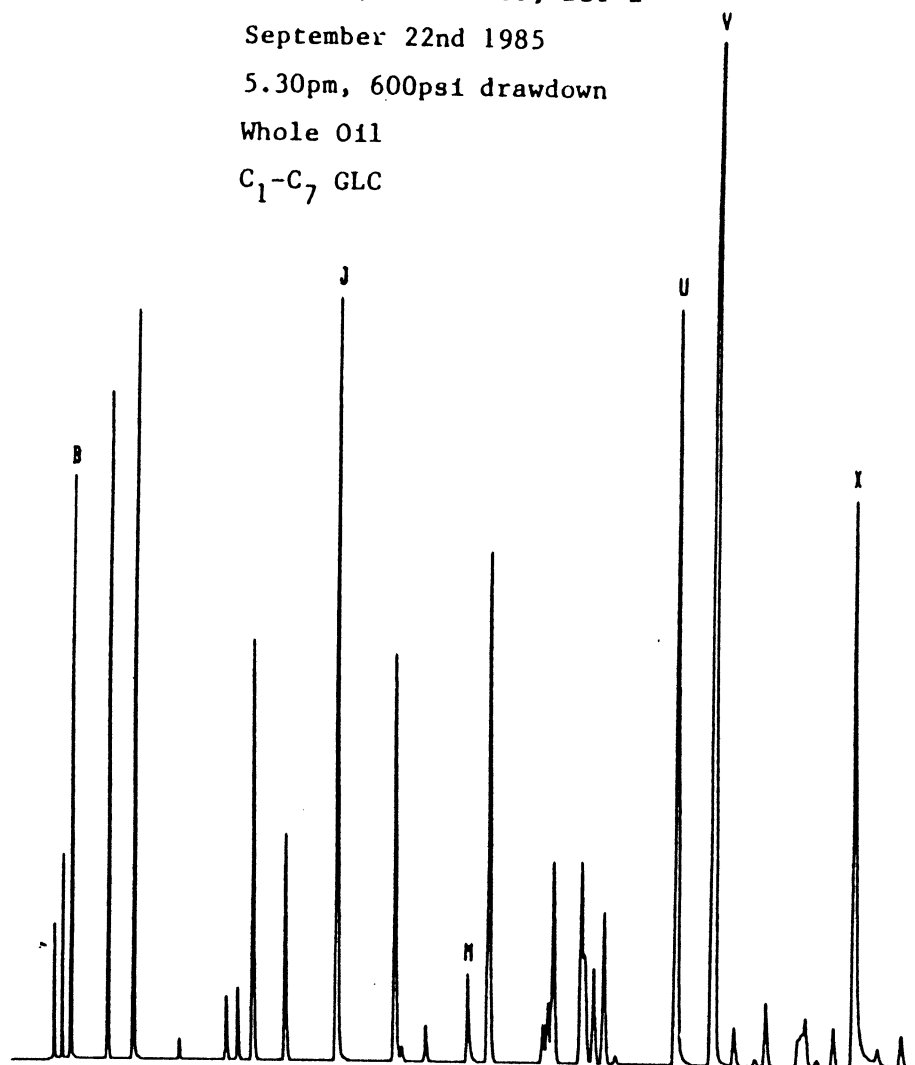
YOLLA 1, 1830-1835, DST 2

September 22nd 1985

5.30pm, 600psi drawdown

Whole Oil

C₁-C₇ GLC



C4-7 COMPOUNDS

A	isobutane
B	n-butane
C	isopentane
D	n-pentane
E	2,2-dimethylbutane
F	cyclopentane
G	2,3-dimethylbutane
H	2-methylpentane
I	3-methylpentane
J	n-hexane
K	methylcyclopentane
L	2,4-dimethylpentane
M	benzene
N	cyclohexane
O	1,1-dimethylcyclopentane
P	2-methylhexane
Q	3-methylhexane
R	1 cis-3-dimethylcyclopentane
S	1 trans-3-dimethylcyclopentane
T	1 trans-2-dimethylcyclopentane
U	n-heptane
V	methylcyclohexane
W	1 cis-2-dimethylcyclopentane
X	toluene

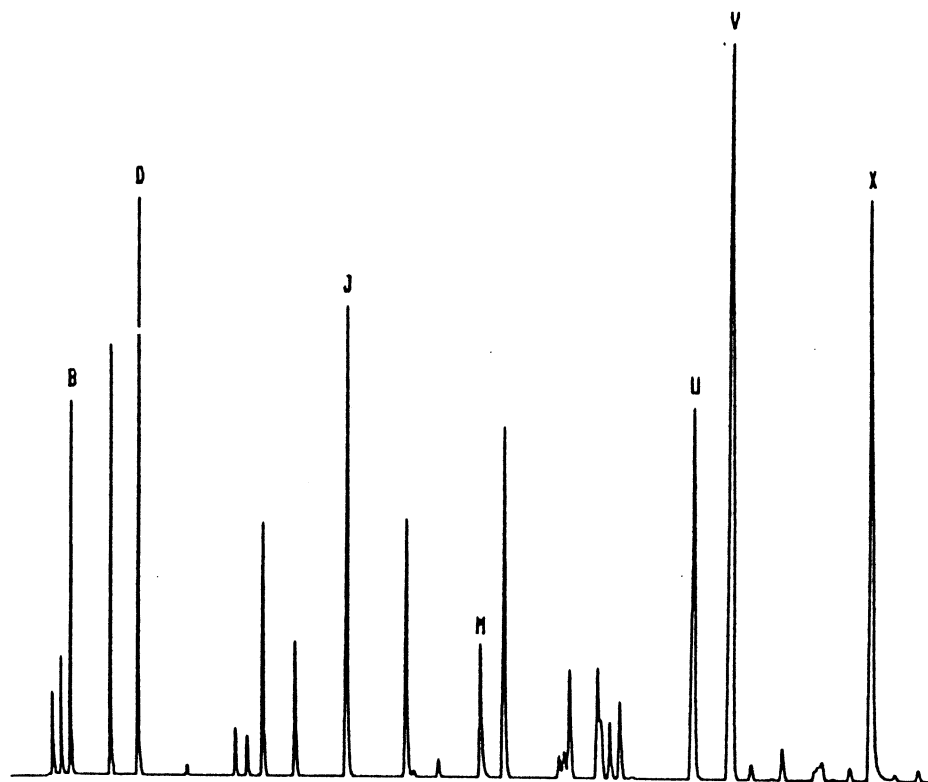
FIGURE 10-2

YOLLA 1, DST 1, 2809-14, 2818-24.5m

Condensate Sample 51° API, 17/09/85

Whole Oil

C₁-C₇ GLC



C₄-C₇ COMPOUNDS

A	isobutane
B	n-butane
C	isopentane
D	n-pentane
E	2,2-dimethylbutane
F	cyclopentane
G	2,3-dimethylbutane
H	2-methylpentane
I	3-methylpentane
J	n-hexane
K	methylcyclopentane
L	2,4-dimethylpentane
M	benzene
N	cyclohexane
O	1,1-dimethylcyclopentane
P	2-methylhexane
Q	3-methylhexane
R	1 cis-3-dimethylcyclopentane
S	1 trans-3-dimethylcyclopentane
T	1 trans-2-dimethylcyclopentane
U	n-heptane
V	methylcyclohexane
W	1 cis-2-dimethylcyclopentane
X	toluene

FIGURE 11-1

YOLLA 1, 1830-1835m, DST 2

September 22nd 1985

5.30 pm, 600psi drawdown

Whole Oil

C₁₂⁺ GLC

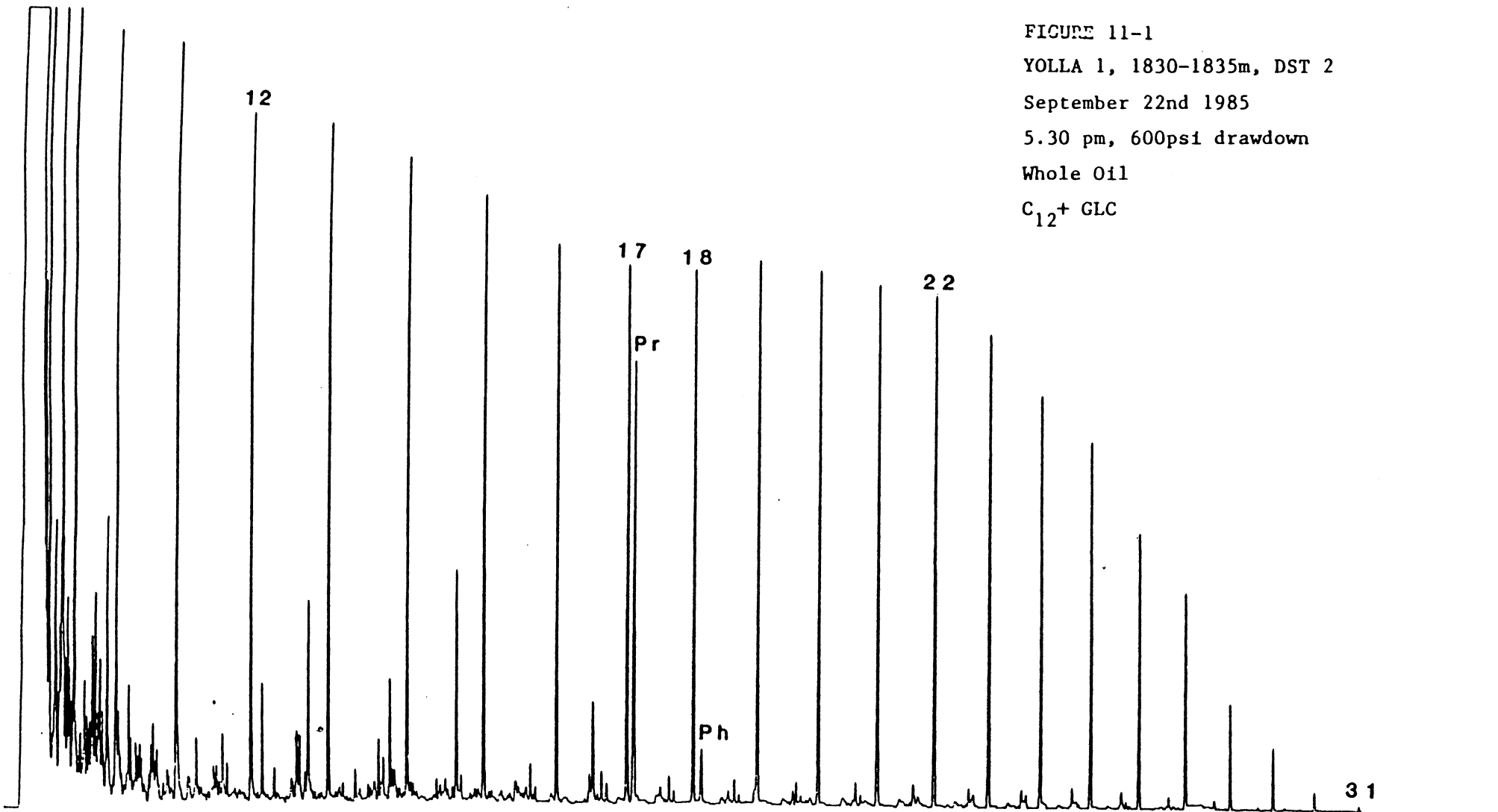


FIGURE 11-2

YOLLA 1, 1830-1835m, DST 2

September 22nd 1985

10.00pm, 300psi drawdown

Whole Oil

C₁₂⁺ GLC

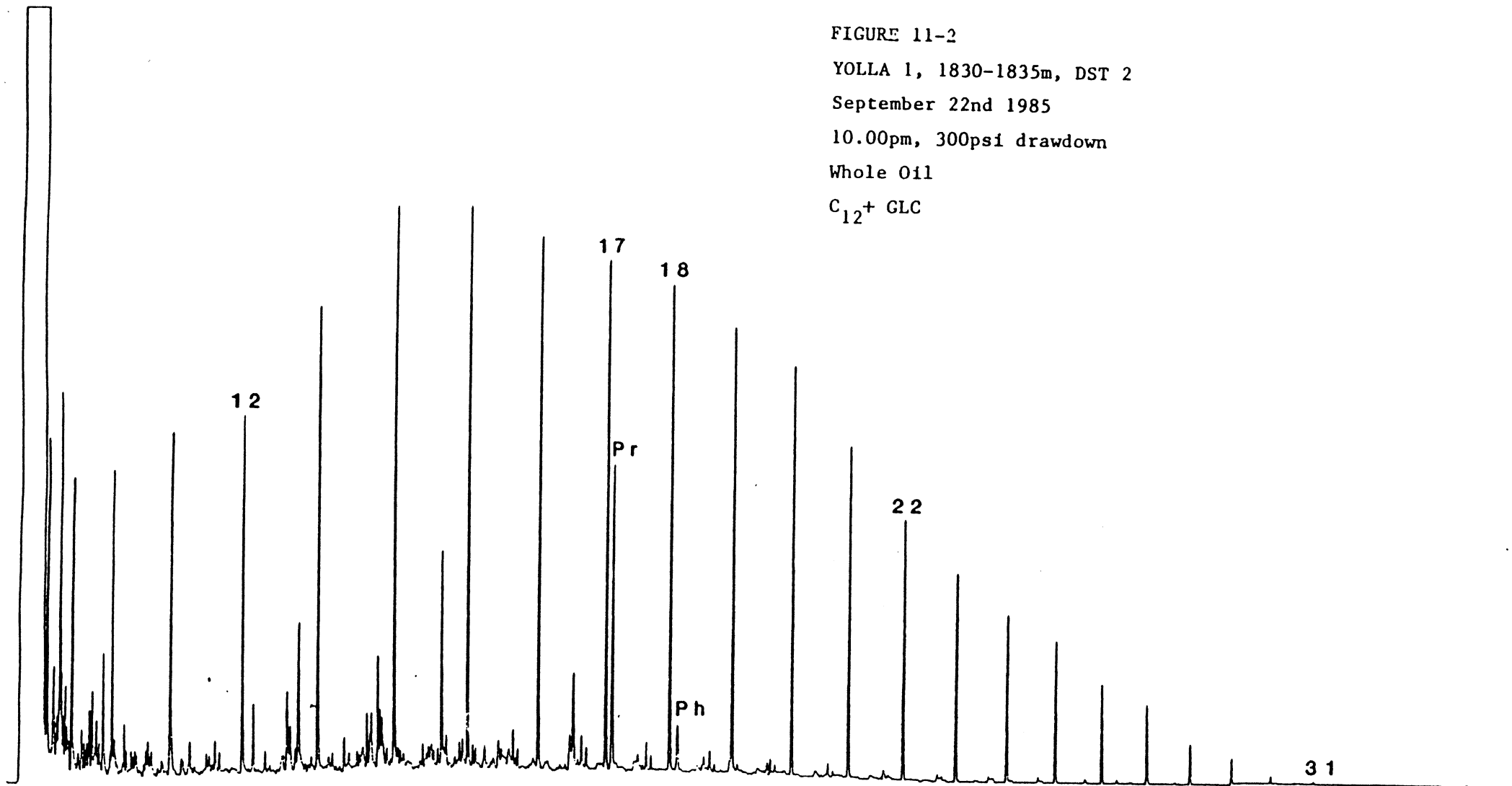
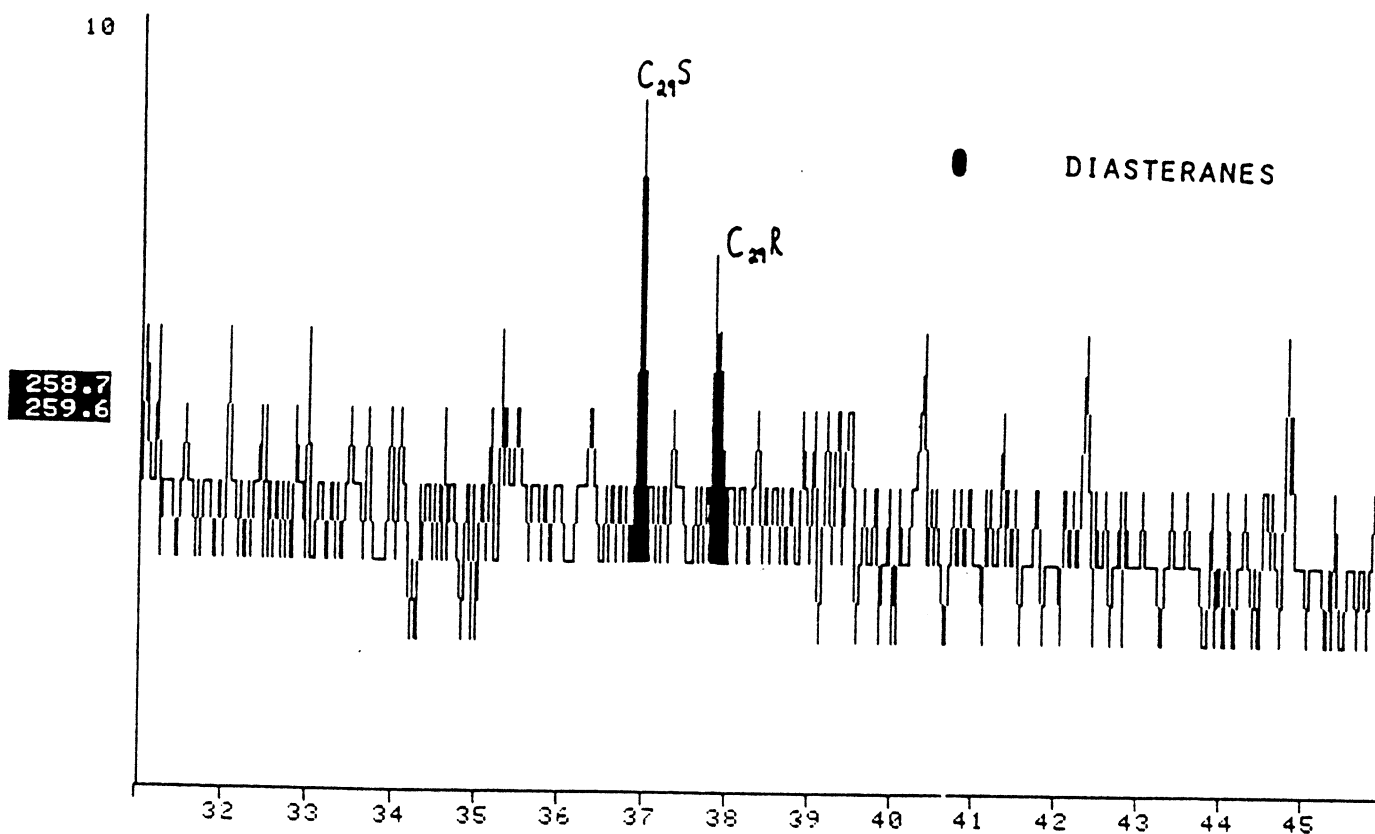


FIGURE 12-1

NAME YOLLA#1, DST#2. BRANCHED CYCLIC FRAGMENTOGRAM.
MISC 6-1-86. GEC/GW. 0.2ul/100ul. COL#41.

FRN 5881



NAME YOLLA#1, DST#2. BRANCHED CYCLIC FRAGMENTOGRAM.
MISC 6-1-86. GEC/GW. 0.2ul/100ul. COL#41.

FRN 5881

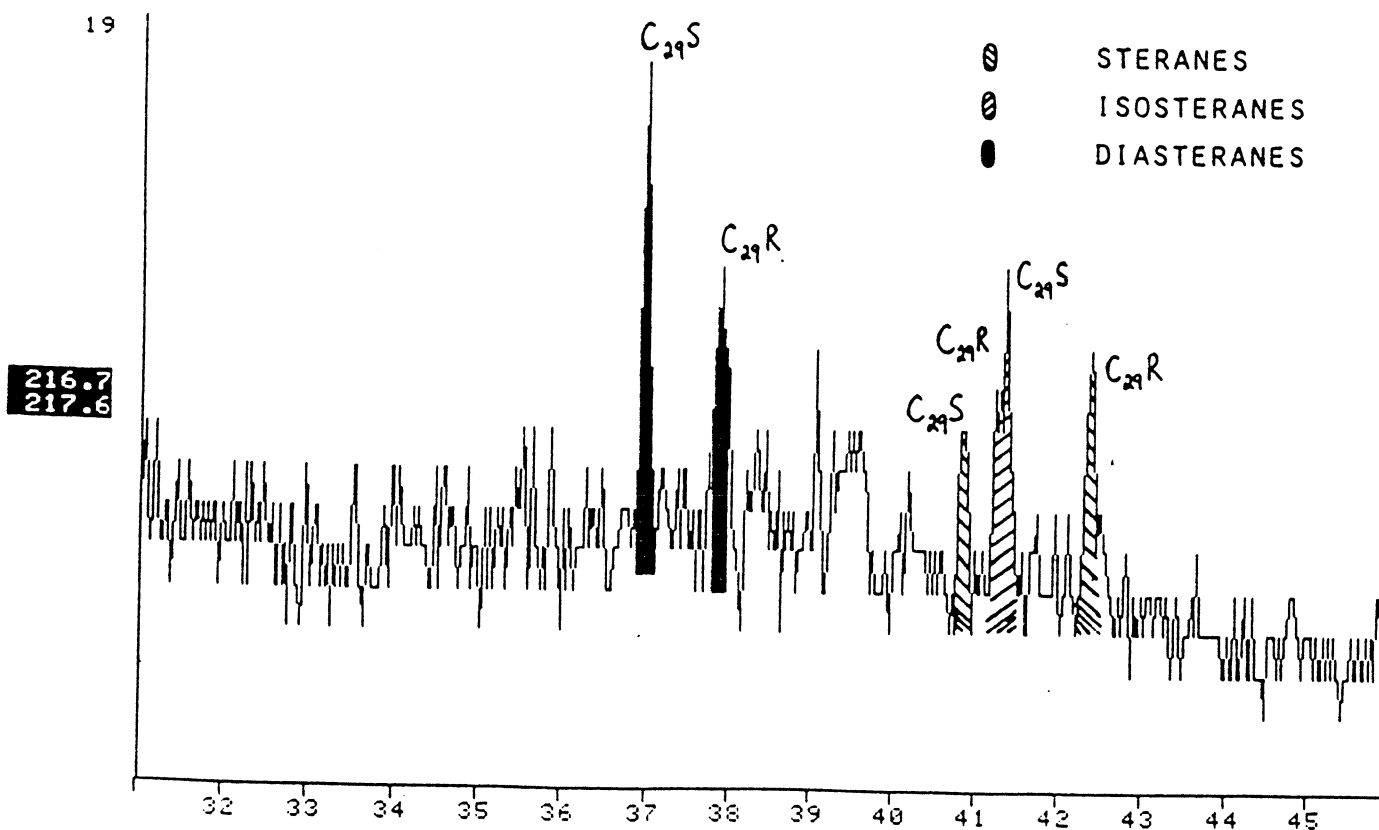
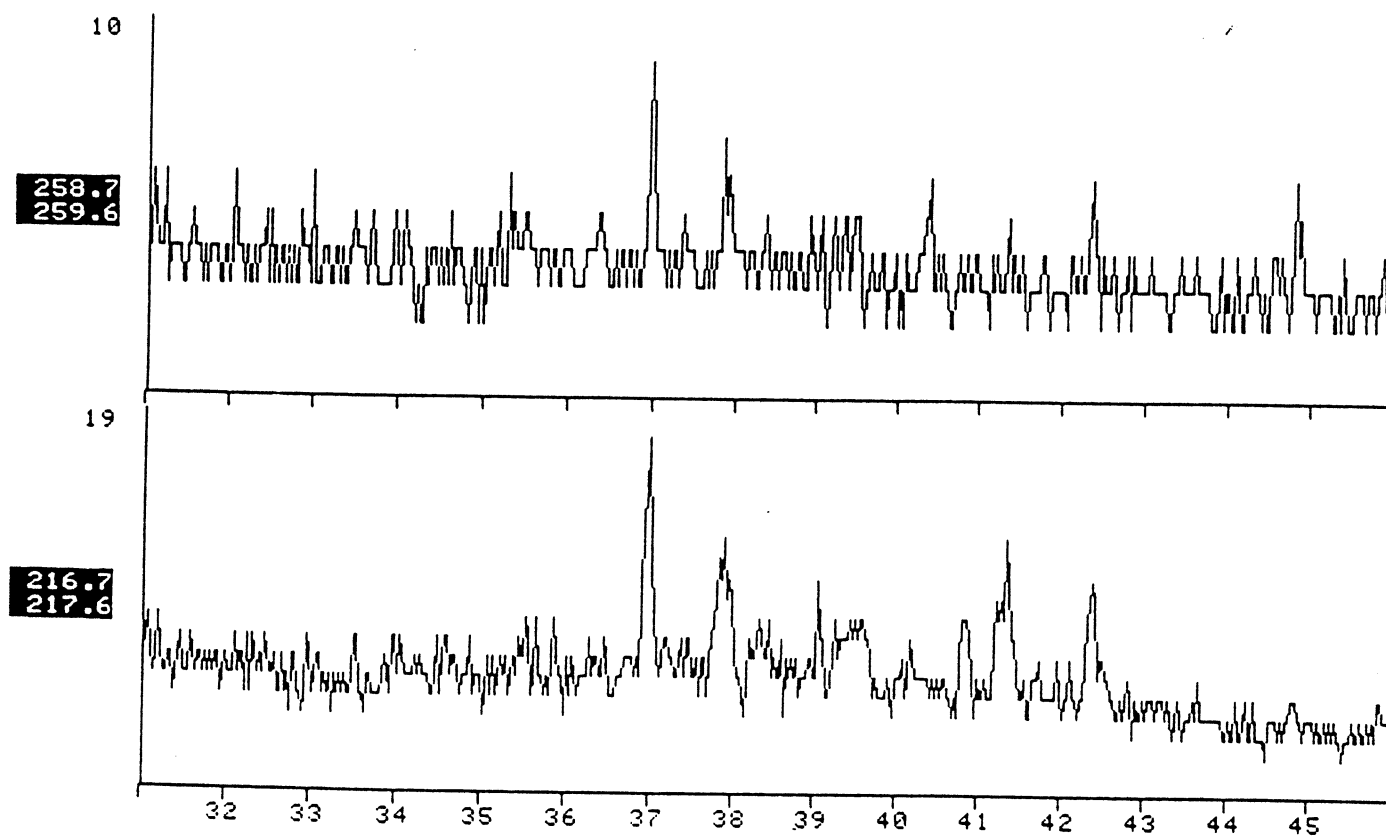


FIGURE 12-2

NAME YOLLA#1, DST#2. BRANCHED CYCLIC FRAGMENTOGRAM.
MISC 6-1-86. GEC/GW. 0.2ul/100ul. COL#41.

FRN 5881



NAME YOLLA#1, DST#2. BRANCHED CYCLIC FRAGMENTOGRAM.
MISC 6-1-86. GEC/GW. 0.2ul/100ul. COL#41.

FRN 5881

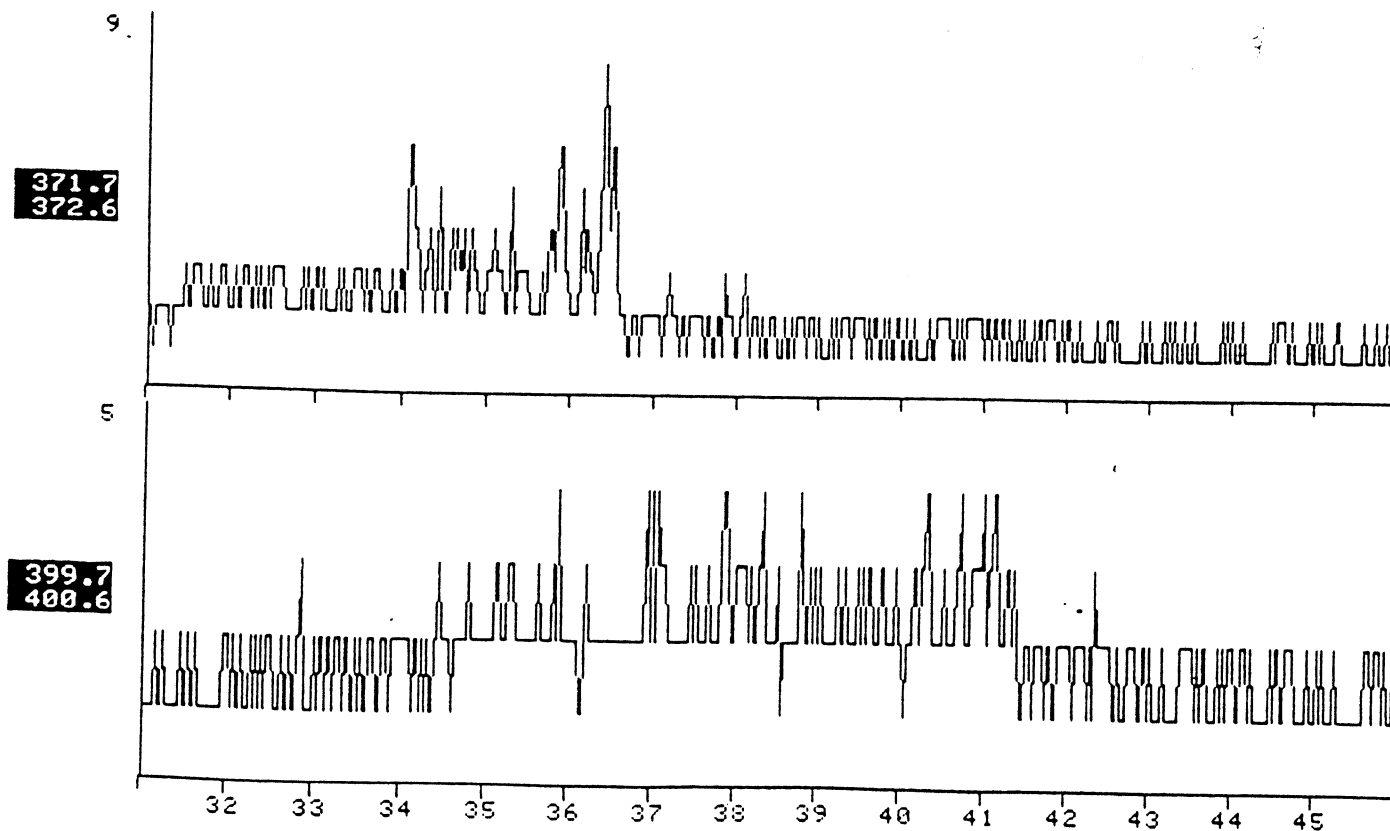
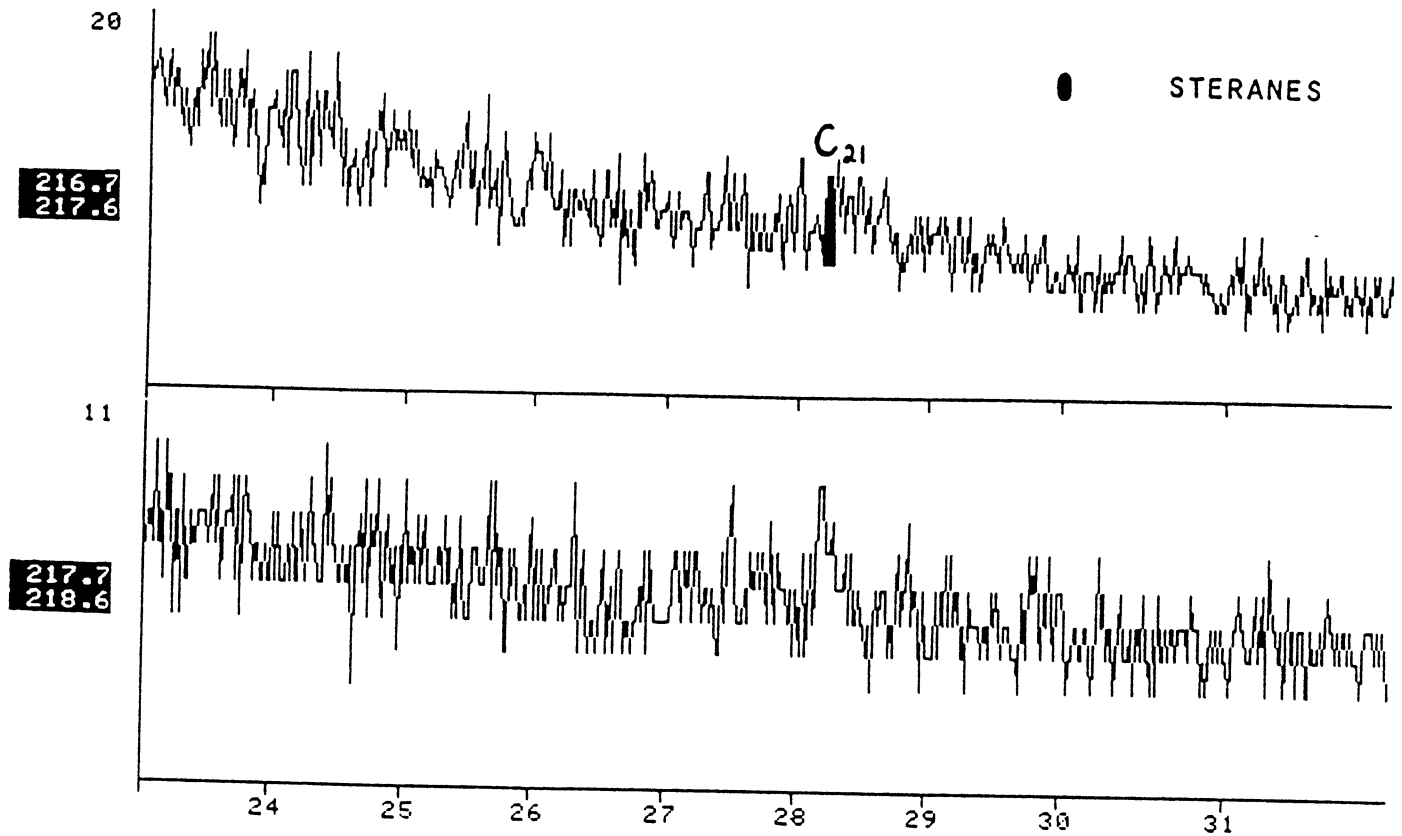


FIGURE 12-3

NAME YOLLA*1, DST*2. BRANCHED CYCLIC FRAGMENTOGRAM.
MISC 6-1-86. GEC/GW. 0.2ul/100ul. COL*41.

FRN 5881



NAME YOLLA*1, DST*2. BRANCHED CYCLIC FRAGMENTOGRAM.
MISC 6-1-86. GEC/GW. 0.2ul/100ul. COL*41.

FRN 5881

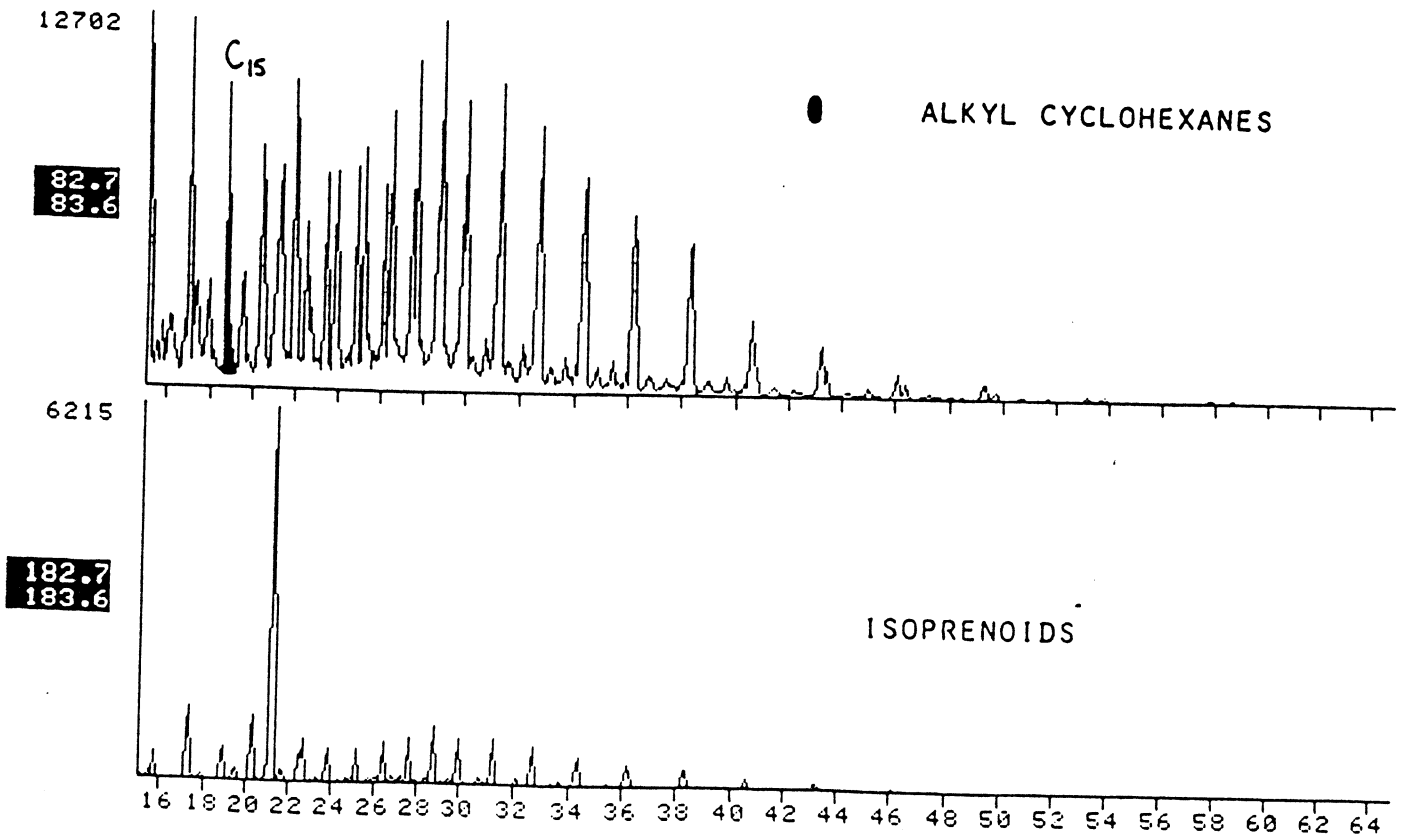
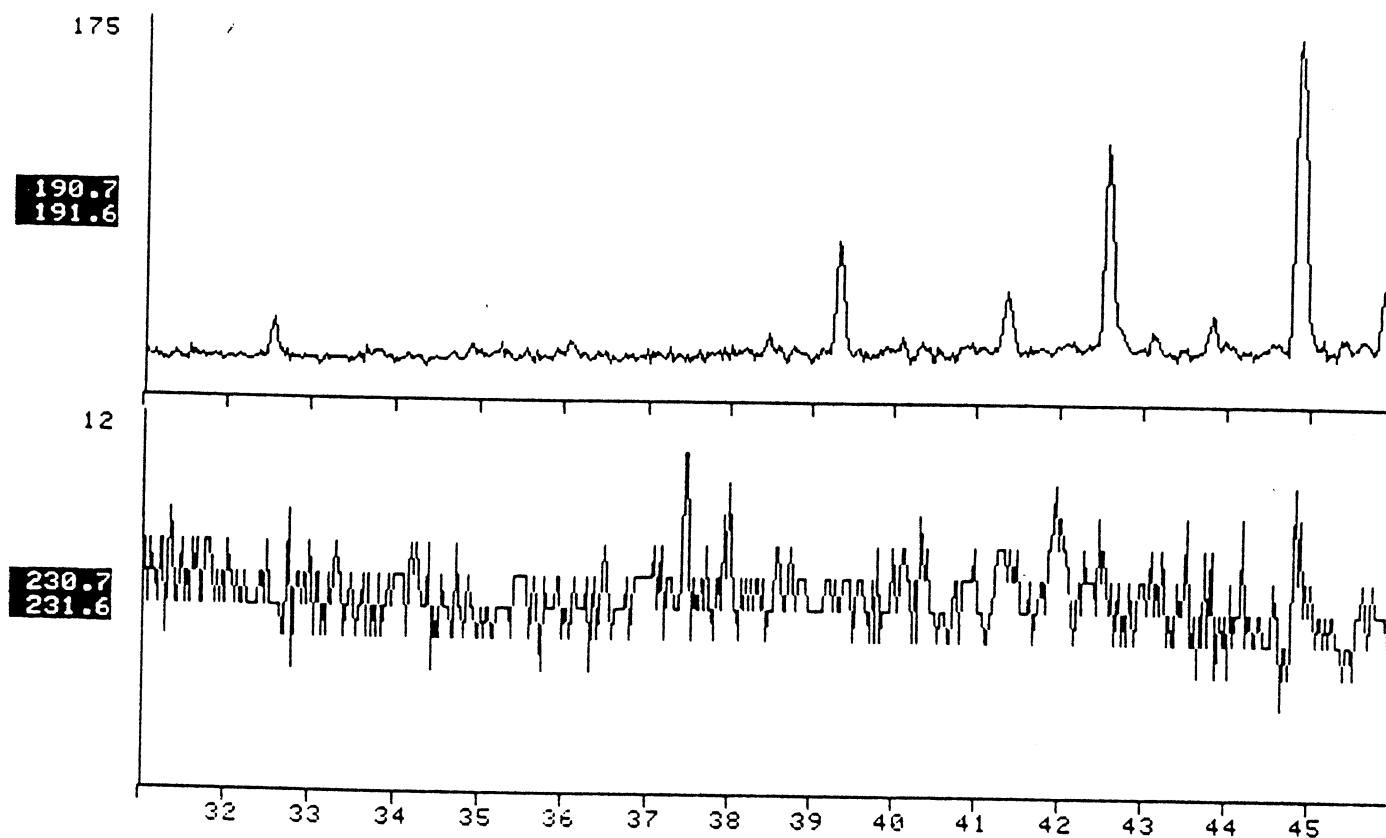


FIGURE 12-4

NAME YOLLA#1, DST#2. BRANCHED CYCLIC FRAGMENTOGRAM.
MISC 6-1-86. GEC/GW. 0.2ul/100ul. COL#41.

FRN 5881



NAME YOLLA#1, DST#2. BRANCHED CYCLIC FRAGMENTOGRAM.
MISC 6-1-86. GEC/GW. 0.2ul/100ul. COL#41.

FRN 5881

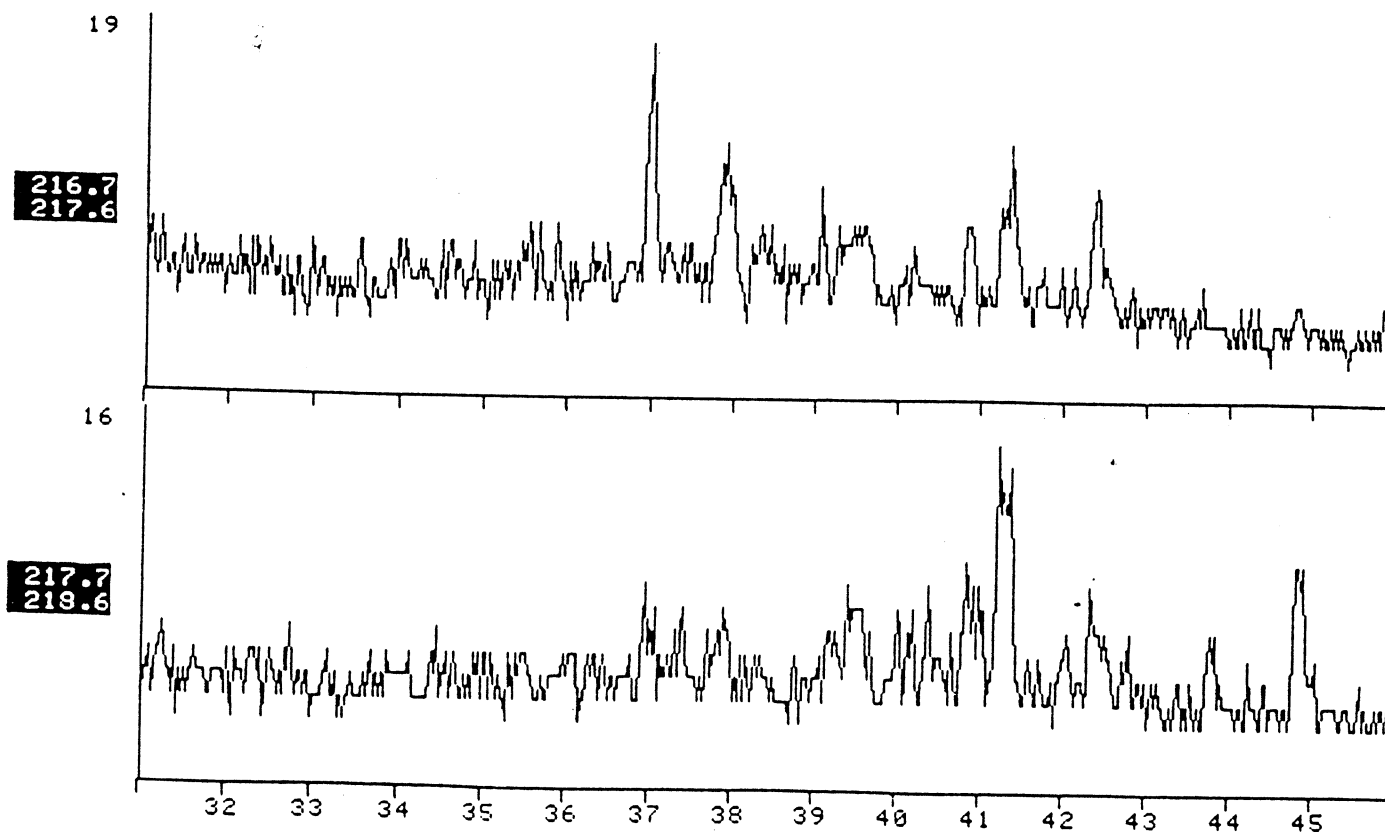
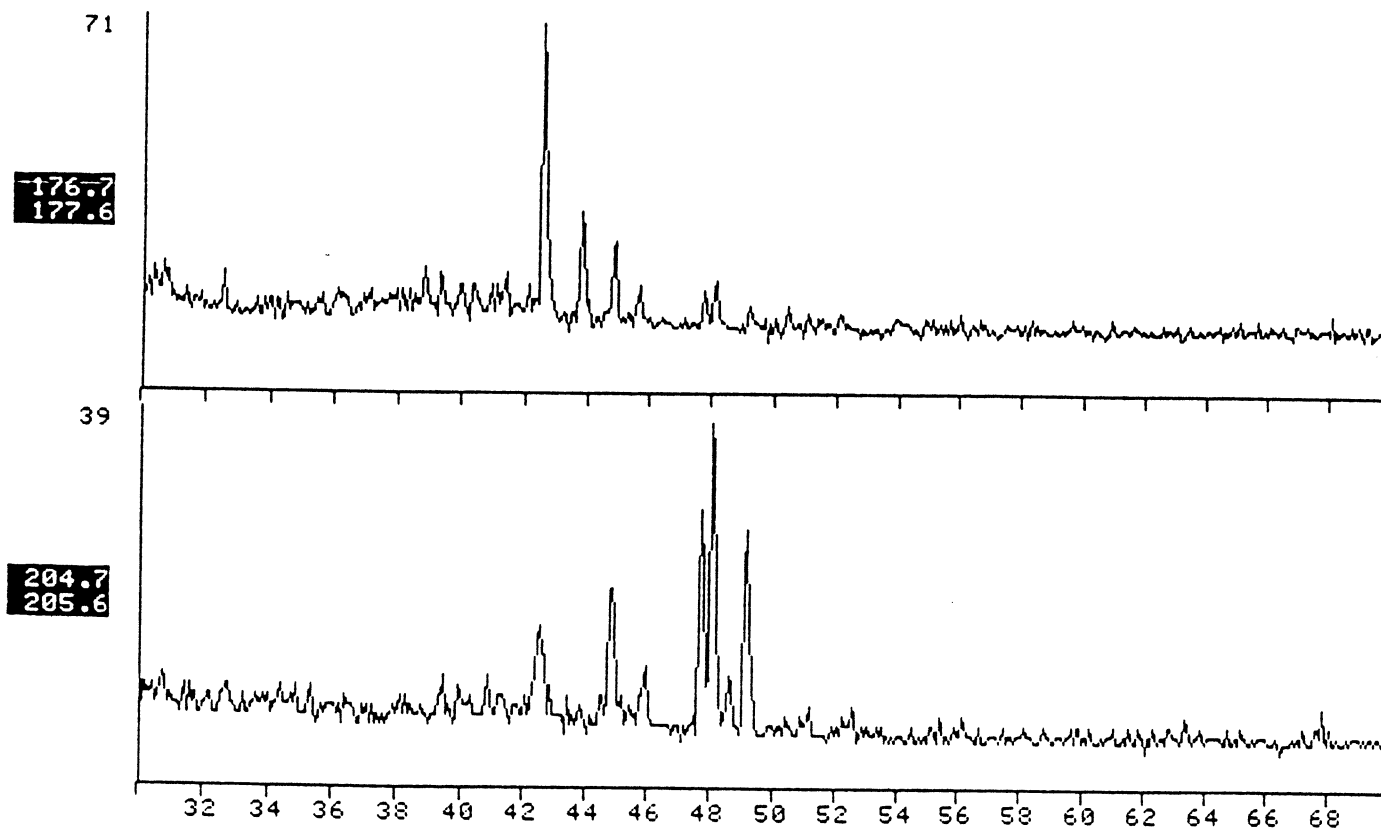


FIGURE 12-5

NAME YOLLA#1, DST#2. BRANCHED CYCLIC FRAGMENTOGRAM.
MISC 6-1-86. GEC/GW. 0.2ul/100ul. COL#41.

FRN 5881



NAME YOLLA#1, DST#2. BRANCHED CYCLIC FRAGMENTOGRAM.
MISC 6-1-86. GEC/GW. 0.2ul/100ul. COL#41.

FRN 5881

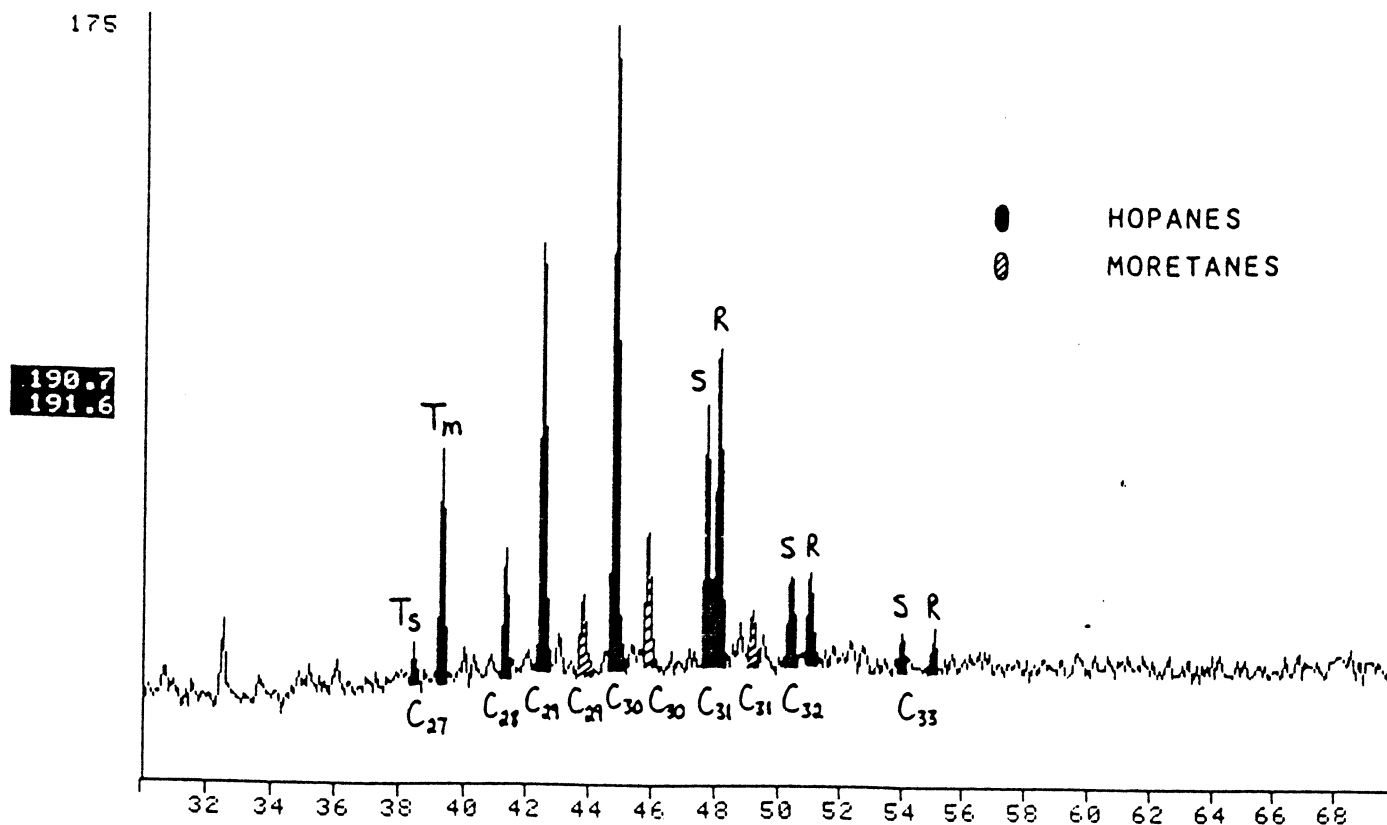
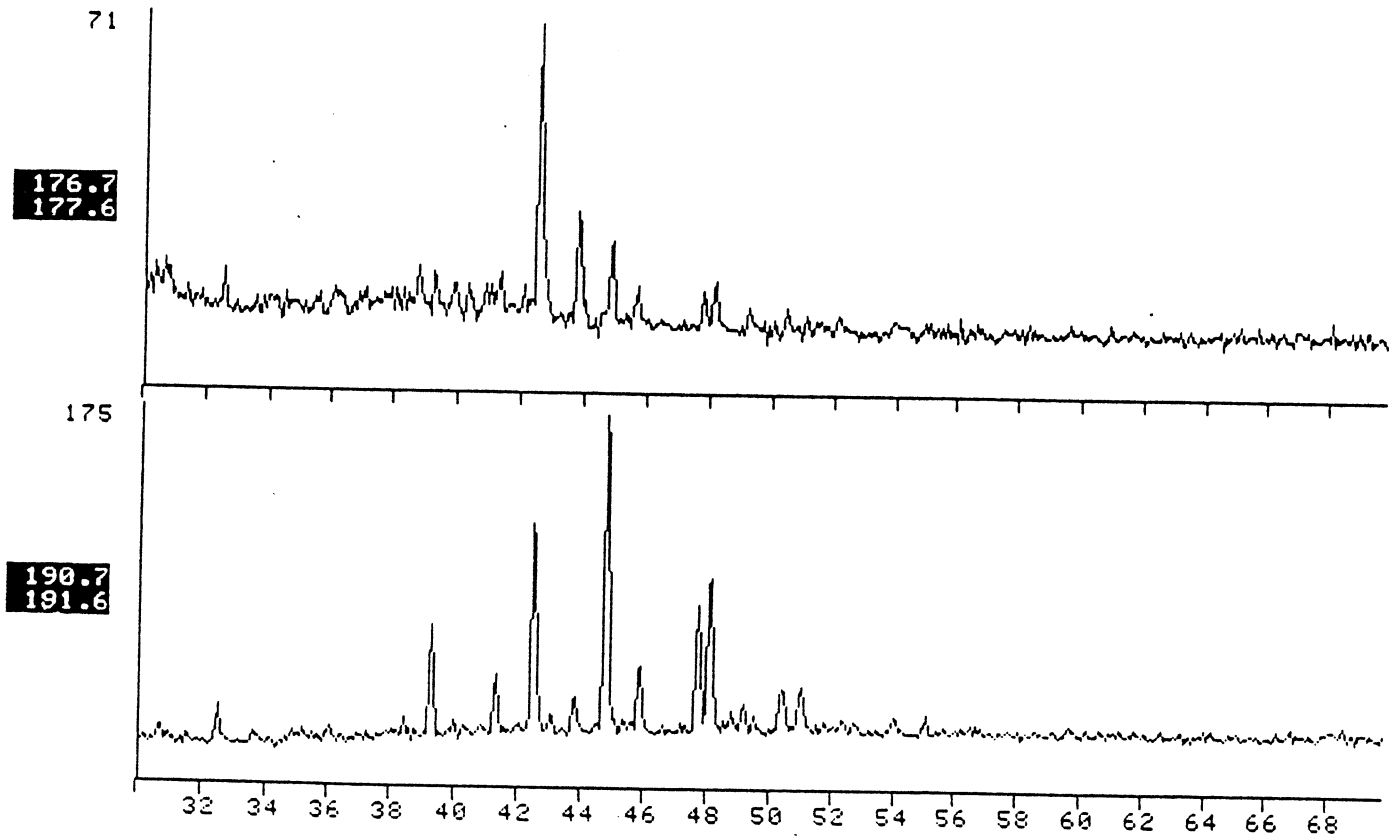


FIGURE 12-6

NAME YOLLA#1, DST#2. BRANCHED CYCLIC FRAGMENTOGRAM.
MISC 6-1-86. GEC/GW. 0.2ul/100ul. COL#41.

FRN 5881



NAME YOLLA#1, DST#2. BRANCHED CYCLIC FRAGMENTOGRAM.
MISC 6-1-86. GEC/GW. 0.2ul/100ul. COL#41.

FRN 5881

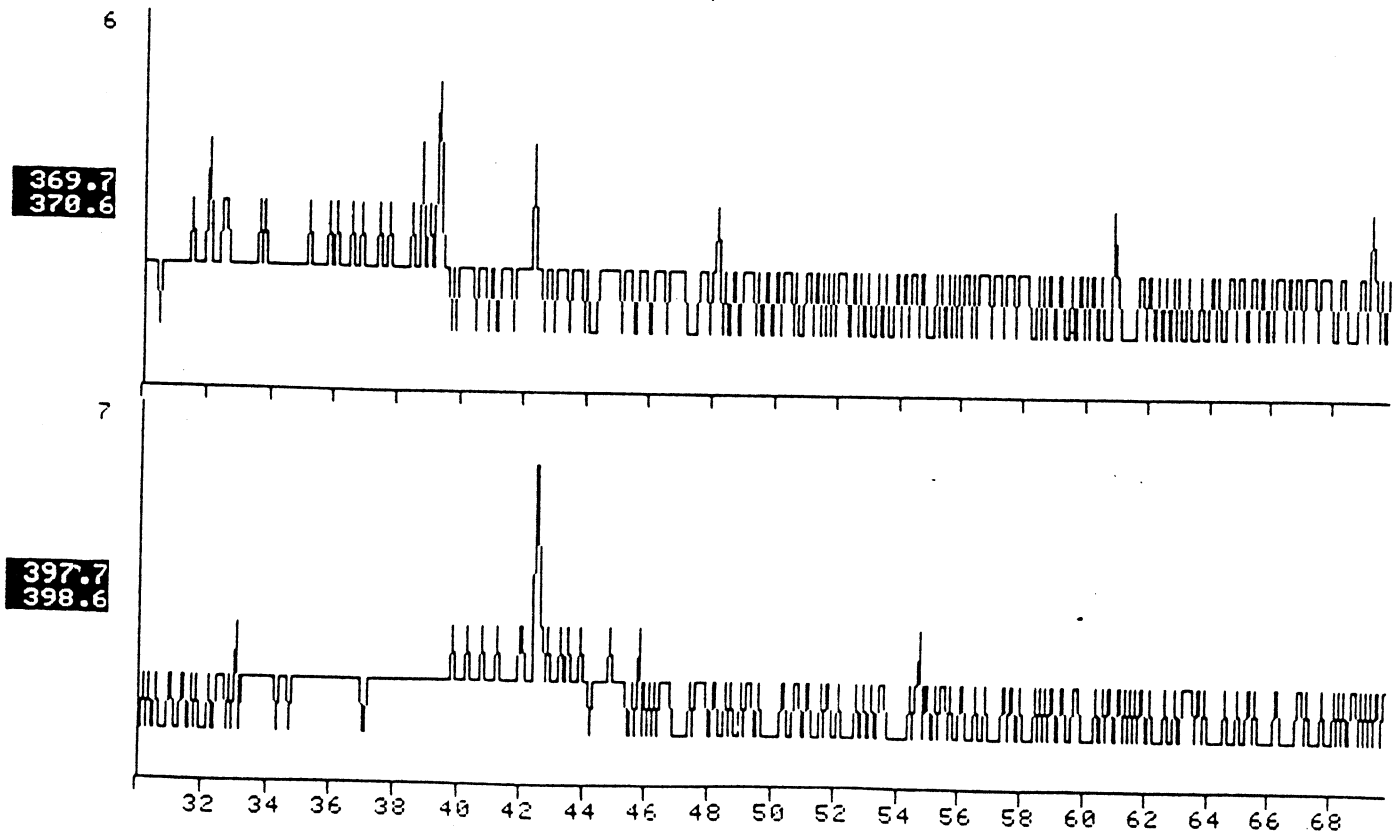
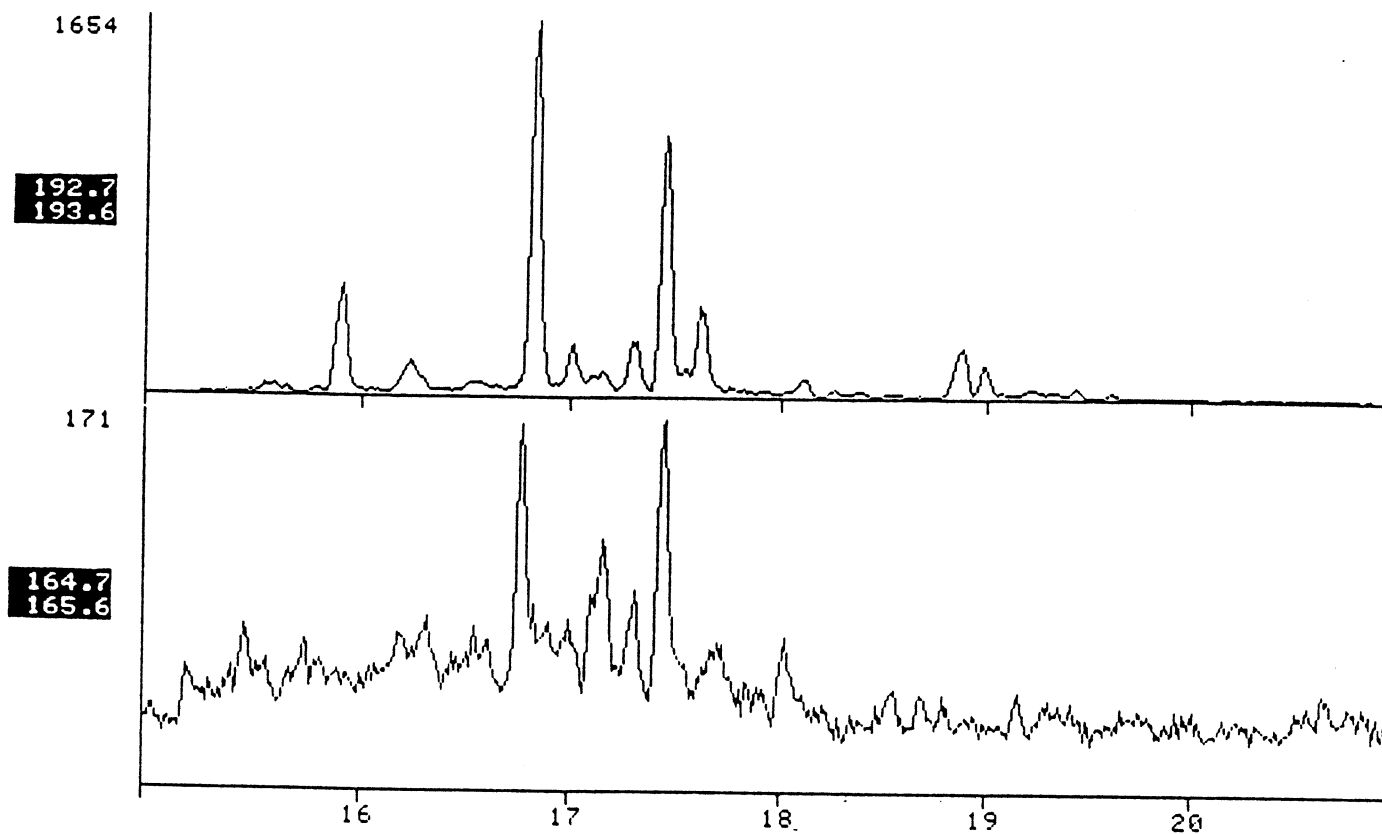


FIGURE 12-7

NAME YOLLA*1, DST*2. BRANCHED CYCLIC FRAGMENTOGRAM.
MISC 6-1-86. GEC/GW. 0.2ul/100ul. COL*41.

FRN 5881



NAME YOLLA*1, DST*2. BRANCHED CYCLIC FRAGMENTOGRAM.
MISC 6-1-86. GEC/GW. 0.2ul/100ul. COL*41.

FRN 5881

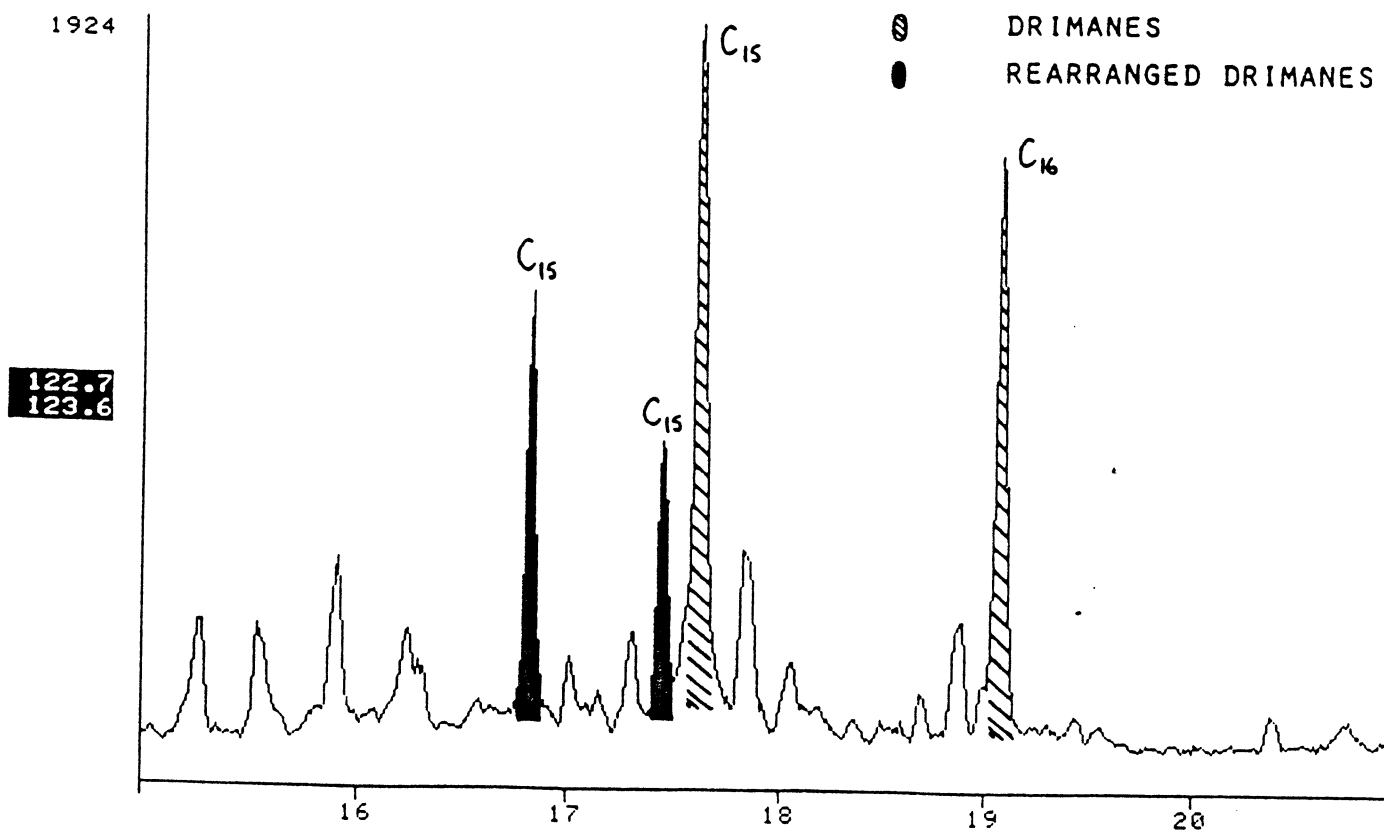
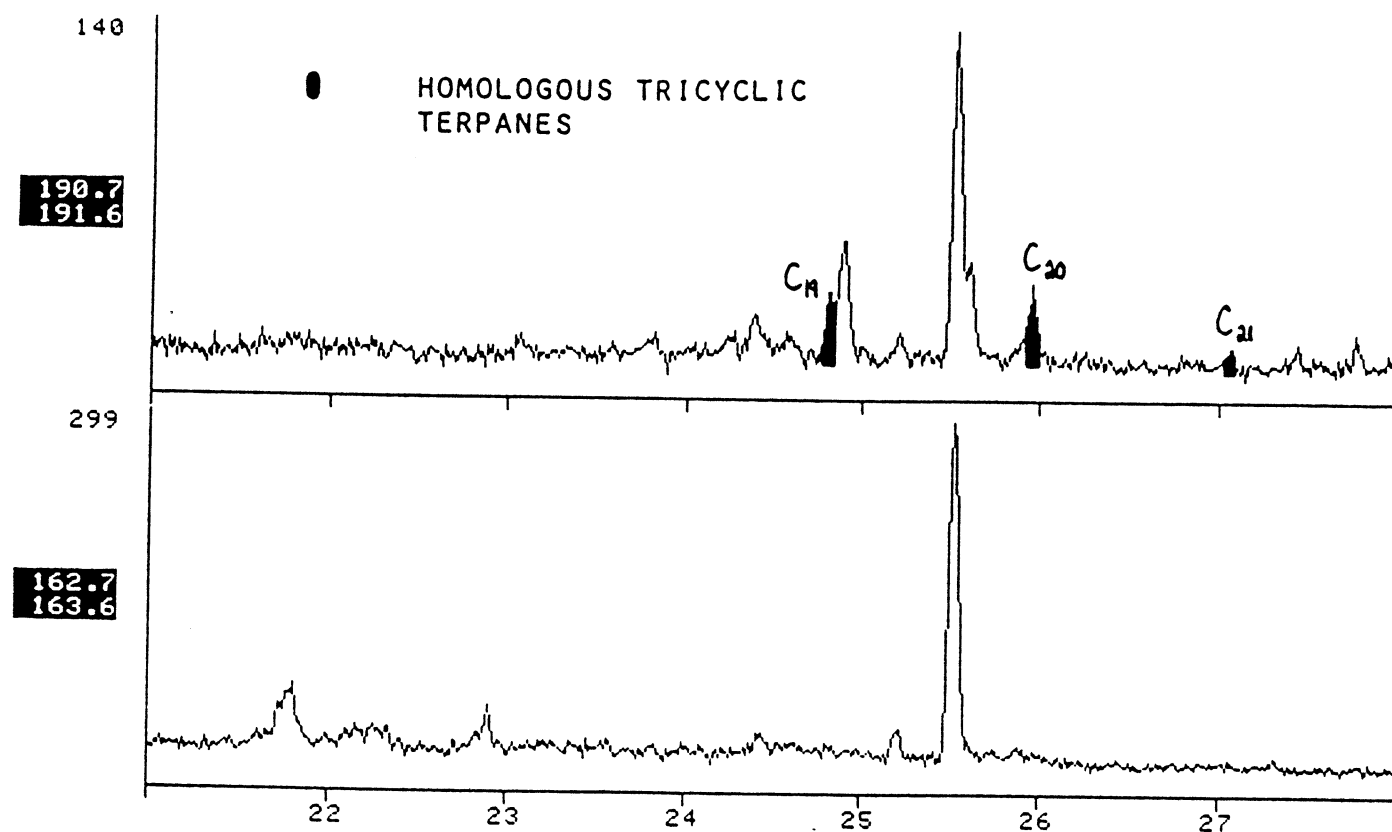


FIGURE 12-8

NAME YOLLA*1, DST#2. BRANCHED CYCLIC FRAGMENTOGRAM.
MISC 6-1-86. GEC/GW. 0.2ul/100ul. COL#41.

FRN 5881



NAME YOLLA*1, DST#2. BRANCHED CYCLIC FRAGMENTOGRAM.
MISC 6-1-86. GEC/GW. 0.2ul/100ul. COL#41.

FRN 5881

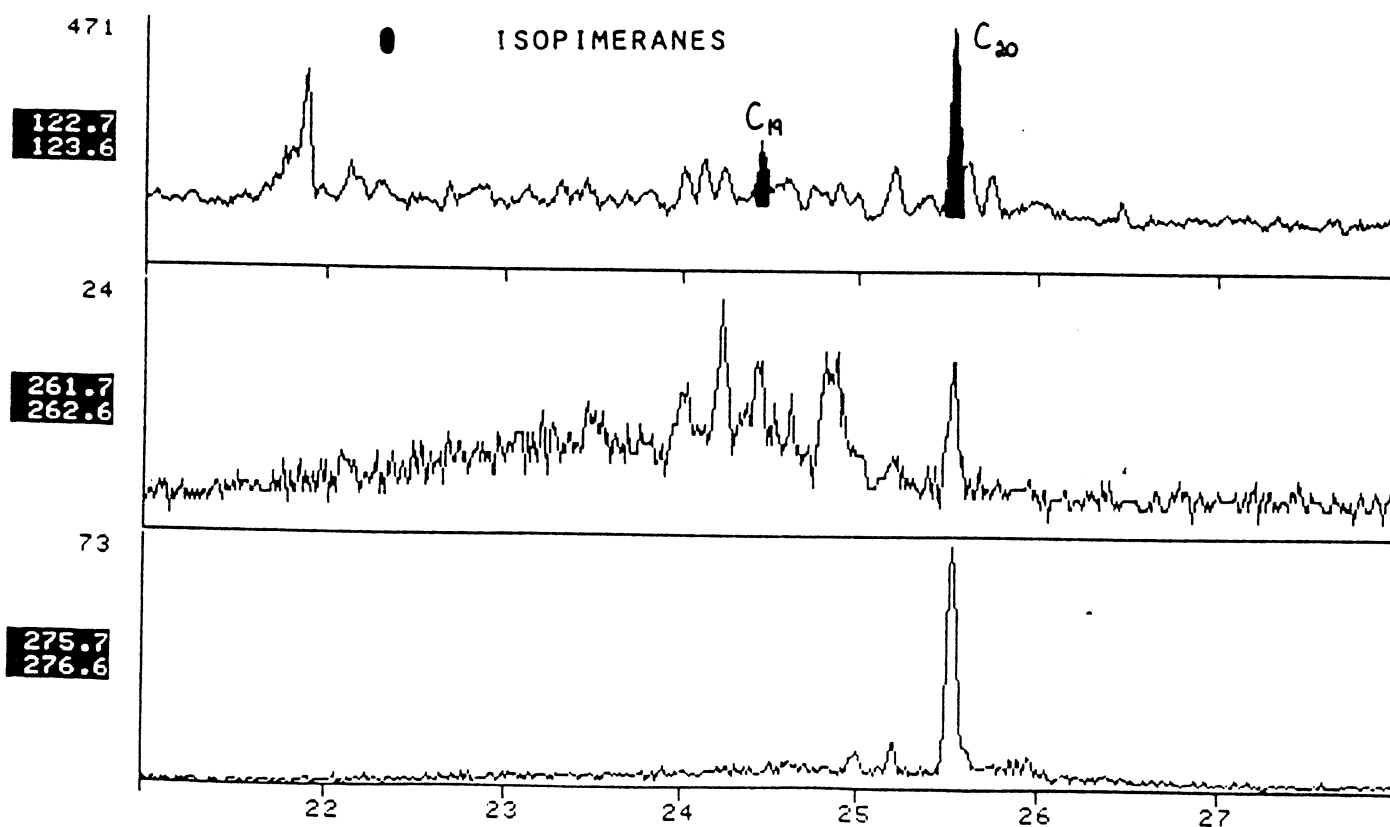
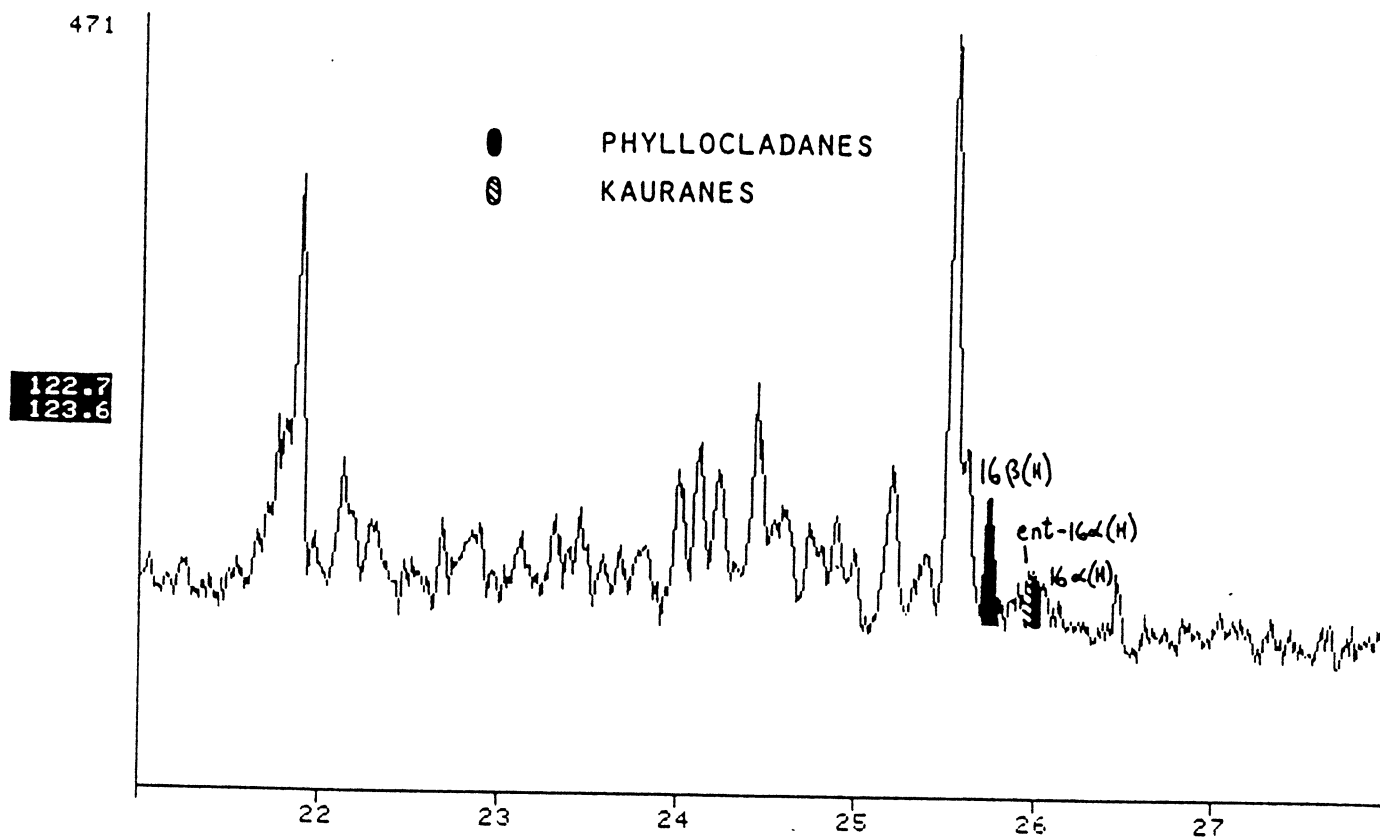


FIGURE 12-9

NAME YOLLA#1, DST#2. BRANCHED CYCLIC FRAGMENTOGRAM.
 MISC 6-1-86. GEC/GW. 0.2ul/100ul. COL#41.

FRN 5881



NAME YOLLA#1, DST#2. BRANCHED CYCLIC FRAGMENTOGRAM.
 MISC 6-1-86. GEC/GW. 0.2ul/100ul. COL#41.

FRN 5881

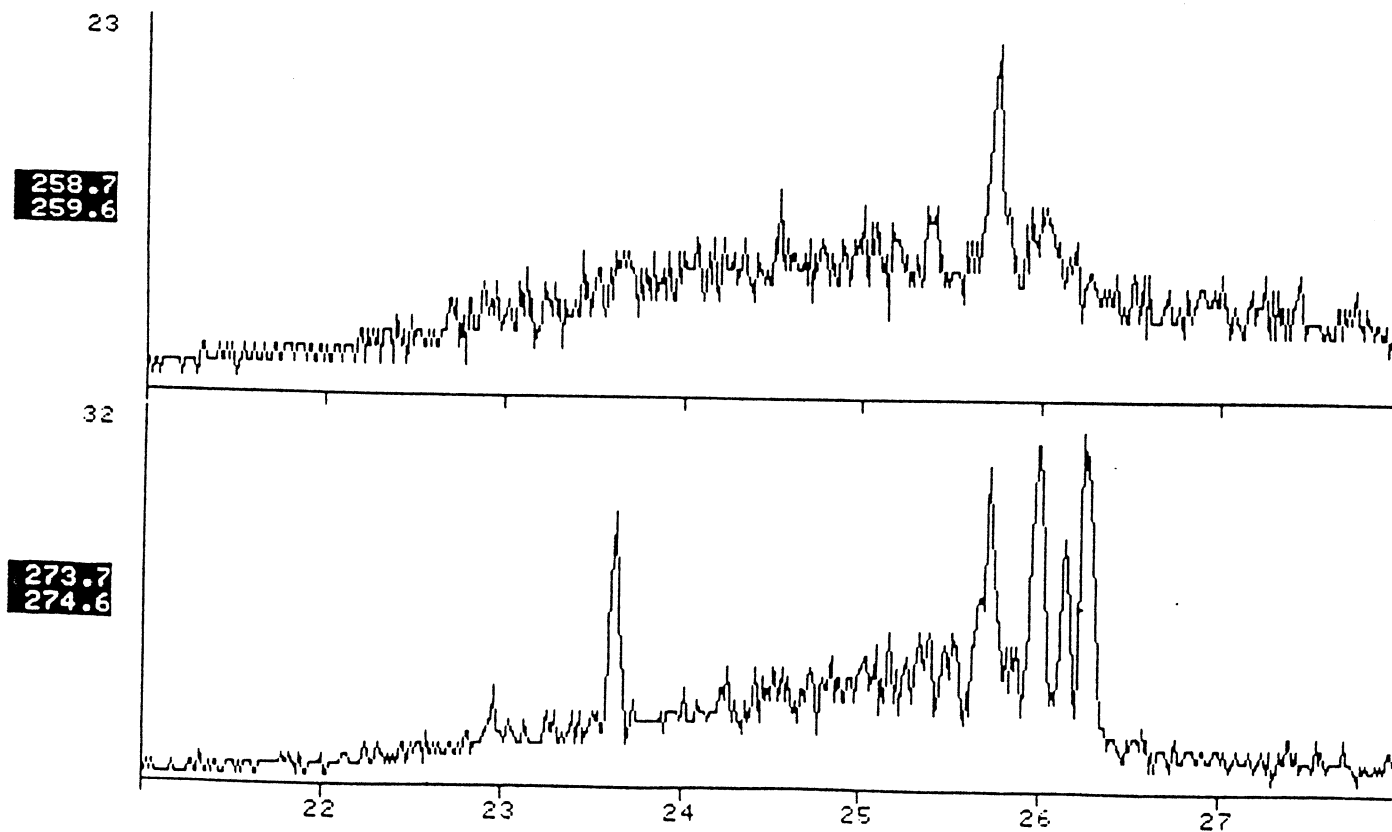
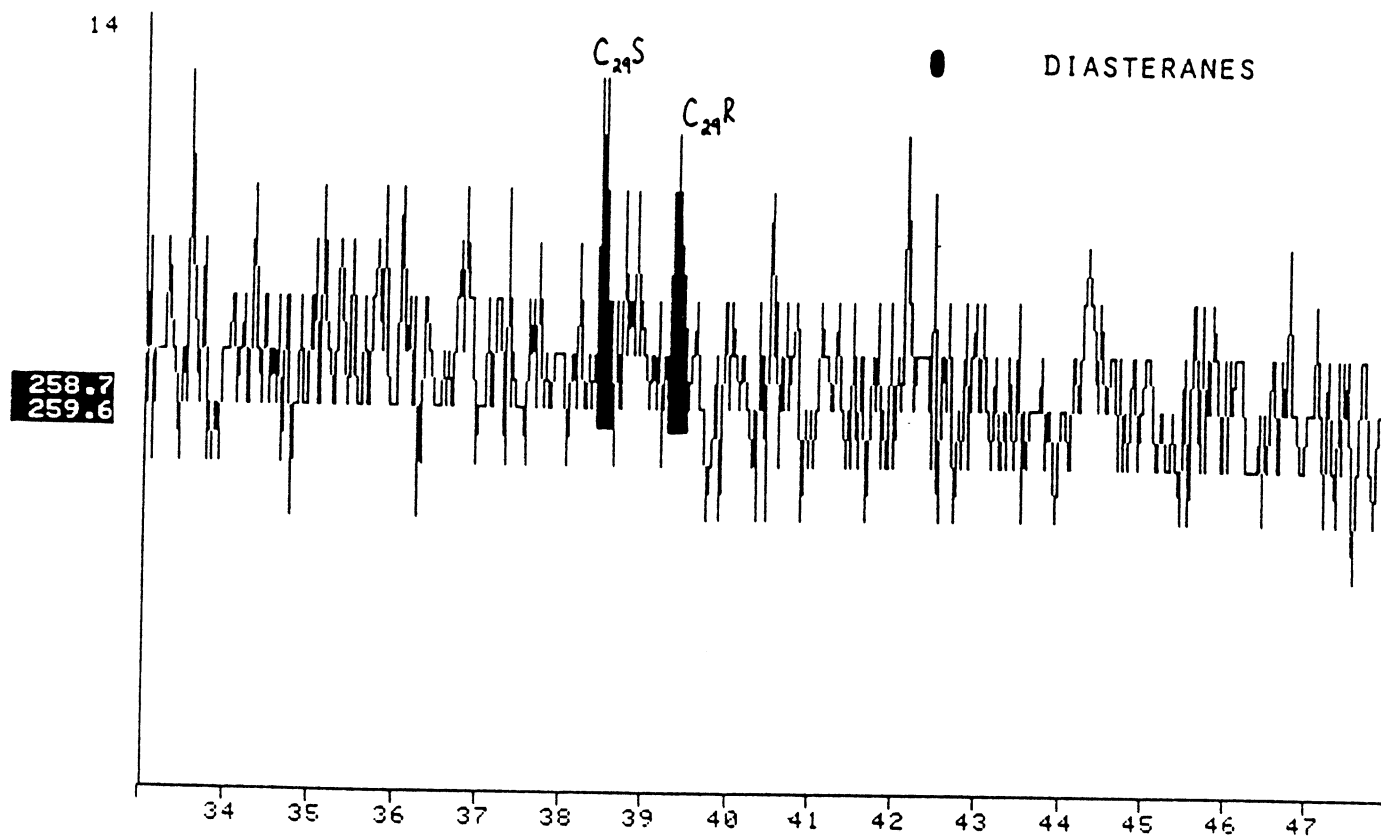


FIGURE 13-1

NAME YOLLA#1, DST#1, 2809-2824.5m. BRANCHED CYCLIC FRAGMENTOGRAM.
MISC 29-10-85. GEC/GW. 0.2ul/100ul. COL#56.

FRN 5838



NAME YOLLA#1, DST#1, 2809-2824.5m. BRANCHED CYCLIC FRAGMENTOGRAM.
MISC 29-10-85. GEC/GW. 0.2ul/100ul. COL#56.

FRN 5838

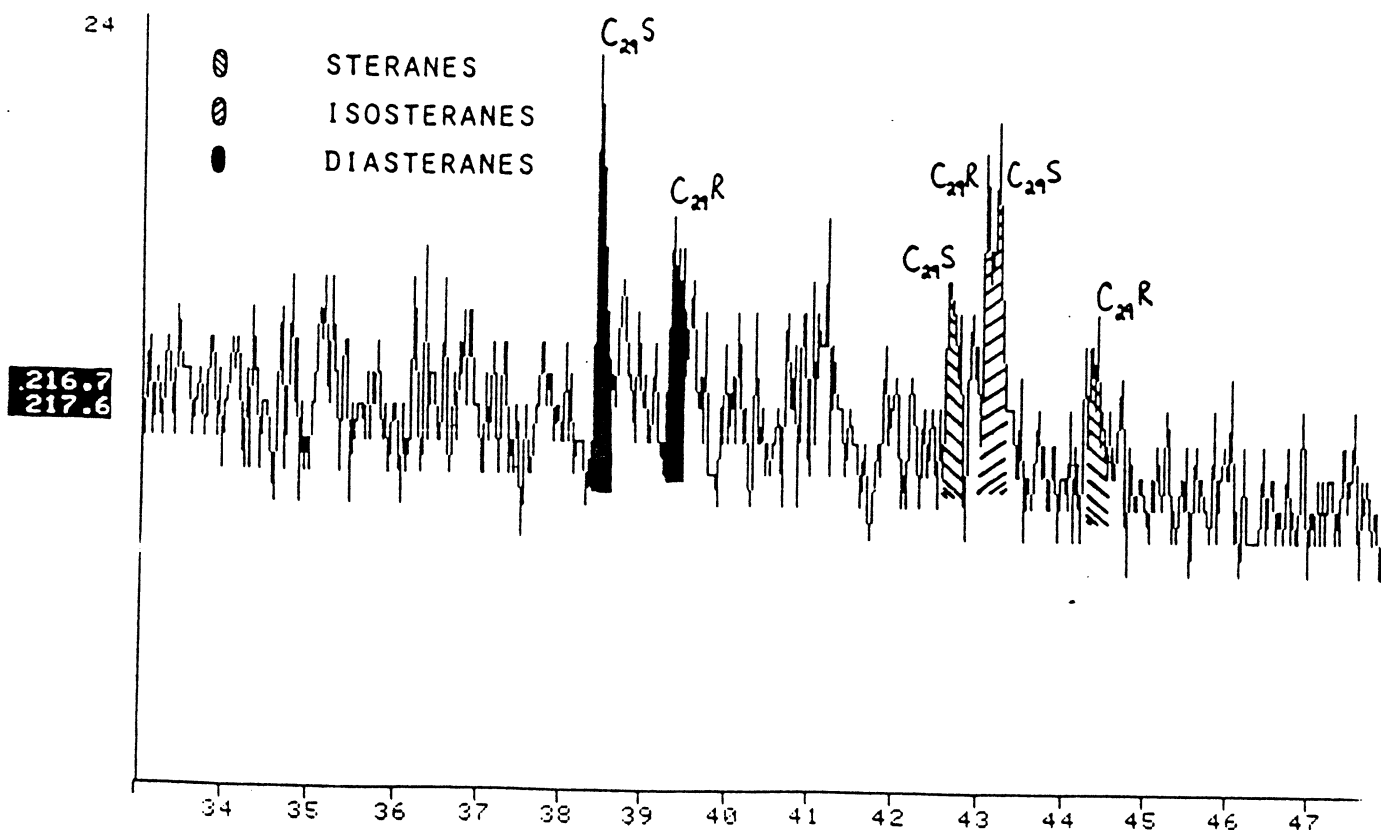


TABLE 1

WELLNAME = YOLLA 1

DATE OF JOB = JANUARY 1986

HEADSPACE ANALYSIS DATA

DEPTH(m)	METHANE	ETHANE	PROPANE	ISOBUTANE	BUTANE	C1-C4	C2-C4	ZWETNESS	C5-C7	i-C4/n-C4
1850.0-1859.0	3527.4	3386.1	4555.0	1352.8	1950.3	14771.6	11244.2	76.1	4296.0	0.69
1868.0-1878.0	33158.8	5880.6	1933.1	348.5	391.9	41712.9	8554.2	20.5	392.0	0.89
1886.0-1895.0	3891.4	1361.4	757.7	182.9	225.9	6419.3	2527.8	39.4	284.6	0.81
1904.0-1913.0	6792.2	1862.0	1037.2	274.0	323.6	10289.1	3496.9	34.0	573.8	0.85
1922.0-1931.0	690.0	850.0	742.5	192.9	248.9	2724.3	2034.3	74.7	980.8	0.78
1940.0-1949.0	6777.1	1123.6	540.9	152.1	137.3	8731.0	1953.8	22.4	109.2	1.11
1958.0-1967.0	60011.8	7431.0	2598.9	477.7	444.8	70964.2	10952.4	15.4	589.5	1.07
1985.0-1994.0	6038.2	2349.4	1413.6	234.5	304.1	10339.8	4301.6	41.6	851.9	0.77
2003.0-2012.0	30375.3	3851.1	1482.4	216.3	214.5	36139.6	5764.3	16.0	340.0	1.01
2021.0-2030.0	39160.7	4864.4	2087.3	357.1	322.8	46792.3	7631.7	16.3	367.4	1.11
2039.0-2048.0	2222.4	670.6	499.7	131.5	98.8	3623.0	1400.7	38.7	104.0	1.33
2057.0-2066.0	1900.9	364.2	260.6	73.3	42.0	2641.0	740.1	28.0	38.2	1.75
2075.0-2084.0	24744.3	2329.9	1111.9	231.4	118.8	28536.3	3792.0	13.3	140.1	1.95
2093.0-2102.0	11323.4	834.6	400.0	105.2	38.8	12702.1	1378.7	10.9	62.8	2.71
2111.0-2120.0	16934.3	1571.6	786.1	182.8	93.0	19567.8	2633.5	13.5	156.4	1.97
2129.0-2138.0	14029.5	2537.8	1290.4	343.3	173.5	18374.3	4344.9	23.6	554.6	1.98
2147.0-2156.0	2421.2	109.7	13.9	3.2	0.5	2548.5	127.3	5.0	0.7	6.06
2165.0-2174.0	161679.	12589.6	2136.9	459.7	93.5	176959.	15279.6	8.6	60.6	4.92
2174.0-2183.0	122665.	4904.0	863.6	257.6	77.9	128768.	6103.1	4.7	77.0	3.30
2192.0-2201.0	37828.8	884.6	394.2	133.6	32.4	39273.7	1444.9	3.7	38.3	4.12
2219.0-2228.0	35338.5	2144.2	450.7	148.0	38.1	38119.4	2781.0	7.3	63.1	3.88
2228.0-2237.0	19098.3	529.6	107.5	33.3	6.6	19775.4	677.0	3.4	8.4	5.02
2246.0-2255.0	13920.6	478.7	85.5	26.3	4.8	14515.9	595.3	4.1	4.7	5.46
2264.0-2273.0	5558.6	1341.0	503.4	209.1	57.4	7669.4	2110.9	27.5	112.4	3.64
2282.0-2291.0	19117.5	2057.2	995.5	402.8	113.1	22686.1	3568.6	15.7	162.3	3.56
2300.0-2309.0	109987.	3808.1	1302.8	456.3	103.9	115658.	5671.0	4.9	107.1	4.39
2318.0-2327.0	10572.9	850.7	537.3	208.8	64.4	12234.1	1661.2	13.6	72.0	3.25
2336.0-2345.0	47144.6	1309.4	353.3	78.7	15.7	48901.7	1757.1	3.6	<0.1	5.02
2354.0-2363.0	33381.0	1606.8	613.5	157.1	80.7	35839.1	2458.1	6.9	60.4	1.95
2372.0-2381.0	13314.8	608.1	267.2	79.0	33.2	14302.3	987.5	6.9	25.4	2.38
2390.0-2399.0	17764.2	2012.2	1395.9	327.3	230.5	21730.1	3965.9	18.3	176.5	1.42
2408.0-2417.0	4983.7	701.8	631.4	159.1	148.2	6624.3	1640.6	24.8	81.3	1.07
2426.0-2435.0	4752.0	716.9	647.8	133.5	112.9	6363.1	1611.2	25.3	80.3	1.18
2444.0-2453.0	37647.8	6737.7	4511.4	865.2	1026.1	50788.2	13140.4	25.9	1628.9	0.84
2462.0-2471.0	130371.	20931.0	4906.6	596.4	526.1	157331.	26960.1	17.1	386.6	1.13
2480.0-2489.0	10484.3	1876.4	1019.0	176.0	171.5	13727.3	3243.0	23.6	214.8	1.03
2498.0-2507.0	3949.7	1160.1	1258.5	242.7	364.8	6975.8	3026.1	43.4	541.7	0.67
2517.0-2526.0	114833.	8795.7	1672.8	64.5	96.8	125463.	10629.9	8.5	<0.1	0.67
2537.0-2546.0	3491.3	707.4	178.6	7.7	8.2	4393.2	901.9	20.5	4.5	0.93
2555.0-2564.0	98439.6	4523.2	362.9	15.5	9.1	103350.	4910.7	4.8	<0.1	1.71
2572.0-2582.0	103868.	5162.3	933.0	92.9	72.0	110128.	6260.2	5.7	31.2	1.29
2591.0-2600.0	7701.3	482.6	114.2	13.5	18.5	8330.1	628.8	7.5	67.4	0.73
2621.0-2630.0	13414.2	968.7	185.2	14.5	14.5	14597.1	1182.9	8.1	<0.1	1.00
2630.0-2639.0	17640.6	1562.6	433.5	40.9	48.2	19725.8	2085.3	10.6	66.8	0.85
2648.0-2657.0	7924.7	516.4	146.2	18.0	22.7	8628.1	703.4	8.2	30.4	0.79
2666.0-2675.0	1699.8	437.6	168.2	20.9	27.2	2353.8	654.0	27.8	21.9	0.77
2684.0-2693.0	767.4	715.3	956.9	227.9	379.6	3047.2	2279.7	74.8	440.0	0.60
2702.0-2711.0	933.8	510.2	507.1	85.4	138.3	2174.8	1241.0	57.1	135.7	0.62

N.B. 1. GAS CONCENTRATIONS EXPRESSED IN PPM (VOL. GAS/VOL. SEDIMENT)
 2. bdl = BELOW DETECTION LIMIT

TABLE 1 (cont)

WELLNAME = YOLLA 1

DATE OF JOB = JANUARY 1986

HEADSPACE ANALYSIS DATA

DEPTH(■)	METHANE	ETHANE	PROPANE	ISOBUTANE	BUTANE	C1-C4	C2-C4	ZWETNESS	C5-C7	i-C4/n-C4
2720.0-2729.0	38176.3	3820.8	1178.8	154.3	176.9	43507.2	5330.8	12.3	153.5	0.87
2738.0-2747.0	5824.9	378.6	125.3	15.9	25.0	6369.7	544.8	8.6	19.8	0.64
2756.0-2765.0	614.7	77.9	31.3	4.7	6.0	734.7	120.0	16.3	7.2	0.78
2774.0-2783.0	2315.4	449.7	179.7	25.8	42.3	3012.9	697.5	23.2	63.7	0.61
2792.0-2801.0	955.9	191.8	113.0	21.6	32.0	1314.3	358.4	27.3	81.7	0.68
2810.0-2819.0	4355.8	875.6	469.5	113.0	130.3	5944.2	1588.4	26.7	304.4	0.87
2828.0-2837.0	75.6	15.9	7.7	1.7	2.1	102.9	27.3	26.5	2.5	0.81
2845.0-2854.0	1073.9	178.7	66.6	11.4	12.0	1342.6	268.7	20.0	11.2	0.95
2863.0-2872.0	1966.5	576.4	370.8	71.0	116.2	3101.0	1134.4	36.6	203.9	0.61
2881.0-2890.0	1751.3	595.6	414.4	75.0	143.0	2979.2	1228.0	41.2	217.9	0.52
2899.0-2908.0	8230.9	1672.9	657.8	82.9	122.8	10767.3	2536.4	23.6	146.3	0.68
2917.0-2926.0	1662.0	418.7	195.1	27.4	46.5	2349.7	687.7	29.3	70.6	0.59
2935.0-2944.0	1789.7	289.8	128.3	20.2	30.6	2258.7	469.0	20.8	49.0	0.66
2953.0-2962.0	405.4	58.3	28.5	6.3	8.1	506.7	101.3	20.0	17.9	0.78
2971.0-2980.0	2390.7	318.9	137.6	23.4	39.6	2910.3	519.6	17.9	68.9	0.59
2989.0-2998.0	11089.6	1339.8	531.9	68.5	104.2	13134.0	2044.4	15.6	124.6	0.66
3007.0-3016.0	26487.0	3494.6	933.0	69.7	115.4	31099.7	4612.7	14.8	54.8	0.60
3025.0-3034.0	1845.0	187.3	56.6	7.6	10.1	2106.6	261.6	12.4	10.8	0.75
3043.0-3052.0	2884.5	436.9	144.0	17.4	34.8	3517.7	633.2	18.0	56.7	0.50
3070.0-3079.0	5584.3	465.3	127.5	16.4	23.0	6216.5	632.2	10.2	33.0	0.71
3079.0-3088.0	2305.0	268.5	83.5	9.8	13.5	2680.3	375.3	14.0	20.6	0.72
3097.0-3106.0	1493.6	311.4	120.3	14.9	21.5	1961.8	468.1	23.9	36.3	0.70
3115.0-3124.0	413.9	56.2	15.8	1.6	2.8	490.3	76.4	15.6	6.2	0.58
3133.0-3142.0	239.3	27.3	7.8	0.8	1.3	276.6	37.3	13.5	4.7	0.59
3151.0-3160.0	586.6	63.0	13.8	1.2	1.8	666.3	79.8	12.0	2.1	0.65
3169.0-3178.0	1030.5	65.0	18.5	3.0	2.1	1119.1	88.6	7.9	2.1	1.42
3187.0-3196.0	249.6	29.9	8.9	1.2	1.3	290.9	41.3	14.2	2.3	0.91
3205.0-3214.0	135.8	19.4	6.6	1.0	1.4	164.2	28.4	17.3	5.0	0.73
3223.0-3232.0	518.0	209.3	113.6	16.4	27.6	884.9	366.9	41.5	112.8	0.59
3241.0-3250.0	16.6	1.3	0.3	0.4	0.6	19.1	2.5	13.2	<0.1	0.65
3259.0-3268.0	373.1	74.1	25.3	3.9	7.1	483.5	110.4	22.8	22.1	0.56
3277.0-3286.0	87.0	16.8	8.5	1.7	2.5	116.5	29.4	25.3	10.7	0.69
3295.0-3304.0	191.5	20.4	8.3	1.3	2.0	223.5	32.0	14.3	10.0	0.64
3313.0-3322.0	86.7	21.3	9.7	0.9	2.0	120.7	34.0	28.2	14.4	0.46
3331.0-3340.0	36.9	16.7	16.6	3.7	4.3	78.3	41.4	52.9	10.7	0.86

N.B. 1. GAS CONCENTRATIONS EXPRESSED IN PPM (VOL. GAS/VOL. SEDIMENT)
 2. bdl = BELOW DETECTION LIMIT

TABLE 2-1
DETAILED GASOLINE RANGE HYDROCARBON (C4-C7) ANALYSIS

Company: AMOCO AUSTRALIA PETROLEUM

Date: 02-10-1985

Sample : YOLLA 1 1850-1859m

COMPOUND	WEIGHT %
isobutane	9.14
n-butane	16.24
isopentane	10.23
n-pentane	10.60
2,2-dimethylbutane	0.32
cyclopentane	0.72
2,3-dimethylbutane	0.97
2-methylpentane	5.08
3-methylpentane	2.68
n-hexane	7.98
methylcyclopentane	3.63
2,4-dimethylpentane	0.52
benzene	0.49
cyclohexane	3.94
1,1-dimethylcyclopentane	0.66
2-methylhexane	2.16
3-methylhexane	2.92
1-cis-3-dimethylcyclopentane	0.86
1-trans-3-dimethylcyclopentane	1.39
1-trans-2-dimethylcyclopentane	0.14
n-heptane	6.62
methylcyclohexane	11.43
1-cis-2-dimethylcyclopentane	0.35
toluene	0.94

PARAFFIN INDEX I = 2.13

PARAFFIN INDEX II = 21.97

TABLE 2-2
DETAILED GASOLINE RANGE HYDROCARBON (C4-C7) ANALYSIS

Company: AMOCO AUSTRALIA PETROLEUM

Date: 02-10-1985

Sample : YOLLA 1 1922-1931m

COMPOUND	WEIGHT %
isobutane	11.85
n-butane	19.73
isopentane	11.59
n-pentane	10.74
2,2-dimethylbutane	0.97
cyclopentane	1.27
2,3-dimethylbutane	0.79
2-methylpentane	3.91
3-methylpentane	2.19
n-hexane	5.07
methylcyclopentane	6.18
2,4-dimethylpentane	0.26
benzene	0.90
cyclohexane	4.18
1,1-dimethylcyclopentane	0.48
2-methylhexane	1.06
3-methylhexane	2.24
1-cis-3-dimethylcyclopentane	1.07
1-trans-3-dimethylcyclopentane	1.93
1-trans-2-dimethylcyclopentane	0.13
n-heptane	2.73
methylcyclohexane	9.12
1-cis-2-dimethylcyclopentane	0.24
toluene	1.37

PARAFFIN INDEX I = 1.06

PARAFFIN INDEX II = 11.88

TABLE 2-3
DETAILED GASOLINE RANGE HYDROCARBON (C4-C7) ANALYSIS

Company: AMOCO AUSTRALIA PETROLEUM

Date: 02-10-85

Sample : YOLLA 1 2444-2453m

COMPOUND	WEIGHT %
isobutane	28.87
n-butane	30.86
isopentane	13.66
n-pentane	8.40
2,2-dimethylbutane	0.22
cyclopentane	0.77
2,3-dimethylbutane	0.65
2-methylpentane	2.87
3-methylpentane	1.45
n-hexane	2.09
methylcyclopentane	2.13
2,4-dimethylpentane	0.14
benzene	0.59
cyclohexane	1.72
1,1-dimethylcyclopentane	0.19
2-methylhexane	0.37
3-methylhexane	0.62
1-cis-3-dimethylcyclopentane	0.25
1-trans-3-dimethylcyclopentane	0.43
1-trans-2-dimethylcyclopentane	0.03
n-heptane	0.54
methylcyclohexane	2.21
1-cis-2-dimethylcyclopentane	0.09
toluene	0.86

PARAFFIN INDEX I = 1.39

PARAFFIN INDEX II = 8.53

TABLE 3

ROCK-EVAL PYROLYSIS DATA (one run)

WELLNAME = YOLLA 1

DATE OF JOB = JANUARY 1986

DEPTH(m)	TMAX	S1	S2	S3	S1+S2	S2/S3	PI	PC	TOC	HI	OI
1680.0-1690.0	425	1.04	2.44	1.55	3.48	1.57	0.30	0.29	2.60	93	59
1710.0-1720.0	428	0.98	3.12	1.47	4.10	2.12	0.24	0.34	3.15	99	46
1730.0-1740.0	427	1.23	4.27	1.25	5.50	3.42	0.22	0.46	3.65	116	34
1765.0 swc	428	0.40	6.25	1.13	6.65	5.53	0.06	0.55	4.60	135	24
1785.0 swc	427	0.68	6.58	0.76	7.26	8.66	0.09	0.60	5.20	126	14
1810.0 swc	428	0.66	2.11	0.66	2.77	3.20	0.24	0.23	2.95	71	22
1886.0-1895.0	424	0.81	6.44	1.54	7.25	4.18	0.11	0.60	3.05	211	50
1904.0-1913.0	425	0.64	5.64	0.77	6.28	7.32	0.10	0.52	2.30	245	33
1922.0-1931.0	426	0.41	4.09	1.05	4.50	3.90	0.09	0.37	1.90	215	55
1958.0-1967.0	427	1.81	20.54	2.42	22.35	8.49	0.08	1.86	8.10	253	29
1985.0-1994.0	427	0.33	2.92	0.51	3.25	5.73	0.10	0.27	1.20	243	42
2021.0-2030.0	427	1.44	24.05	2.26	25.49	10.64	0.06	2.12	8.50	282	26
2039.0-2048.0	425	0.38	4.79	3.43	5.17	1.40	0.07	0.43	2.05	233	167
2075.0-2084.0	429	1.09	22.53	3.42	23.62	6.59	0.05	1.96	9.25	243	36
2111.0-2120.0	426	0.47	7.11	2.40	7.58	2.96	0.06	0.63	3.20	222	75
2129.0-2138.0	429	0.48	6.60	2.31	7.08	2.86	0.07	0.59	3.30	200	70
2165.0-2174.0	429	4.53	95.15	1.54	99.68	61.79	0.05	8.27	30.50	311	5
2174.0-2183.0	427	14.62	150.92	4.44	165.54	33.99	0.09	13.74	46.00	328	9
2219.0-2228.0	430	0.37	7.77	1.02	8.14	7.62	0.05	0.68	3.70	210	27
2264.0-2273.0	428	0.28	4.22	1.28	4.50	3.30	0.06	0.37	1.95	216	65
2282.0-2291.0	431	0.50	8.14	0.76	8.64	10.71	0.06	0.72	2.90	280	26
2300.0-2309.0	433	1.36	23.50	1.21	24.86	19.42	0.05	2.06	7.60	309	15
2354.0-2363.0	429	0.59	8.04	1.10	8.63	7.31	0.07	0.72	3.65	220	30
2390.0-2399.0	432	0.39	3.85	1.51	4.24	2.55	0.09	0.35	2.20	175	68
2444.0-2453.0	434	0.41	3.56	1.07	3.97	3.33	0.10	0.33	2.35	151	45
2462.0-2471.0	449	6.01	54.38	1.79	60.39	30.38	0.10	5.01	22.60	240	7
2498.0-2507.0	453	0.57	1.32	2.08	1.89	0.63	0.30	0.16	1.40	94	148
2517.0-2526.0	518	2.78	8.00	0.81	10.78	9.88	0.26	0.89	17.75	45	4
2573.0-2582.0	444	9.80	110.98	5.09	120.78	21.80	0.08	10.02	47.00	236	10
2684.0-2693.0	470	0.46	0.75	1.55	1.21	0.48	0.38	0.10	1.30	57	119
2702.0-2711.0	456	0.39	0.93	1.23	1.32	0.76	0.30	0.11	1.25	74	98
2720.0-2729.0	444	0.93	5.62	0.50	6.55	11.24	0.14	0.54	4.90	114	10
2774.0-2783.0	nd	nd	nd	nd	nd	nd	nd	nd	0.63	nd	nd
2810.0-2819.0	nd	nd	nd	nd	nd	nd	nd	nd	0.68	nd	nd
2863.0-2872.0	443	0.30	1.02	1.30	1.32	0.78	0.23	0.11	1.10	92	118
2881.0-2890.0	445	0.39	1.21	1.08	1.60	1.12	0.24	0.13	1.35	89	80
2899.0-2908.0	442	0.17	0.85	0.56	1.02	1.52	0.17	0.08	1.30	65	43
2935.0-2944.0	nd	nd	nd	nd	nd	nd	nd	nd	0.89	nd	nd
2989.0-2998.0	441	0.24	1.29	1.36	1.53	0.95	0.16	0.13	1.35	95	100
3007.0-3016.0	448	1.70	12.50	0.69	14.20	18.12	0.12	1.18	6.50	192	10

TMAX = Max. temperature S2

S1+S2 = Potential yield

PC = Pyrolysable carbon

OI = Oxygen Index

S1 = Volatile hydrocarbons (HC)

S3 = Organic carbon dioxide

TOC = Total organic carbon

nd = no data

S2 = HC generating potential

PI = Production index

HI = Hydrogen index

swc = Sidewall Core

TABLE 4

Summary of Extraction and Liquid Chromatography

Wellname: YOLLA 1

Date of Job: JANUARY 1986

A. Concentrations of Extracted Material

Depth(m)	Weight of Rock Extd. (grams)	Total Extract (ppm)	Loss on Column (ppm)	-----Hydrocarbons-----			-----Nonhydrocarbons-----		
				Saturates (ppm)	Aromatics (ppm)	HC Total (ppm)	MSO's (ppm)	Asphaltenes (ppm)	NonHC Total (ppm)
1785.0 swc	8.5	1482.4	458.8	247.1	223.5	470.6	552.9	nd	552.9
1958.0-1967.0	47.0	2574.5	896.5	605.5	478.9	1084.3	593.6	nd	593.6
2021.0-2030.0	49.0	2091.8	492.0	544.4	558.7	1103.1	496.7	nd	496.7
2075.0-2084.0	42.0	1811.9	428.6	371.4	511.9	883.3	500.0	nd	500.0
2174.0-2183.0	24.7	9882.6	1926.6	1810.2	3173.4	4983.6	2972.3	nd	2972.3
2300.0-2309.0	42.9	2463.9	488.6	681.0	722.5	1403.5	571.8	nd	571.8
2462.0-2471.0	35.6	6233.1	1342.8	2228.3	1262.0	3490.3	1400.1	nd	1400.1
2517.0-2526.0	33.1	3081.6	964.0	763.3	955.3	1718.6	398.9	nd	398.9
2573.0-2582.0	20.1	7338.3	2364.1	2080.3	1555.1	3635.4	1338.8	nd	1338.8
3007.0-3016.0	38.2	2646.6	721.1	664.4	566.0	1230.4	695.2	nd	695.2

TABLE 4

Summary of Extraction and Liquid Chromatography

Wellname: YOLLA 1

Date of Job: JANUARY 1986

B. Compositional Data

Depth(m)	-----Hydrocarbons-----			-----Nonhydrocarbons-----			EDM(mg)	SAT(mg)	SAT	ASPH	HC
	ISAT.	IAROM.	IHC's	IMSOS	IASPH.	IMon HC's	TOC(g)	TOC(g)	AROM	MSO	Non HC
1785.0 swc	24.1	21.8	46.0	54.0	nd	54.0	28.5	4.8	1.11	nd	.9
1958.0-1967.0	36.1	28.5	64.6	35.4	nd	35.4	31.8	7.5	1.26	nd	1.8
2021.0-2030.0	34.0	34.9	69.0	31.0	nd	31.0	24.6	6.4	.97	nd	2.2
2075.0-2084.0	26.9	37.0	63.9	36.1	nd	36.1	19.6	4.0	.73	nd	1.8
2174.0-2183.0	22.8	39.9	62.6	37.4	nd	37.4	21.5	3.9	.57	nd	1.7
2300.0-2309.0	34.5	36.6	71.1	28.9	nd	28.9	32.4	9.0	.94	nd	2.5
2462.0-2471.0	45.6	25.8	71.4	28.6	nd	28.6	27.6	9.9	1.77	nd	2.5
2517.0-2526.0	36.0	45.1	81.2	18.8	nd	18.8	17.4	4.3	.80	nd	4.3
2573.0-2582.0	41.8	31.3	73.1	26.9	nd	26.9	15.6	4.4	1.34	nd	2.7
3007.0-3016.0	34.5	29.4	63.9	36.1	nd	36.1	40.7	10.2	1.17	nd	1.8

na = not applicable nd = no data

TABLE 5

Summary of Gas Chromatography Data

Wellname: YOLLA 1

Date of Job: JANUARY 1986

A. Alkane Compositional Data

Depth(m)	Prist./Phyt.	Prist./n-C17	Phyt./n-C18	CPI(1)	CPI(2)	(C21+C22)/(C28+C29)
1785.0 swc	7.79	3.35	.68	1.52	1.56	1.94
1958.0-1967.0	10.25	4.39	.48	1.31	1.35	1.93
2021.0-2030.0	7.88	1.71	.20	1.34	1.33	7.72
2075.0-2084.0	10.50	6.18	.63	1.30	1.28	.79
2174.0-2183.0	12.78	6.53	.67	1.39	1.39	.90
2300.0-2309.0	11.26	8.44	.87	1.12	1.17	.64
2462.0-2471.0	7.93	1.92	.29	1.15	1.12	1.34
2517.0-2526.0	3.86	.43	.12	1.05	1.03	6.53
2573.0-2582.0	10.30	1.78	.21	1.17	1.15	2.47
3007.0-3016.0	6.88	.96	.14	1.06	1.05	6.57

TABLE 5

Summary of Gas Chromatography Data

Wellname: YOLLA 1

Date of Job: JANUARY 1986

B. n-Alkane Distributions

DEPTH(m)	nC12	nC13	nC14	nC15	nC16	nC17	iC19	nC18	iC20	nC19	nC20	nC21	nC22	nC23	nC24	nC25	nC26	nC27	nC28	nC29	nC30	nC31
1785.0 swc	15.4	13.3	11.4	9.7	6.1	4.2	14.2	2.7	1.8	2.2	1.8	1.9	2.0	2.5	1.9	2.6	1.4	1.8	.8	1.2	.7	.4
1958.0-1967.0	7.8	7.5	7.1	5.3	5.1	5.5	24.1	4.9	2.4	4.3	3.5	2.9	2.4	2.5	2.5	3.3	2.2	2.9	1.4	1.4	.8	.2
2021.0-2030.0	5.2	5.7	5.6	6.0	6.1	7.7	13.2	8.2	1.7	8.3	7.4	6.2	4.6	3.5	2.6	2.7	1.7	1.9	.7	.7	.3	.2
2075.0-2084.0	6.9	6.0	5.0	4.1	3.2	3.0	18.6	2.8	1.8	2.8	2.8	3.2	3.4	3.9	4.2	5.1	4.6	6.7	3.7	4.6	2.1	1.4
2174.0-2183.0	3.0	3.7	3.3	4.1	2.7	3.3	21.7	2.5	1.7	2.9	2.9	3.5	3.9	4.5	4.7	5.9	5.2	9.4	4.1	4.1	1.9	1.1
2300.0-2309.0	3.6	3.4	2.9	3.2	2.2	2.5	21.3	2.2	1.9	2.5	2.7	3.2	3.6	4.4	4.8	6.0	5.7	7.4	5.2	5.4	4.0	2.0
2462.0-2471.0	2.7	3.4	3.9	4.5	3.9	4.3	8.3	3.6	1.1	4.1	4.1	4.8	5.5	6.3	7.1	7.8	6.9	7.8	4.3	3.4	1.3	.7
2517.0-2526.0	8.6	8.6	8.7	8.1	7.3	7.3	3.2	7.0	.8	6.6	6.0	5.5	4.9	4.4	3.7	3.2	2.4	1.8	1.0	.6	.2	.1
2573.0-2582.0	3.9	4.9	5.3	5.8	4.7	5.2	9.3	4.2	.9	4.8	4.6	5.2	5.7	6.2	6.3	6.8	5.3	5.4	2.5	1.9	.6	.3
3007.0-3016.0	6.4	6.6	6.4	6.6	6.1	6.6	6.3	6.7	.9	6.7	6.5	6.2	5.9	5.5	4.8	4.1	3.0	2.2	1.2	.7	.3	.1

na = not applicable nd = no data

TABLE 6-1

ALKANE AND ALKENE COMPONENT ANALYSIS FROM PYROLYSIS-6C

Well name: YOLLA 1

Date: 1986

Sample: 1785m SWC

Carbon No.	-----Alkane + Alkene-----			-----Alkane-----			-----Alkene-----			Alkane/Alkene
	A	B	C	A	B	C	A	B	C	
1	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
2	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
3	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
4	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
5	2.006	0.1320	0.0254	0.640	0.0421	0.0081	1.366	0.0899	0.0173	0.47
6	2.029	0.1335	0.0257	0.551	0.0363	0.0070	1.478	0.0973	0.0187	0.37
7	1.394	0.0917	0.0176	0.528	0.0347	0.0067	0.866	0.0570	0.0110	0.61
8	1.054	0.0694	0.0133	0.460	0.0303	0.0058	0.594	0.0391	0.0075	0.77
9	0.887	0.0584	0.0112	0.344	0.0226	0.0044	0.543	0.0357	0.0069	0.63
10	0.950	0.0625	0.0120	0.315	0.0207	0.0040	0.635	0.0418	0.0080	0.50
11	0.801	0.0527	0.0101	0.337	0.0222	0.0043	0.464	0.0305	0.0059	0.73
12	0.894	0.0588	0.0113	0.427	0.0281	0.0054	0.467	0.0307	0.0059	0.91
13	0.967	0.0636	0.0122	0.473	0.0311	0.0060	0.494	0.0325	0.0063	0.96
14	1.238	0.0815	0.0157	0.744	0.0490	0.0094	0.494	0.0325	0.0063	1.51
15	0.976	0.0642	0.0124	0.425	0.0280	0.0054	0.551	0.0363	0.0070	0.77
16	0.916	0.0603	0.0116	0.417	0.0274	0.0053	0.499	0.0328	0.0063	0.84
17	0.568	0.0374	0.0072	0.275	0.0181	0.0035	0.293	0.0193	0.0037	0.94
18	0.561	0.0369	0.0071	0.262	0.0172	0.0033	0.299	0.0197	0.0038	0.88
19	0.501	0.0330	0.0063	0.206	0.0136	0.0026	0.295	0.0194	0.0037	0.70
20	0.391	0.0257	0.0049	0.196	0.0129	0.0025	0.195	0.0128	0.0025	1.01
21	0.387	0.0255	0.0049	0.208	0.0137	0.0026	0.179	0.0118	0.0023	1.16
22	0.428	0.0282	0.0054	0.226	0.0149	0.0029	0.202	0.0133	0.0026	1.12
23	0.337	0.0222	0.0043	0.202	0.0133	0.0026	0.135	0.0089	0.0017	1.50
24	0.316	0.0208	0.0040	0.184	0.0121	0.0023	0.132	0.0087	0.0017	1.39
25	0.299	0.0197	0.0038	0.182	0.0120	0.0023	0.117	0.0077	0.0015	1.56
26	0.270	0.0178	0.0034	0.158	0.0104	0.0020	0.112	0.0074	0.0014	1.41
27	0.232	0.0153	0.0029	0.143	0.0094	0.0018	0.089	0.0059	0.0011	1.61
28	0.180	0.0118	0.0023	0.116	0.0076	0.0015	0.064	0.0042	0.0008	1.81
29	0.193	0.0127	0.0024	0.145	0.0095	0.0018	0.048	0.0032	0.0006	3.02
30	0.188	0.0124	0.0024	0.135	0.0089	0.0017	0.053	0.0035	0.0007	2.55
31	0.093	0.0061	0.0012	0.071	0.0047	0.0009	0.022	0.0014	0.0003	3.23

nd = no data
 A = % of S₂
 B = mg/g Rock
 C = (mg/g Rock)/TOC

TABLE 6-2

ALKANE AND ALKENE COMPONENT ANALYSIS FROM PYROLYSIS-GC

Well name: YOLLA 1

Date: 1986

Sample: 1958-1967a

Carbon No.	---Alkane + Alkene---			-----Alkane-----			-----Alkene-----			Alkane/Alkene
	A	B	C	A	B	C	A	B	C	
1	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
2	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
3	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
4	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
5	1.993	0.4094	0.0505	0.691	0.1419	0.0175	1.302	0.2674	0.0330	0.53
6	1.948	0.4001	0.0494	0.538	0.1105	0.0136	1.410	0.2896	0.0358	0.38
7	1.286	0.2641	0.0326	0.505	0.1037	0.0128	0.781	0.1604	0.0198	0.65
8	0.913	0.1875	0.0232	0.365	0.0750	0.0093	0.548	0.1126	0.0139	0.67
9	0.873	0.1793	0.0221	0.345	0.0709	0.0087	0.528	0.1085	0.0134	0.65
10	0.974	0.2001	0.0247	0.241	0.0495	0.0061	0.733	0.1506	0.0186	0.33
11	0.807	0.1658	0.0205	0.308	0.0633	0.0078	0.499	0.1025	0.0127	0.62
12	0.696	0.1430	0.0176	0.283	0.0581	0.0072	0.413	0.0848	0.0105	0.69
13	0.416	0.0854	0.0105	0.199	0.0409	0.0050	0.217	0.0446	0.0055	0.92
14	0.393	0.0807	0.0100	0.232	0.0477	0.0059	0.161	0.0331	0.0041	1.44
15	0.381	0.0783	0.0097	0.150	0.0308	0.0038	0.231	0.0474	0.0059	0.65
16	0.193	0.0396	0.0049	0.102	0.0210	0.0026	0.091	0.0187	0.0023	1.12
17	0.278	0.0571	0.0070	0.130	0.0267	0.0033	0.148	0.0304	0.0038	0.88
18	0.177	0.0364	0.0045	0.092	0.0189	0.0023	0.085	0.0175	0.0022	1.08
19	0.211	0.0433	0.0054	0.103	0.0212	0.0026	0.108	0.0222	0.0027	0.95
20	0.169	0.0347	0.0043	0.092	0.0189	0.0023	0.077	0.0158	0.0020	1.19
21	0.187	0.0384	0.0047	0.115	0.0236	0.0029	0.072	0.0148	0.0018	1.60
22	0.206	0.0423	0.0052	0.107	0.0220	0.0027	0.099	0.0203	0.0025	1.08
23	0.228	0.0468	0.0058	0.130	0.0267	0.0033	0.098	0.0201	0.0025	1.33
24	0.265	0.0544	0.0067	0.163	0.0335	0.0041	0.102	0.0210	0.0026	1.60
25	0.274	0.0563	0.0069	0.169	0.0347	0.0043	0.105	0.0216	0.0027	1.61
26	0.244	0.0501	0.0062	0.157	0.0322	0.0040	0.087	0.0179	0.0022	1.80
27	0.232	0.0477	0.0059	0.143	0.0294	0.0036	0.089	0.0183	0.0023	1.61
28	0.173	0.0355	0.0044	0.116	0.0238	0.0029	0.057	0.0117	0.0014	2.04
29	0.179	0.0368	0.0045	0.126	0.0259	0.0032	0.053	0.0109	0.0013	2.38
30	0.084	0.0173	0.0021	0.062	0.0127	0.0016	0.022	0.0045	0.0006	2.82
31	0.035	0.0072	0.0009	0.022	0.0045	0.0006	0.013	0.0027	0.0003	1.69

nd = no data

A = % of S2

B = mg/g Rock

C = (mg/g Rock)/TOC

TABLE 6-3

ALKANE AND ALKENE COMPONENT ANALYSIS FROM PYROLYSIS-GC

Well name: YOLLA 1

Date: 1986

Sample: 2021-2030m

Carbon No.	-----Alkane + Alkene-----			-----Alkane-----			-----Alkene-----			Alkane/Alkene
	A	B	C	A	B	C	A	B	C	
1	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
2	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
3	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
4	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
5	2.263	0.5443	0.0640	0.842	0.2025	0.0238	1.421	0.3418	0.0402	0.59
6	2.176	0.5233	0.0616	0.636	0.1530	0.0180	1.540	0.3704	0.0436	0.41
7	1.429	0.3437	0.0404	0.587	0.1412	0.0166	0.842	0.2025	0.0238	0.70
8	1.064	0.2559	0.0301	0.417	0.1003	0.0118	0.647	0.1556	0.0183	0.64
9	0.910	0.2189	0.0257	0.380	0.0914	0.0108	0.530	0.1275	0.0150	0.72
10	0.917	0.2205	0.0259	0.390	0.0938	0.0110	0.527	0.1267	0.0149	0.74
11	0.898	0.2160	0.0254	0.284	0.0683	0.0080	0.614	0.1477	0.0174	0.46
12	0.590	0.1419	0.0167	0.233	0.0560	0.0066	0.357	0.0859	0.0101	0.65
13	0.678	0.1631	0.0192	0.325	0.0782	0.0092	0.353	0.0849	0.0100	0.92
14	0.702	0.1688	0.0199	0.352	0.0847	0.0100	0.350	0.0842	0.0099	1.01
15	0.723	0.1739	0.0205	0.251	0.0604	0.0071	0.472	0.1135	0.0134	0.53
16	0.410	0.0986	0.0116	0.191	0.0459	0.0054	0.219	0.0527	0.0062	0.87
17	0.469	0.1128	0.0133	0.227	0.0546	0.0064	0.242	0.0582	0.0068	0.94
18	0.422	0.1015	0.0119	0.209	0.0503	0.0059	0.213	0.0512	0.0060	0.98
19	0.492	0.1183	0.0139	0.219	0.0527	0.0062	0.273	0.0657	0.0077	0.80
20	0.426	0.1025	0.0121	0.230	0.0553	0.0065	0.196	0.0471	0.0055	1.17
21	0.525	0.1263	0.0149	0.279	0.0671	0.0079	0.246	0.0592	0.0070	1.13
22	0.495	0.1190	0.0140	0.268	0.0645	0.0076	0.227	0.0546	0.0064	1.18
23	0.591	0.1421	0.0167	0.282	0.0678	0.0080	0.309	0.0743	0.0087	0.91
24	0.599	0.1441	0.0169	0.352	0.0847	0.0100	0.247	0.0594	0.0070	1.43
25	0.609	0.1465	0.0172	0.342	0.0823	0.0097	0.267	0.0642	0.0076	1.28
26	0.582	0.1400	0.0165	0.326	0.0784	0.0092	0.256	0.0616	0.0072	1.27
27	0.514	0.1236	0.0145	0.274	0.0659	0.0078	0.240	0.0577	0.0068	1.14
28	0.339	0.0815	0.0096	0.192	0.0462	0.0054	0.147	0.0354	0.0042	1.31
29	0.290	0.0697	0.0082	0.172	0.0414	0.0049	0.118	0.0284	0.0033	1.46
30	0.148	0.0356	0.0042	0.085	0.0204	0.0024	0.063	0.0152	0.0018	1.35
31	0.144	0.0346	0.0041	0.084	0.0202	0.0024	0.060	0.0144	0.0017	1.40

nd = no data
A = % of S2
B = mg/g Rock
C = (mg/g Rock)/TOC

TABLE 6-4

ALKANE AND ALKENE COMPONENT ANALYSIS FROM PYROLYSIS-GC

Well name: YOLLA 1

Date: 1986

Sample: 2075-2084a

Carbon No.	-----Alkane + Alkene-----			-----Alkane-----			-----Alkene-----			Alkane/Alkene
	A	B	C	A	B	C	A	B	C	
1	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
2	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
3	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
4	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
5	1.601	0.3607	0.0390	0.622	0.1401	0.0151	0.979	0.2206	0.0238	0.64
6	1.719	0.3873	0.0419	0.415	0.0935	0.0101	1.304	0.2938	0.0318	0.32
7	0.971	0.2188	0.0237	0.329	0.0741	0.0080	0.642	0.1446	0.0156	0.51
8	0.568	0.1280	0.0138	0.216	0.0487	0.0053	0.352	0.0793	0.0086	0.61
9	0.530	0.1194	0.0129	0.189	0.0426	0.0046	0.341	0.0768	0.0083	0.55
10	0.878	0.1978	0.0214	0.440	0.0991	0.0107	0.438	0.0987	0.0107	1.00
11	0.303	0.0683	0.0074	0.303	0.0683	0.0074	nd	nd	nd	nd
12	0.490	0.1104	0.0119	0.210	0.0473	0.0051	0.280	0.0631	0.0068	0.75
13	0.418	0.0942	0.0102	0.215	0.0484	0.0052	0.203	0.0457	0.0049	1.06
14	0.466	0.1050	0.0114	0.244	0.0550	0.0059	0.222	0.0500	0.0054	1.10
15	0.290	0.0653	0.0071	0.114	0.0257	0.0028	0.176	0.0397	0.0043	0.65
16	0.331	0.0746	0.0081	0.157	0.0354	0.0038	0.174	0.0392	0.0042	0.90
17	0.364	0.0820	0.0089	0.139	0.0313	0.0034	0.225	0.0507	0.0055	0.62
18	0.219	0.0493	0.0053	0.091	0.0205	0.0022	0.128	0.0288	0.0031	0.71
19	0.428	0.0964	0.0104	0.202	0.0455	0.0049	0.226	0.0509	0.0055	0.89
20	0.202	0.0455	0.0049	0.095	0.0214	0.0023	0.107	0.0241	0.0026	0.89
21	0.217	0.0489	0.0053	0.111	0.0250	0.0027	0.106	0.0239	0.0026	1.05
22	0.211	0.0475	0.0051	0.085	0.0192	0.0021	0.126	0.0284	0.0031	0.67
23	0.171	0.0385	0.0042	0.087	0.0196	0.0021	0.084	0.0189	0.0020	1.04
24	0.171	0.0385	0.0042	0.098	0.0221	0.0024	0.073	0.0164	0.0018	1.34
25	0.139	0.0313	0.0034	0.086	0.0194	0.0021	0.053	0.0119	0.0013	1.62
26	0.115	0.0259	0.0028	0.077	0.0173	0.0019	0.038	0.0086	0.0009	2.03
27	0.115	0.0259	0.0028	0.070	0.0158	0.0017	0.045	0.0101	0.0011	1.56
28	0.092	0.0207	0.0022	0.063	0.0142	0.0015	0.029	0.0065	0.0007	2.17
29	0.078	0.0176	0.0019	0.059	0.0133	0.0014	0.019	0.0043	0.0005	3.11
30	0.041	0.0092	0.0010	0.030	0.0068	0.0007	0.011	0.0025	0.0003	2.73
31	0.048	0.0108	0.0012	0.040	0.0090	0.0010	0.008	0.0018	0.0002	5.00

nd = no data
 A = Σ of S2
 B = $\mu\text{g/g Rock}$
 C = $(\mu\text{g/g Rock})/\text{TOC}$

TABLE 6-5

ALKANE AND ALKENE COMPONENT ANALYSIS FROM PYROLYSIS-GC

Well name: YOLLA 1

Date: 1986

Sample: 2174-2183a

Carbon No.	----Alkane + Alkene----			-----Alkane-----			-----Alkene-----			Alkane/Alkene
	A	B	C	A	B	C	A	B	C	
1	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
2	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
3	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
4	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
5	2.131	3.2161	0.0699	0.794	1.1983	0.0261	1.337	2.0178	0.0439	0.59
6	2.168	3.2719	0.0711	0.627	0.9463	0.0206	1.541	2.3257	0.0506	0.41
7	1.370	2.0676	0.0449	0.518	0.7818	0.0170	0.852	1.2858	0.0280	0.61
8	0.967	1.4594	0.0317	0.378	0.5705	0.0124	0.589	0.8889	0.0193	0.64
9	0.850	1.2828	0.0279	0.319	0.4814	0.0105	0.531	0.8014	0.0174	0.60
10	0.891	1.3447	0.0292	0.377	0.5690	0.0124	0.514	0.7757	0.0169	0.73
11	0.811	1.2240	0.0266	0.282	0.4256	0.0093	0.529	0.7984	0.0174	0.53
12	0.651	0.9825	0.0214	0.247	0.3728	0.0081	0.404	0.6097	0.0133	0.61
13	0.454	0.6852	0.0149	0.211	0.3184	0.0069	0.243	0.3667	0.0080	0.87
14	0.417	0.6293	0.0137	0.178	0.2686	0.0058	0.239	0.3607	0.0078	0.74
15	0.248	0.3743	0.0081	0.081	0.1222	0.0027	0.167	0.2520	0.0055	0.49
16	0.158	0.2385	0.0052	0.071	0.1072	0.0023	0.087	0.1313	0.0029	0.82
17	0.192	0.2898	0.0063	0.079	0.1192	0.0026	0.113	0.1705	0.0037	0.70
18	0.159	0.2400	0.0052	0.070	0.1056	0.0023	0.089	0.1343	0.0029	0.79
19	0.113	0.1705	0.0037	0.040	0.0604	0.0013	0.073	0.1102	0.0024	0.55
20	0.154	0.2324	0.0051	0.077	0.1162	0.0025	0.077	0.1162	0.0025	1.00
21	0.175	0.2641	0.0057	0.095	0.1434	0.0031	0.080	0.1207	0.0026	1.19
22	0.217	0.3275	0.0071	0.090	0.1358	0.0030	0.127	0.1917	0.0042	0.71
23	0.203	0.3064	0.0067	0.109	0.1645	0.0036	0.094	0.1419	0.0031	1.16
24	0.202	0.3049	0.0066	0.115	0.1736	0.0038	0.087	0.1313	0.0029	1.32
25	0.208	0.3139	0.0068	0.122	0.1841	0.0040	0.086	0.1298	0.0028	1.42
26	0.174	0.2626	0.0057	0.112	0.1690	0.0037	0.062	0.0936	0.0020	1.81
27	0.162	0.2445	0.0053	0.102	0.1539	0.0033	0.060	0.0906	0.0020	1.70
28	0.134	0.2022	0.0044	0.090	0.1358	0.0030	0.044	0.0664	0.0014	2.05
29	0.130	0.1962	0.0043	0.093	0.1404	0.0031	0.037	0.0558	0.0012	2.51
30	0.065	0.0981	0.0021	0.046	0.0694	0.0015	0.019	0.0287	0.0006	2.42
31	0.078	0.1177	0.0026	0.061	0.0921	0.0020	0.017	0.0257	0.0006	3.59

nd = no data
 A = % of S2
 B = mg/g Rock
 C = (mg/g Rock)/TOC

TABLE 6-6

ALKANE AND ALKENE COMPONENT ANALYSIS FROM PYROLYSIS-GC

Well name: YOLLA 1

Date: 1986

Sample: 2300-2309m

Carbon No.	----Alkane + Alkene----			-----Alkane-----			-----Alkene-----			Alkane/Alkene
	A	B	C	A	B	C	A	B	C	
1	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
2	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
3	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
4	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
5	1.745	0.4101	0.0540	0.366	0.0860	0.0113	1.379	0.3241	0.0426	0.27
6	2.621	0.6159	0.0810	0.738	0.1734	0.0228	1.883	0.4425	0.0582	0.39
7	1.689	0.3969	0.0522	0.655	0.1539	0.0203	1.034	0.2430	0.0320	0.63
8	1.311	0.3081	0.0405	0.517	0.1215	0.0160	0.794	0.1866	0.0246	0.65
9	1.047	0.2460	0.0324	0.400	0.0940	0.0124	0.647	0.1520	0.0200	0.62
10	0.865	0.2033	0.0267	0.292	0.0686	0.0090	0.573	0.1347	0.0177	0.51
11	1.284	0.3017	0.0397	0.317	0.0745	0.0098	0.967	0.2272	0.0299	0.33
12	0.754	0.1772	0.0233	0.310	0.0729	0.0096	0.444	0.1043	0.0137	0.70
13	0.566	0.1330	0.0175	0.262	0.0616	0.0081	0.304	0.0714	0.0094	0.86
14	0.505	0.1187	0.0156	0.242	0.0569	0.0075	0.263	0.0618	0.0081	0.92
15	0.485	0.1140	0.0150	0.193	0.0454	0.0060	0.292	0.0686	0.0090	0.66
16	0.379	0.0891	0.0117	0.180	0.0423	0.0056	0.199	0.0468	0.0062	0.90
17	0.332	0.0780	0.0103	0.128	0.0301	0.0040	0.204	0.0479	0.0063	0.63
18	0.301	0.0707	0.0093	0.136	0.0320	0.0042	0.165	0.0388	0.0051	0.82
19	0.443	0.1041	0.0137	0.209	0.0491	0.0065	0.234	0.0550	0.0072	0.89
20	0.292	0.0686	0.0090	0.144	0.0338	0.0045	0.148	0.0348	0.0046	0.97
21	0.327	0.0768	0.0101	0.163	0.0383	0.0050	0.164	0.0385	0.0051	0.99
22	0.338	0.0794	0.0105	0.158	0.0371	0.0049	0.180	0.0423	0.0056	0.88
23	0.320	0.0752	0.0099	0.168	0.0395	0.0052	0.152	0.0357	0.0047	1.11
24	0.337	0.0792	0.0104	0.188	0.0442	0.0058	0.149	0.0350	0.0046	1.26
25	0.287	0.0674	0.0089	0.167	0.0392	0.0052	0.120	0.0282	0.0037	1.39
26	0.263	0.0618	0.0081	0.167	0.0392	0.0052	0.096	0.0226	0.0030	1.74
27	0.250	0.0588	0.0077	0.150	0.0353	0.0046	0.100	0.0235	0.0031	1.50
28	0.214	0.0503	0.0066	0.139	0.0327	0.0043	0.075	0.0176	0.0023	1.85
29	0.206	0.0484	0.0064	0.146	0.0343	0.0045	0.060	0.0141	0.0019	2.43
30	0.128	0.0301	0.0040	0.087	0.0204	0.0027	0.041	0.0096	0.0013	2.12
31	0.118	0.0277	0.0036	0.089	0.0209	0.0028	0.029	0.0068	0.0009	3.07

nd = no data

A = % of S2

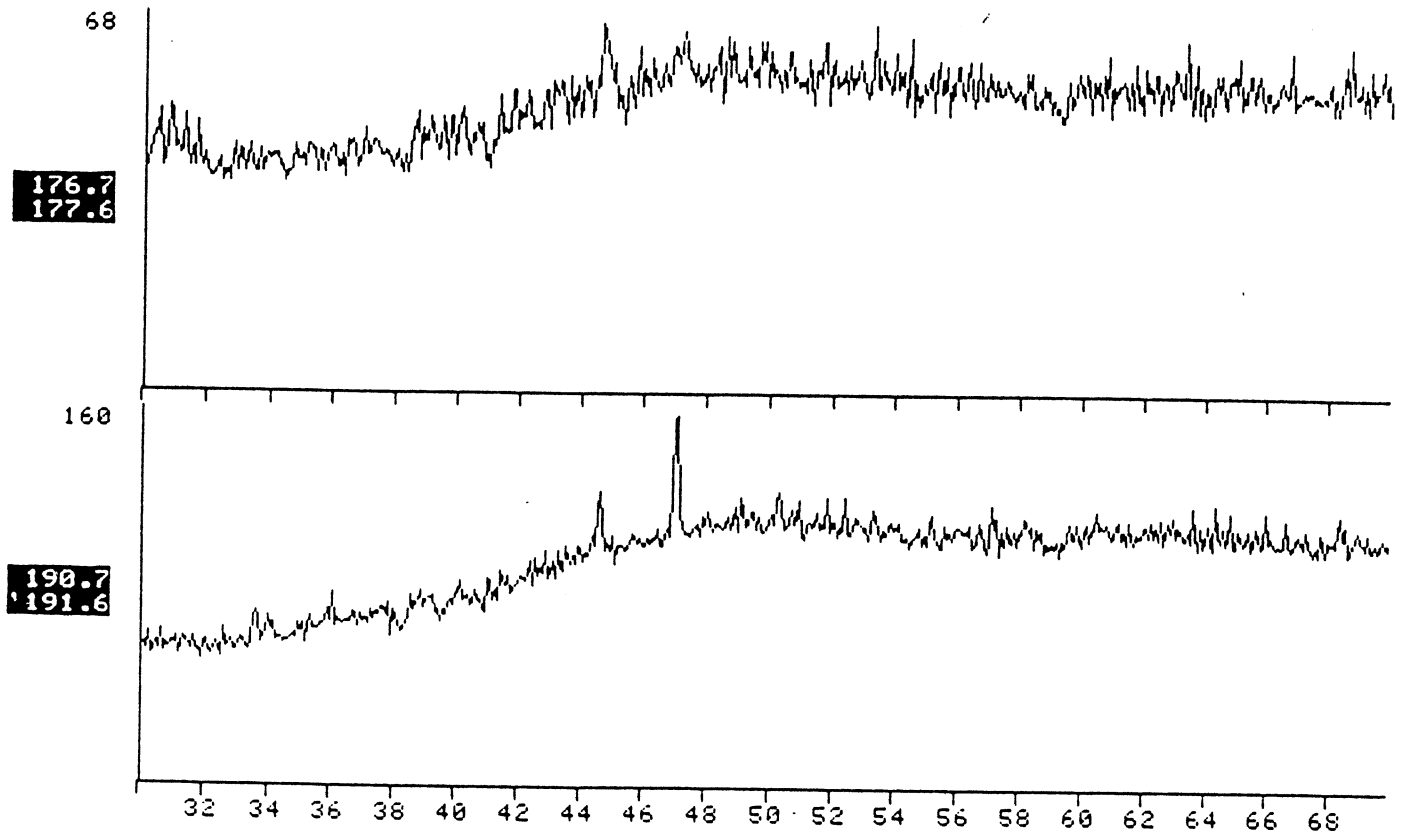
B = mg/g Rock

C = (mg/g Rock)/TOC

FIGURE 13-6

NAME YOLLA#1, DST#1, 2809-2824.5m. BRANCHED CYCLIC FRAGMENTOGRAM.
MISC 29-10-85. GEC/GW. 0.2ul/100ul. COL#56.

FRN 5838



NAME YOLLA#1, DST#1, 2809-2824.5m. BRANCHED CYCLIC FRAGMENTOGRAM.
MISC 29-10-85. GEC/GW. 0.2ul/100ul. COL#56.

FRN 5838

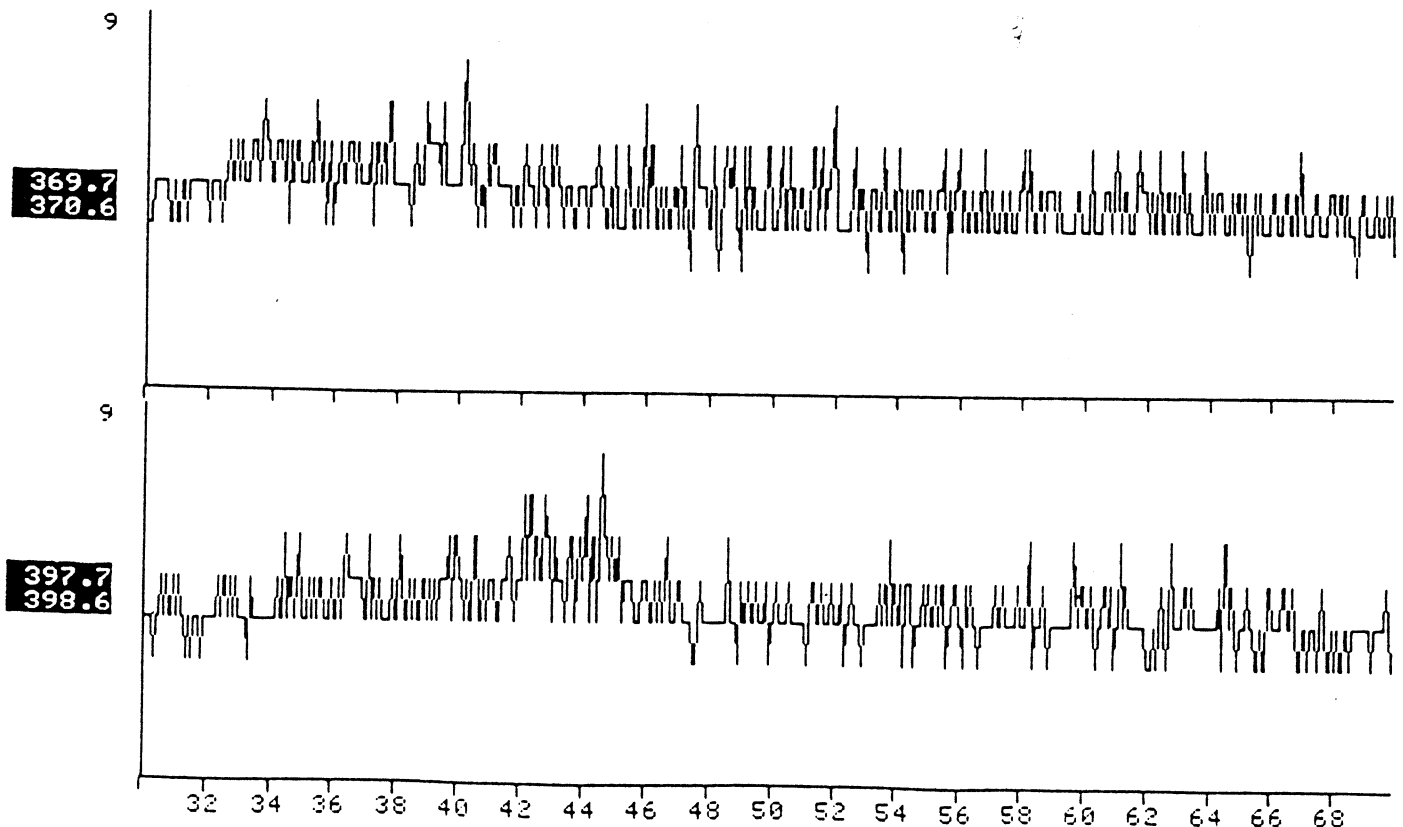
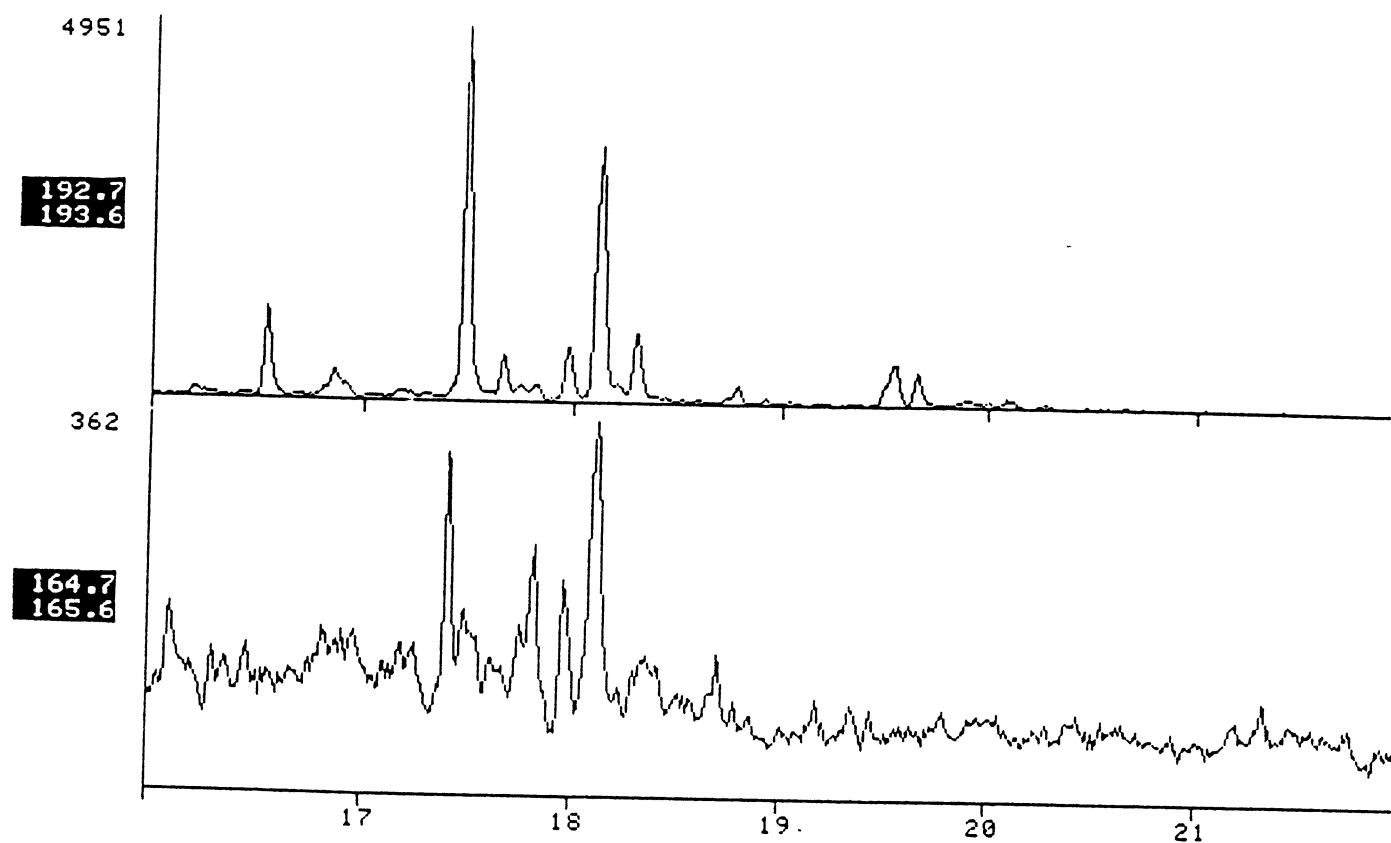


FIGURE 13-7

NAME YOLLA#1, DST#1, 2809-2824.5m. BRANCHED CYCLIC FRAGMENTOGRAM.
 MISC 29-10-85. GEC/GW. 0.2ul/100ul. COL#56.

FRN 5838



NAME YOLLA#1, DST#1, 2809-2824.5m. BRANCHED CYCLIC FRAGMENTOGRAM.
 MISC 29-10-85. GEC/GW. 0.2ul/100ul. COL#56.

FRN 5838

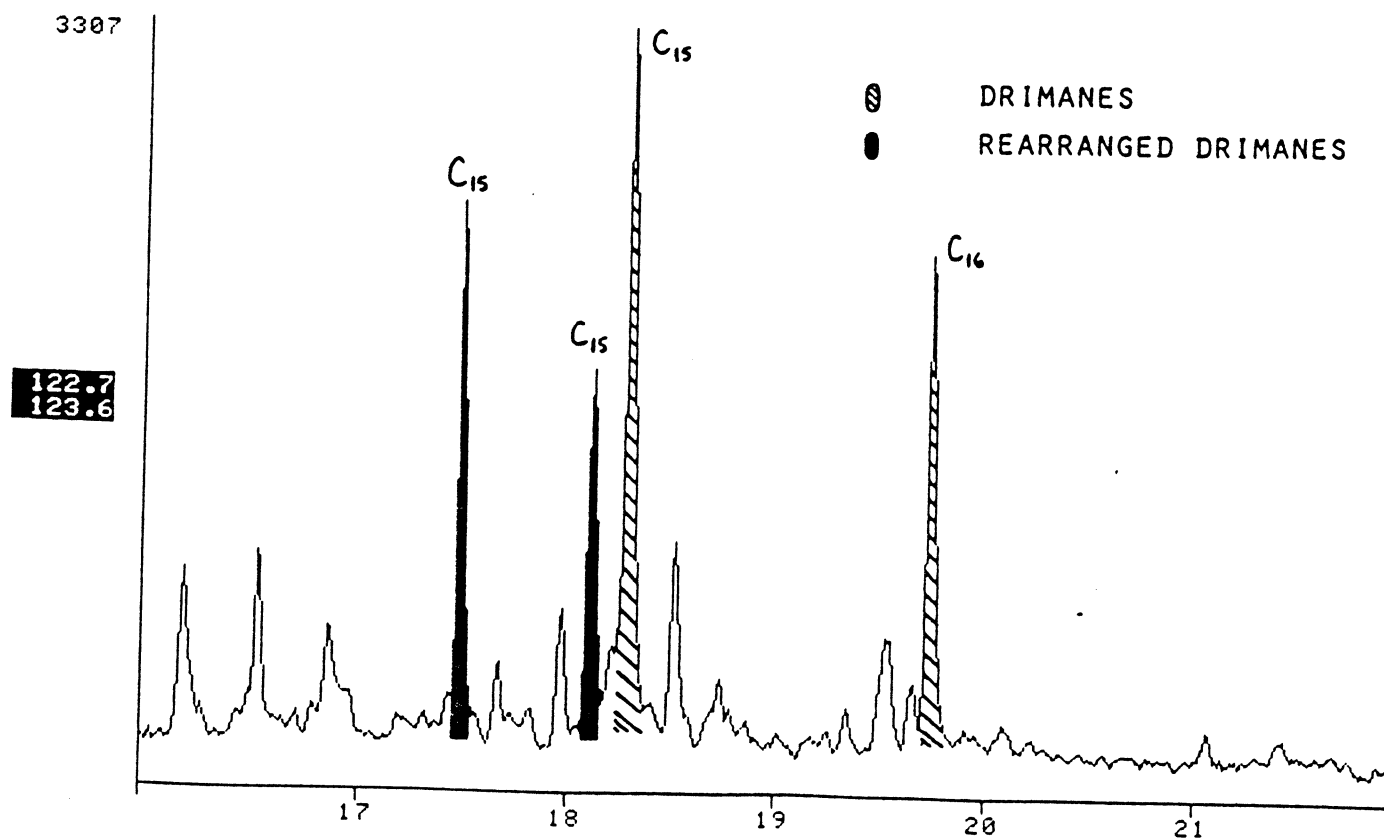
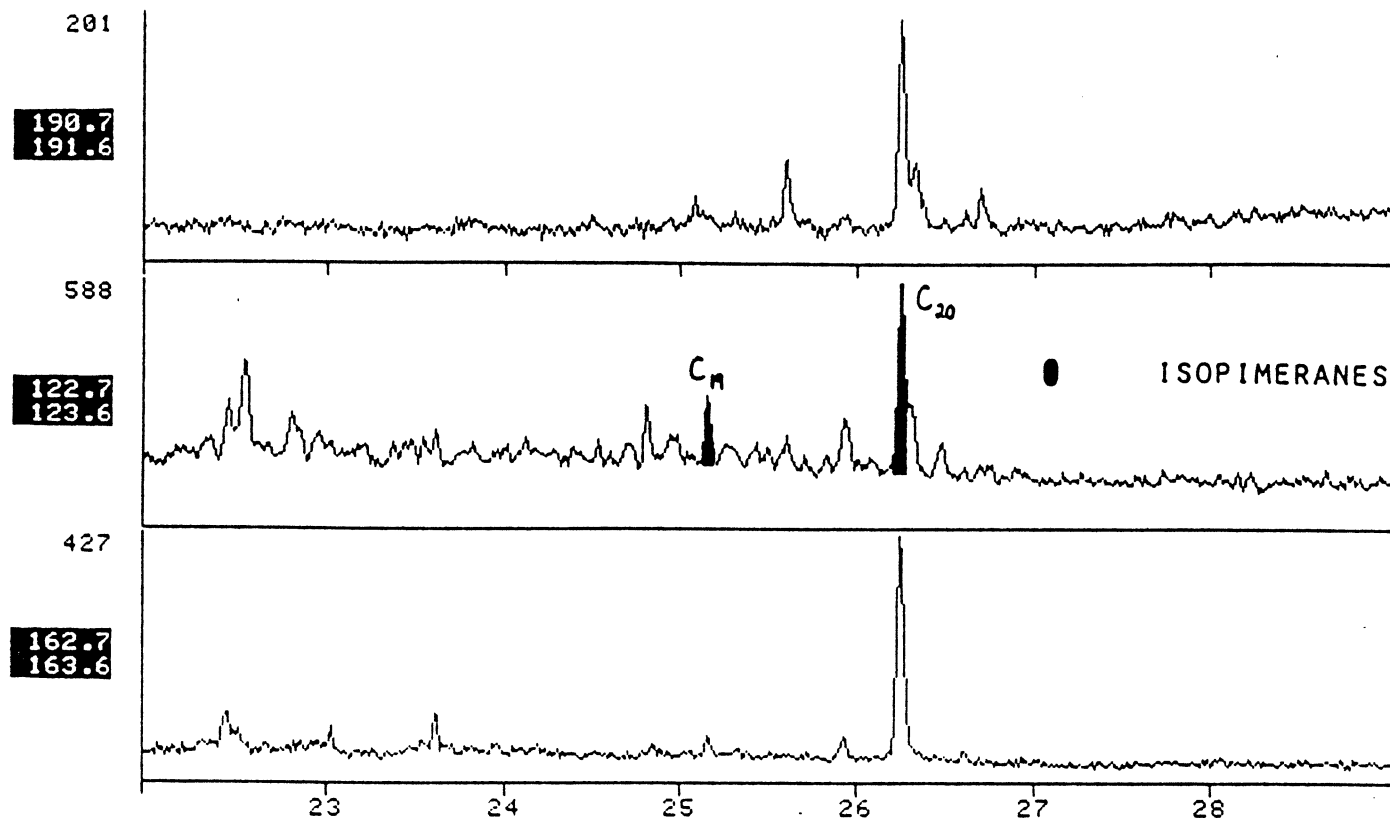


FIGURE 13-8

NAME YOLLA#1, DST#1, 2809-2824.5m. BRANCHED CYCLIC FRAGMENTOGRAM.
 MISC 29-10-85. GEC/GW. 0.2ul/100ul. COL#56.

FRN 5838



NAME YOLLA#1, DST#1, 2809-2824.5m. BRANCHED CYCLIC FRAGMENTOGRAM.
 MISC 29-10-85. GEC/GW. 0.2ul/100ul. COL#56.

FRN 5838

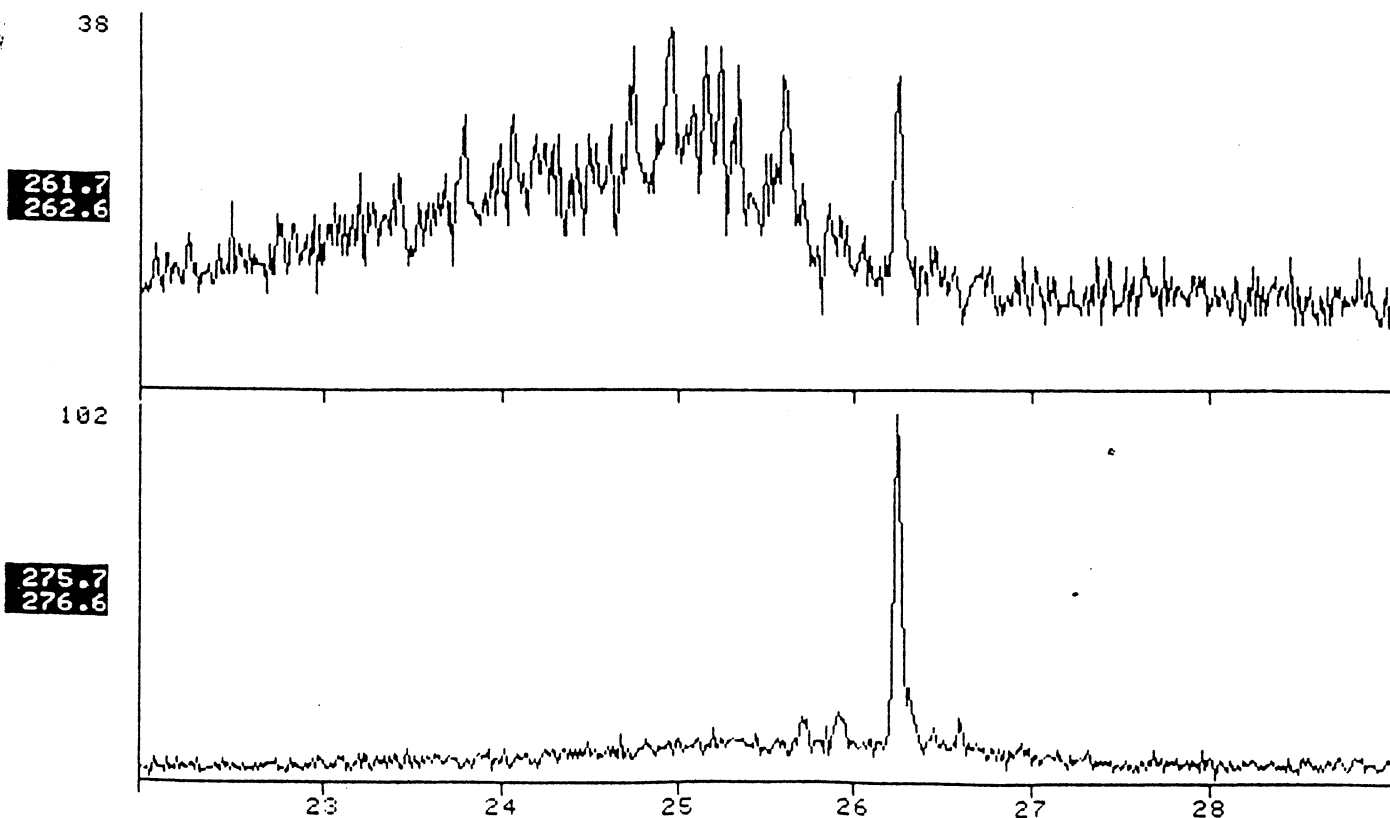
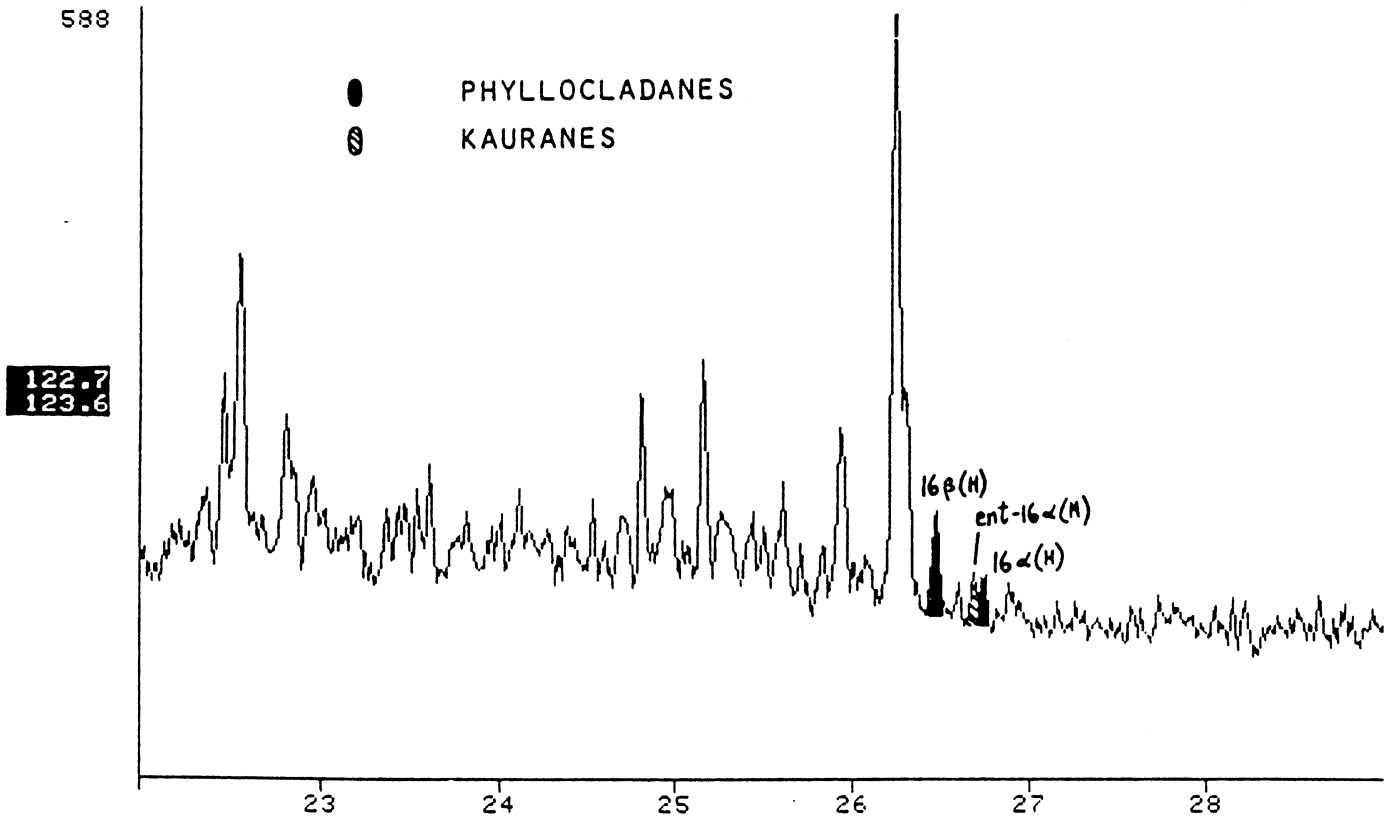


FIGURE 13-9

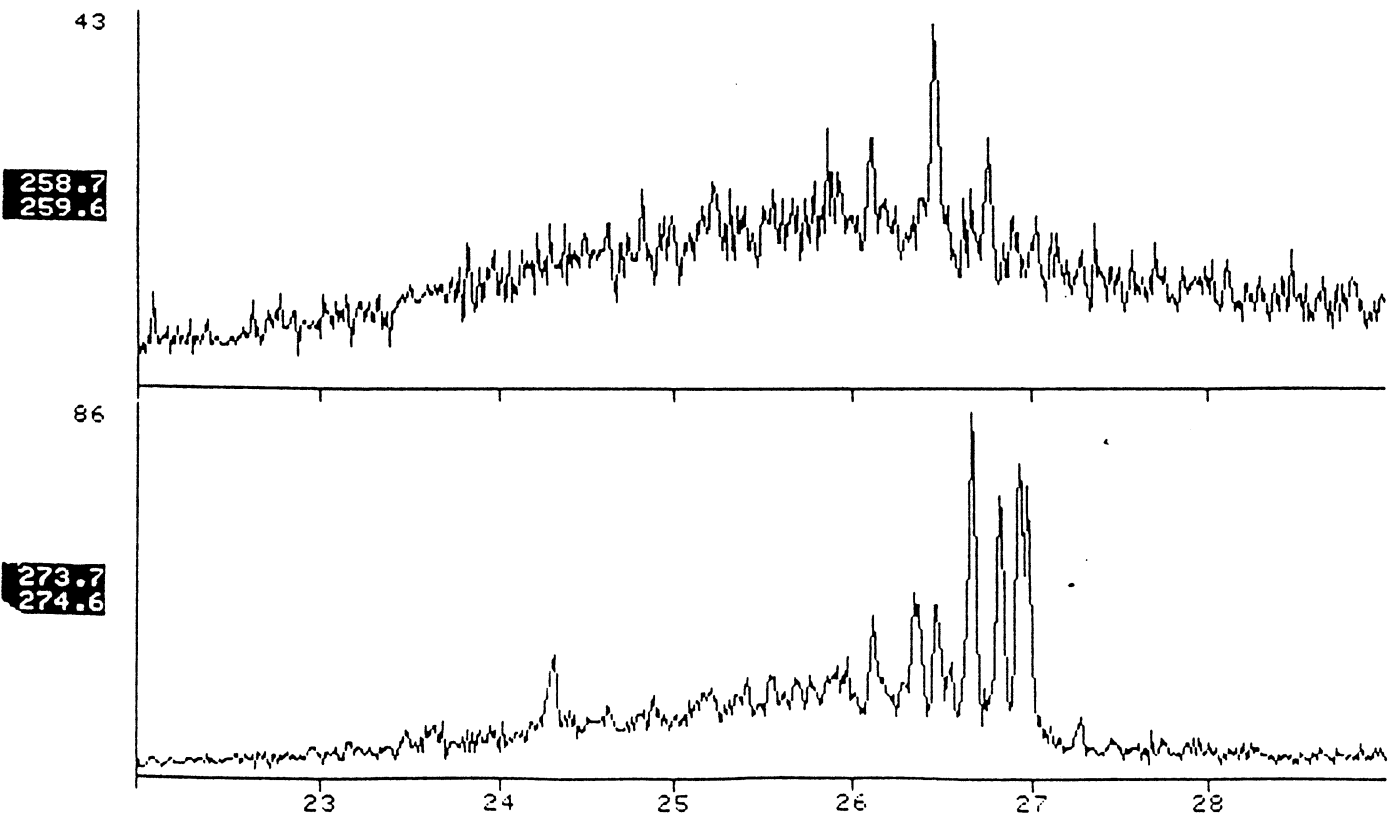
NAME YOLLA*1, DST#1, 2809-2824.5m. BRANCHED CYCLIC FRAGMENTOGRAM.
 MISC 29-10-85. GEC/GW. 0.2ul/100ul. COL#56.

FRN 5838



NAME YOLLA*1, DST#1, 2809-2824.5m. BRANCHED CYCLIC FRAGMENTOGRAM.
 MISC 29-10-85. GEC/GW. 0.2ul/100ul. COL#56.

FRN 5838



PART II - VITRINITE REFLECTANCE DETERMINATIONS AND ORGANIC PETROLOGY

ANALYTICAL PROCEDURE

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 on vitrinite phytoclasts were made to Australian Standard AS 2486-1981 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 $23 \pm 1^\circ\text{C}$. Fluorescence observations were made on the same microscope utilising a 3 mm BG3 excitation filter, a TK400 dichroic mirror and a K510 suppression filter.

RESULTS

A summary of the vitrinite reflectance data is presented in Table 1. Histogram plots of these data are included in Appendix A. Tables 2-4 present the results of the organic petrology.

Table 1: Summary of Vitrinite Reflectance Measurements, Yolla-1

Depth (m)	Mean Maximum Reflectance (%)	Standard Deviation	Range	Number of Determinations
1760-69	0.50	0.04	0.42 - 0.59	33
1958-67	0.52	0.03	0.47 - 0.58	37
2165-74	0.60	0.06	0.47 - 0.71	34
2372-81	0.63	0.06	0.51 - 0.72	39
2573-82	0.92 (1.6)	0.04	0.79 - 0.99	37
2731	0.97+	0.06	0.82 - 1.06	31
2774-83	0.86	0.11	0.59 - 1.02	23
2885	0.81+	0.08	0.69 - 0.97	11
2945	0.70+	0.04	0.65 - 0.76	5
2962-71	0.78*	0.12	0.57 - 1.03	14
3028	0.56+	0.04	0.46 - 0.63	34
3034-43	0.98*	0.06	0.85 - 1.10	31

* Influenced by caved cuttings

+ Sidewall cores

() Reflectance of one coal fragment

Table 2: Percentage of Vitrinite, Inertinite and Exinite
in Dispersed Organic Matter, Yolla-1

Depth (m)	Percentage of		
	Vitrinite	Inertinite	Exinite
1760-69 Silty Shale	75	15	10
1958-67 Coal	75	5	20
Sandstone & Siltstone	70	15	15
2165-74 Coal	70	5	25
Shale	75	20	5
2372-81 Shale	60	15	25
Coal	80	5	15
2573-82 Coal	75	5	20
2731 Shale	10	80	10
2774-83 Siltstone	5	90	<5
Shale	-	100	-
2885 Shale	5	85	10
2945 Siltstone	<<5	90	5
2962-71 Siltstone	<5	90	5
Coal	85	<5	10
3028 Silty Shale	70	5	25
3034-43 Coal	70	<5	25
Shale & Siltstone	<5	85	10
Carb Shale	80	<5	15
Carbonate & Sandstone	-	100	-

Table 3: Organic Matter Type and Abundance, Yolla-1

Depth (m)	Relative Maceral Group Proportions	Estimated Volume of		Exinite Macerals
		DOM (%)	Exinites	
1760-69	V>I>E	1-3	Ra	bmite,spo,?oil,cut,res
1958-67	V>E>I	20-30	Ab	res,spo,cut,lipto,exs, ?phyto,oil
2165-74	V>E>I	>40	Ab	res,sub,spo,cut,exs,lipto
2372-81	V>E>I	~5	Co-Ab	res, spo, cut, lipto, sub
2573-82	V>E>I	>40	Ab	res, sub, spo, cut, exs
2731	I>V>E	~1	Ra	lipto,spo,oil,cut,lama
2774-83	I>V>E	<0.5	Vr	lipto,spo,cut,res
2885	I>E>V	~1	Ra	lipto,spo,cut,lama
2945	I>>E>V	~1	Ra	?oil,lam,cut,spo
2962-71	V>I>E	~1	Vr	spo,phyto,lipto,cut
3028	V>E>I	~3	Ab	bmite,spo,res,cut,?oil
3034-43	V>E>I	5-15	Co	spo,res,cut,bmite,exs,sub

**Table 4: Exinite Maceral Abundance and
Fluorescence Characteristics, Yolla-1**

Depth (m)	Exinite Macerals	Lithology/Comments
1760-69	bmite(Ra;d0),spo(Ra;m0),?oil(Ra-Vr; iY-m0),cut(Vr;m0),res(Tr;m0).	Silty shale; ?oil occurs as coatings on quartz grains.
1958-67	res(Ab;iY-dB),spo(Co;mY-m0), cut(Ra;m0),lipto(Ra;m0-d0), exs(Vr;m0-d0),?phyto(Tr;mY), ?oil(Tr;iG).	~40% coal, ~40% siltstone, ~20% sandstone; coals contain up to 25% resinite 30% exinite) and contain exsudatinite (primary oil i.e. formed in situ). ?oil occurs in the siltstone as coatings on quartz grains. Fluorescence colours of resinite indicate that the generation of oil has commenced from this maceral.
2165-74	res(Ab;iY-d0),sub(Ab;d0), spo(Co;mY-m0),cut(Sp;m0), exs(Ra;iY-m0),lipto(Ra;m0).	Chiefly coal, 5-10% siltstone; coal as above.
2372-81	res(Co-Ab;m0-dB),spo(Co;m0-d0), cut(sp;m0-d0),lipto(Sp;m0).	Chiefly shale, 5-10% well cemented sandstone, ~5% coal.
2573-82	res(Ab;m0-dB),sub(Ab;d0), spo(Ab;m0-dB),cut(Co;m0-dB), exs(Ra;m0-d0).	Coal (carbonaceous shale and carbonate cavings constitute <5% of sample).
2731	lipto(Ra-Vr;d0),spo(Vr;d0), ?oil(Vr;iG-iY),cut(Vr;d0), lama(Vr;d0).	Shale; oil is interstitial to the larger mineral grains.
2774-83	lipto(Vr;d0),spo(Tr;d0),cut(Tr;d0).	Chiefly igneous/volcanics ~20% siltstone, ~5% shale.
2885	lipto(Ra;d0),spo(Vr;d0),cut(Vr;d0), lama(Vr;d0).	Shale.
2945	oil(Ra;iG-iY),lama(Ra-Vr;d0), cut(Vr;d0),spo(Vr;d0-dB).	Siltstone; oil as above.
2962-71	spo(Vr;d0),?phyto(Vr;d0), lipto(Vr;d0),cut(Vr-Tr;d0).	Chiefly siltstone (with patchy distribution of carbonate rich and sandy lithologies) ~5% igneous/ volcanics, ~1% coal. Coal and igneous volcanics are probably cavings.

Table 4: Exinite Maceral Abundance and
Fluorescence Characteristics, Yolla-1
(cont'd)

Depth (m)	Exinite Macerals	Lithology/Comments
3028	bmite(Ab;d0),spo(Vr;m0), res(Vr;m0-d0),cut(Tr;d0), ?oil(Tr;iG,iY).	Silty shale ~5% sandstone. Oil occurs interstitial to quartz grains in the sand- stone and as small accumu- lations in the shale.
3034-43	spo(Co;d0),res(Co;d0),cut(Ra;d0-dB), bmite(Ra;d0-dB),exs(Vr;dB), sub(Tr;dB).	10-20% igneous, 10-20% coal, shale & siltstone, 10-15% carbonaceous shale, 10-15% carbonate, 5-10% sandstone.

Key to Dispersed Organic Matter Descriptions

Maceral Groups

V Vitrinite
I Inertinite
E Exinite

Exinite Macerals

spo Sporinite
cut Cutinite
res Resinite
sub Suberinite
lipto Liptodetrinite
fluor Fluorinite
exs Exsudatinitite
phyto Phytoplankton
tela Telalginite
lama Lamalginite
bmite Bituminite
bmen Bitumen
thuc Thucholite

Abundance (by vol.)

Ma	Major	>15%
Ab	Abundant	2-15%
Co	Common	1-2%
Sp	Sparse	0.5-1%
Ra	Rare	0.1-0.5%
Vr	Very Rare	≈0.1%
Tr	Trace	<0.1%

Fluorescence Colour and Intensity

G	Green	i	Intense
Y	Yellow	m	Moderate
O	Orange	d	Dull
B	Brown		

APPENDIX A

HISTOGRAM PLOTS OF VITRINITE REFLECTANCE
DATA

YOLLA #1

1760-1769 M

SORTED LIST

.42	.43	.45	.45	.46	.46	.47	.48	.48	.48
.49	.49	.49	.49	.49	.49	.5	.5	.5	.5
.51	.51	.51	.52	.52	.53	.53	.54	.55	.55
.56	.57	.59							

Number of values= 33

MEAN OF VALUES .5

STD DEVIATION .038

HISTOGRAM OF RESULTS

Values are reflectance multiplied by 100

42 - 44	|	██
45 - 47	|	██████
48 - 50	|	████████████████████
51 - 53	|	██████████
54 - 56	|	██████
57 - 59	|	██

YOLLA #1

1958-1967 M

SORTED LIST

.47	.47	.47	.47	.48	.48	.48	.49	.49	.49
.5	.5	.5	.5	.5	.51	.51	.52	.52	.52
.53	.53	.53	.53	.54	.55	.55	.55	.56	.56
.56	.56	.56	.57	.57	.57	.58			

Number of values= 37

MEAN OF VALUES .521

STD DEVIATION .034

HISTOGRAM OF RESULTS

Values are reflectance multiplied by 100

47 - 49	|	██████████
50 - 52	|	██████████
53 - 55	|	██████████
56 - 58	|	██████████

YOLLA #1

2165-2174 M

SORTED LIST

.47 .47 .49 .54 .54 .54 .56 .56 .58 .58
.59 .59 .59 .59 .6 .6 .6 .61 .61 .61
.62 .62 .63 .63 .65 .65 .65 .66 .66 .67
.68 .68 .7 .71

Number of values= 34

MEAN OF VALUES .604

STD DEVIATION .059

HISTOGRAM OF RESULTS

Values are reflectance multiplied by 100

47 - 49	|	██
50 - 52	|	
53 - 55	|	██
56 - 58	|	██
59 - 61	|	██████████
62 - 64	|	██
65 - 67	|	██
68 - 70	|	██
71 - 73	|	█

YOLLA #1

2372-2381 M

SORTED LIST

.51 .51 .51 .53 .53 .55 .55 .56 .57 .59
.59 .6 .6 .6 .6 .62 .63 .63 .64 .64
.64 .65 .65 .65 .65 .66 .66 .67 .67 .67
.67 .68 .69 .69 .7 .71 .71 .71 .72

Number of values= 39

MEAN OF VALUES .626

STD DEVIATION .06

HISTOGRAM OF RESULTS

Values are reflectance multiplied by 100

51 - 53	|	|||||
54 - 56	|	||||
57 - 59	|	||||
60 - 62	|	|||||
63 - 65	|	|||||||
66 - 68	|	|||||||
69 - 71	|	|||||||
72 - 74	|	||

YOLLA #1

2573-2582 M

SORTED LIST

.79	.84	.86	.86	.86	.89	.89	.89	.9	.9
.9	.9	.9	.9	.91	.91	.91	.91	.92	.92
.93	.93	.93	.94	.94	.94	.94	.94	.94	.95
.95	.96	.96	.97	.98	.99	.99			

Number of values= 37

MEAN OF VALUES .917

STD DEVIATION .041

HISTOGRAM OF RESULTS

Values are reflectance multiplied by 100

79 - 81	|	■
82 - 84	|	■
85 - 87	|	■■■
88 - 90	|	■■■■■■■■■■
91 - 93	|	■■■■■■■■■■■■■■■■■■■■
94 - 96	|	■■■■■■■■■■■■■■■■■■■■■■■■■■■■■■
97 - 99	|	■■■■■

YOLLA #1

2774-2783 M

SORTED LIST

.59 .66 .72 .75 .79 .8 .81 .82 .82 .86
.89 .91 .92 .93 .93 .94 .94 .94 .94 .95
.97 .98 1.02

Number of values= 23

MEAN OF VALUES .864

STD DEVIATION .107

HISTOGRAM OF RESULTS

Values are reflectance multiplied by 100

59 - 63	| ■
64 - 68	| ■
69 - 73	| ■
74 - 78	| ■
79 - 83	| ■■■■■
84 - 88	| ■
89 - 93	| ■■■■■
94 - 98	| ■■■■■■
99 - 103	| ■

YOLLA #1

2731 M

SORTED LIST

.82 .83 .85 .89 .9 .92 .94 .94 .96 .97
.97 .98 .98 .98 .98 .98 .98 .98 .99 .99
.99 .99 .99 1 1.02 1.02 1.02 1.03 1.05 1.05
1.06

Number of values= 31

MEAN OF VALUES .969
STD DEVIATION .059

HISTOGRAM OF RESULTS

Values are reflectance multiplied by 100

82 - 86	|	██
87 - 91	|	██
92 - 96	|	██
97 - 101	|	████████████████
102 - 106	|	██████████

YOLLA #1

2962-2971 M

SORTED LIST

.57 .63 .65 .7 .71 .73 .81 .81 .82 .83
.86 .87 .87 1.03

Number of values= 14

MEAN OF VALUES .778
STD DEVIATION .116

HISTOGRAM OF RESULTS

Values are reflectance multiplied by 100

57 - 61	|	■
62 - 66	|	■■■
67 - 71	|	■■■
72 - 76	|	■
77 - 81	|	■■■
82 - 86	|	■■■■
87 - 91	|	■■■
92 - 96	|	
97 - 101	|	
102 - 106	|	■

YOLLA #1

3034-3043 M

SORTED LIST

.85 .86 .9 .9 .93 .93 .93 .95 .95 .95
.95 .96 .96 .98 1 1 1.01 1.01 1.01 1.02
1.02 1.02 1.02 1.03 1.03 1.04 1.04 1.05 1.05 1.05
1.1

Number of values= 31

MEAN OF VALUES .984
STD DEVIATION .059

HISTOGRAM OF RESULTS

Values are reflectance multiplied by 100

85 - 89	|	██
90 - 94	|	██████
95 - 99	|	██████████
100 - 104	|	██████████████
105 - 109	|	██████
110 - 114	|	██

YOLLA #1

2885 M

SORTED LIST

.69 .72 .75 .78 .78 .8 .82 .84 .85 .9
.97

Number of values= 11

MEAN OF VALUES .809
STD DEVIATION .076

HISTOGRAM OF RESULTS

Values are reflectance multiplied by 100

69 - 73	| ■■■
74 - 78	| ■■■■
79 - 83	| ■■■
84 - 88	| ■■■
89 - 93	| ■■
94 - 98	| ■■

YOLLA #1

2945.0 M

SORTED LIST

.65 .69 .7 .71 .76

Number of values= 5

MEAN OF VALUES .702

STD DEVIATION .035

HISTOGRAM OF RESULTS

Values are reflectance multiplied by 100

65 - 69	| ■■■
70 - 74	| ■■■
75 - 79	| ■

YOLLA #1

3028 M

SORTED LIST

.46 .49 .5 .5 .51 .51 .52 .53 .53 .53
.54 .54 .55 .56 .56 .57 .57 .57 .57 .58
.58 .59 .59 .59 .59 .59 .6 .6 .6 .6
.61 .61 .62 .63

Number of values= 34

MEAN OF VALUES .561

STD DEVIATION .041

HISTOGRAM OF RESULTS

Values are reflectance multiplied by 100

46 - 50	|	██████
51 - 55	|	██████████
56 - 60	|	██████████████████
61 - 65	|	██████

TABLE 6-7

ALKANE AND ALKENE COMPONENT ANALYSIS FROM PYROLYSIS-GC

Well name: YOLLA 1

Date: 1986

Sample: 2462-2471m

Carbon No.	-----Alkane + Alkene-----			-----Alkane-----			-----Alkene-----			Alkane/Alkene
	A	B	C	A	B	C	A	B	C	
1	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
2	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
3	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
4	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
5	4.974	2.7049	0.1197	2.980	1.6205	0.0717	1.994	1.0843	0.0480	1.49
6	3.410	1.8544	0.0821	1.270	0.6906	0.0306	2.140	1.1637	0.0515	0.59
7	2.453	1.3339	0.0590	1.198	0.6515	0.0288	1.255	0.6825	0.0302	0.95
8	1.991	1.0824	0.0479	0.791	0.4299	0.0190	1.200	0.6526	0.0289	0.66
9	1.514	0.8233	0.0364	0.717	0.3899	0.0173	0.797	0.4334	0.0192	0.90
10	1.456	0.7918	0.0350	0.636	0.3459	0.0153	0.820	0.4459	0.0197	0.78
11	1.290	0.7015	0.0310	0.693	0.3769	0.0167	0.597	0.3246	0.0144	1.16
12	1.204	0.6547	0.0290	0.632	0.3437	0.0152	0.572	0.3111	0.0138	1.10
13	1.026	0.5579	0.0247	0.578	0.3143	0.0139	0.448	0.2436	0.0108	1.29
14	0.934	0.5079	0.0225	0.551	0.2996	0.0133	0.383	0.2083	0.0092	1.44
15	1.019	0.5541	0.0245	0.494	0.2686	0.0119	0.525	0.2855	0.0126	0.94
16	0.751	0.4084	0.0181	0.458	0.2491	0.0110	0.293	0.1593	0.0071	1.56
17	1.026	0.5579	0.0247	0.598	0.3252	0.0144	0.428	0.2327	0.0103	1.40
18	0.740	0.4024	0.0178	0.450	0.2447	0.0108	0.290	0.1577	0.0070	1.55
19	0.619	0.3366	0.0149	0.337	0.1833	0.0081	0.282	0.1534	0.0068	1.20
20	0.641	0.3486	0.0154	0.336	0.1827	0.0081	0.305	0.1659	0.0073	1.10
21	0.745	0.4051	0.0179	0.399	0.2170	0.0096	0.346	0.1882	0.0083	1.15
22	0.633	0.3442	0.0152	0.346	0.1882	0.0083	0.287	0.1561	0.0069	1.21
23	0.556	0.3024	0.0134	0.292	0.1588	0.0070	0.264	0.1436	0.0064	1.11
24	0.534	0.2904	0.0128	0.327	0.1778	0.0079	0.207	0.1126	0.0050	1.58
25	0.565	0.3072	0.0136	0.358	0.1947	0.0086	0.207	0.1126	0.0050	1.73
26	0.407	0.2213	0.0098	0.260	0.1414	0.0063	0.147	0.0799	0.0035	1.77
27	0.362	0.1969	0.0087	0.244	0.1327	0.0059	0.118	0.0642	0.0028	2.07
28	0.272	0.1479	0.0065	0.182	0.0990	0.0044	0.090	0.0489	0.0022	2.02
29	0.208	0.1131	0.0050	0.155	0.0843	0.0037	0.053	0.0288	0.0013	2.92
30	0.072	0.0392	0.0017	0.072	0.0392	0.0017	nd	nd	nd	nd
31	0.118	0.0642	0.0028	0.118	0.0642	0.0028	nd	nd	nd	nd

nd = no data

A = % of S2

B = mg/g Rock

C = (mg/g Rock)/TOC

TABLE 6-8

ALKANE AND ALKENE COMPONENT ANALYSIS FROM PYROLYSIS-6C

Well name: YOLLA 1

Date: 1986

Sample: 2517-2526m

Carbon No.	---Alkane + Alkene---			-----Alkane-----			-----Alkene-----			Alkane/Alkene
	A	B	C	A	B	C	A	B	C	
1	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
2	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
3	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
4	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
5	1.899	0.1519	0.0086	1.185	0.0948	0.0053	0.714	0.0571	0.0032	1.66
6	1.065	0.0852	0.0048	0.520	0.0416	0.0023	0.545	0.0436	0.0025	0.95
7	0.806	0.0645	0.0036	0.460	0.0368	0.0021	0.346	0.0277	0.0016	1.33
8	0.611	0.0489	0.0028	0.374	0.0299	0.0017	0.237	0.0190	0.0011	1.58
9	0.455	0.0364	0.0021	0.255	0.0204	0.0011	0.200	0.0160	0.0009	1.28
10	0.386	0.0309	0.0017	0.223	0.0178	0.0010	0.163	0.0130	0.0007	1.37
11	0.337	0.0270	0.0015	0.198	0.0158	0.0009	0.139	0.0111	0.0006	1.42
12	0.313	0.0250	0.0014	0.172	0.0138	0.0008	0.141	0.0113	0.0006	1.22
13	0.266	0.0213	0.0012	0.161	0.0129	0.0007	0.105	0.0084	0.0005	1.53
14	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
15	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
16	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
17	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
18	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
19	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
20	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
21	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
22	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
23	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
24	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
25	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
26	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
27	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
28	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
29	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
30	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
31	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd

nd = no data

A = % of S2

B = mg/g Rock

C = (mg/g Rock)/TOC

TABLE 6-9

ALKANE AND ALKENE COMPONENT ANALYSIS FROM PYROLYSIS-GC

Well name: YOLLA 1

Date: 1986

Sample: 2573-2582m

Carbon No.	----Alkane + Alkene----			-----Alkane-----			-----Alkene-----			Alkane/Alkene
	A	B	C	A	B	C	A	B	C	
1	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
2	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
3	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
4	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
5	1.795	1.9921	0.0424	0.856	0.9500	0.0202	0.939	1.0421	0.0222	0.91
6	1.591	1.7657	0.0376	0.520	0.5771	0.0123	1.071	1.1886	0.0253	0.49
7	1.097	1.2175	0.0259	0.463	0.5138	0.0109	0.634	0.7036	0.0150	0.73
8	0.924	1.0255	0.0218	0.453	0.5027	0.0107	0.471	0.5227	0.0111	0.96
9	0.764	0.8479	0.0180	0.338	0.3751	0.0080	0.426	0.4728	0.0101	0.79
10	0.721	0.8002	0.0170	0.311	0.3451	0.0073	0.410	0.4550	0.0097	0.76
11	0.778	0.8634	0.0184	0.398	0.4417	0.0094	0.380	0.4217	0.0090	1.05
12	0.759	0.8423	0.0179	0.376	0.4173	0.0089	0.383	0.4251	0.0090	0.98
13	0.524	0.5815	0.0124	0.267	0.2963	0.0063	0.257	0.2852	0.0061	1.04
14	0.464	0.5149	0.0110	0.268	0.2974	0.0063	0.196	0.2175	0.0046	1.37
15	0.383	0.4251	0.0090	0.209	0.2319	0.0049	0.174	0.1931	0.0041	1.20
16	0.329	0.3651	0.0078	0.200	0.2220	0.0047	0.129	0.1432	0.0030	1.55
17	0.252	0.2797	0.0060	0.132	0.1465	0.0031	0.120	0.1332	0.0028	1.10
18	0.319	0.3540	0.0075	0.185	0.2053	0.0044	0.134	0.1487	0.0032	1.38
19	0.334	0.3707	0.0079	0.186	0.2064	0.0044	0.148	0.1643	0.0035	1.26
20	0.450	0.4994	0.0106	0.234	0.2597	0.0055	0.216	0.2397	0.0051	1.08
21	0.455	0.5050	0.0107	0.283	0.3141	0.0067	0.172	0.1909	0.0041	1.65
22	0.487	0.5405	0.0115	0.262	0.2908	0.0062	0.225	0.2497	0.0053	1.16
23	0.434	0.4817	0.0102	0.260	0.2885	0.0061	0.174	0.1931	0.0041	1.49
24	0.375	0.4162	0.0089	0.244	0.2708	0.0058	0.131	0.1454	0.0031	1.86
25	0.385	0.4273	0.0091	0.253	0.2808	0.0060	0.132	0.1465	0.0031	1.92
26	0.328	0.3640	0.0077	0.220	0.2442	0.0052	0.108	0.1199	0.0026	2.04
27	0.306	0.3396	0.0072	0.208	0.2308	0.0049	0.098	0.1088	0.0023	2.12
28	0.254	0.2819	0.0060	0.159	0.1765	0.0038	0.095	0.1054	0.0022	1.67
29	0.218	0.2419	0.0051	0.147	0.1631	0.0035	0.071	0.0788	0.0017	2.07
30	0.153	0.1698	0.0036	0.077	0.0855	0.0018	0.076	0.0843	0.0018	1.01
31	0.122	0.1354	0.0029	0.091	0.1010	0.0021	0.031	0.0344	0.0007	2.94

nd = no data
 A = % of S2
 B = mg/g Rock
 C = (mg/g Rock)/TOC

TABLE 6-10

ALKANE AND ALKENE COMPONENT ANALYSIS FROM PYROLYSIS-6C

Well name: YOLLA 1

Date: 1986

Sample: J007-3016a

Carbon No.	----Alkane + Alkene----			-----Alkane-----			-----Alkene-----			Alkane/Alkene
	A	B	C	A	B	C	A	B	C	
1	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
2	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
3	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
4	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
5	1.905	0.2385	0.0367	0.877	0.1098	0.0169	1.028	0.1287	0.0198	0.85
6	1.822	0.2281	0.0351	0.713	0.0893	0.0137	1.109	0.1388	0.0214	0.64
7	1.380	0.1728	0.0266	0.660	0.0826	0.0127	0.720	0.0901	0.0139	0.92
8	1.079	0.1351	0.0208	0.558	0.0699	0.0107	0.521	0.0652	0.0100	1.07
9	0.917	0.1148	0.0177	0.441	0.0552	0.0085	0.476	0.0596	0.0092	0.93
10	0.867	0.1085	0.0167	0.408	0.0511	0.0079	0.459	0.0575	0.0088	0.89
11	0.821	0.1028	0.0158	0.384	0.0481	0.0074	0.437	0.0547	0.0084	0.88
12	0.720	0.0901	0.0139	0.333	0.0417	0.0064	0.387	0.0485	0.0075	0.86
13	0.724	0.0906	0.0139	0.384	0.0481	0.0074	0.340	0.0426	0.0065	1.13
14	0.857	0.1073	0.0165	0.557	0.0697	0.0107	0.300	0.0376	0.0058	1.86
15	0.651	0.0815	0.0125	0.339	0.0424	0.0065	0.312	0.0391	0.0060	1.09
16	0.650	0.0814	0.0125	0.355	0.0444	0.0068	0.295	0.0369	0.0057	1.20
17	0.572	0.0716	0.0110	0.315	0.0394	0.0061	0.257	0.0322	0.0050	1.23
18	0.461	0.0577	0.0089	0.283	0.0354	0.0055	0.178	0.0223	0.0034	1.59
19	0.423	0.0530	0.0081	0.248	0.0310	0.0048	0.175	0.0219	0.0034	1.42
20	0.386	0.0483	0.0074	0.242	0.0303	0.0047	0.144	0.0180	0.0028	1.68
21	0.426	0.0533	0.0082	0.270	0.0338	0.0052	0.156	0.0195	0.0030	1.73
22	0.342	0.0428	0.0066	0.209	0.0262	0.0040	0.133	0.0167	0.0026	1.57
23	0.331	0.0414	0.0064	0.189	0.0237	0.0036	0.142	0.0178	0.0027	1.33
24	0.225	0.0282	0.0043	0.138	0.0173	0.0027	0.087	0.0109	0.0017	1.59
25	0.218	0.0273	0.0042	0.158	0.0198	0.0030	0.060	0.0075	0.0012	2.63
26	0.148	0.0185	0.0029	0.100	0.0125	0.0019	0.048	0.0060	0.0009	2.08
27	0.106	0.0133	0.0020	0.073	0.0091	0.0014	0.033	0.0041	0.0006	2.21
28	0.084	0.0105	0.0016	0.060	0.0075	0.0012	0.024	0.0030	0.0005	2.50
29	0.045	0.0056	0.0009	0.031	0.0039	0.0006	0.014	0.0018	0.0003	2.21
30	0.031	0.0039	0.0006	0.024	0.0030	0.0005	0.007	0.0009	0.0001	3.43
31	0.011	0.0014	0.0002	0.011	0.0014	0.0002	nd	nd	nd	nd

nd = no data

A = % of S2

B = mg/g Rock

C = (mg/g Rock)/TOC

TABLE 7-1

PARAMETER SUMMARY FOR PYROLYSIS GAS CHROMATOGRAPHY

Well name: YOLLA 1

Sample: 1785m SWC

Date: 1986

Parameter	-----Value-----			
	A	B	C	D
C1-C4 abundance (all compounds)	40.91	2.692	0.518	
C5-C8 abundance (all compounds)	22.58	1.486	0.286	
C5-C8 abundance (alkanes+alkenes)	6.48	0.427	0.082	
C9-C14 abundance (all compounds)	23.26	1.531	0.294	
C9-C14 abundance (alkanes+alkenes)	5.74	0.377	0.073	
C15-C31 abundance (all compounds)	13.24	0.871	0.168	
C15-C31 abundance (alkanes+alkenes)	6.84	0.450	0.087	
C5-C31 abundance (all compounds)	59.09	3.888	0.748	
C5-C31 abundance (alkanes+alkenes)	19.06	1.254	0.241	
C5-C31 alkane abundance	8.37	0.551	0.106	
C5-C31 alkene abundance	10.69	0.703	0.135	
C5-C8 alkane/alkene				0.506
C9-C14 alkane/alkene				0.852
C15-C31 alkane/alkene				1.081
C5-C31 alkane/alkene				0.783
C1-C4 abundance/S2				0.409
C5-C31 abundance/S2				0.591
(C1-C5)/C5+ abundance				0.879
R				
PI x PC x TOC	47.22	3.107	0.598	
				0.293

nd = no data
 A = % of S2
 B = mg/g Rock
 C = (mg/g Rock)/TOC
 D = (no units)
 R = [(C1-C4)+(Proportion alkenes x (C5-C31))]
 N.B. C1-C4 and C5-C31 are for all compounds
 PI = Production index
 PC = Pyrolysable carbon
 S2 = Rock-Eval S2 value
 TOC = Total Organic Carbon

TABLE 7-2

PARAMETER SUMMARY FOR PYROLYSIS GAS CHROMATOGRAPHY

Well name: YOLLA 1

Sample: 1958-1967m

Date: 1986

Parameter	-----Value-----			
	A	B	C	D
C1-C4 abundance (all compounds)	50.79	10.432	1.288	
C5-C8 abundance (all compounds)	18.81	3.863	0.477	
C5-C8 abundance (alkanes+alkenes)	6.14	1.261	0.156	
C9-C14 abundance (all compounds)	22.65	4.653	0.574	
C9-C14 abundance (alkanes+alkenes)	4.16	0.854	0.105	
C15-C31 abundance (all compounds)	7.75	1.592	0.197	
C15-C31 abundance (alkanes+alkenes)	3.52	0.722	0.089	
C5-C31 abundance (all compounds)	49.21	10.108	1.248	
C5-C31 abundance (alkanes+alkenes)	13.81	2.838	0.350	
C5-C31 alkane abundance	5.69	1.168	0.144	
C5-C31 alkene abundance	8.13	1.670	0.206	
C5-C8 alkane/alkene				0.519
C9-C14 alkane/alkene				0.630
C15-C31 alkane/alkene				1.288
C5-C31 alkane/alkene				0.699
C1-C4 abundance/S2				0.508
C5-C31 abundance/S2				0.492
(C1-C5)/C5+ abundance				1.269
R				
PI x PC x TOC	54.79	11.254	1.389	
				1.217

nd = no data
 A = % of S2
 B = mg/g Rock
 C = (mg/g Rock)/TOC
 D = (no units)
 R = [(C1-C4)+(Proportion alkenes x (C5-C31))]
 N.B. C1-C4 and C5-C31 are for all compounds
 PI = Production index
 PC = Pyrolysable carbon
 S2 = Rock-Eval S2 value
 TOC = Total Organic Carbon

TABLE 7-3

PARAMETER SUMMARY FOR PYROLYSIS GAS CHROMATOGRAPHY

Well name: YOLLA 1

Sample: 2021-2030m

Date: 1986

Parameter	-----Value-----			
	A	B	C	D
C1-C4 abundance (all compounds)	47.27	11.368	1.337	
C5-C8 abundance (all compounds)	16.32	3.926	0.462	
C5-C8 abundance (alkanes+alkenes)	6.93	1.667	0.196	
C9-C14 abundance (all compounds)	22.30	5.364	0.631	
C9-C14 abundance (alkanes+alkenes)	4.69	1.129	0.133	
C15-C31 abundance (all compounds)	14.10	3.392	0.399	
C15-C31 abundance (alkanes+alkenes)	7.78	1.871	0.220	
C5-C31 abundance (all compounds)	52.73	12.682	1.492	
C5-C31 abundance (alkanes+alkenes)	19.40	4.667	0.549	
C5-C31 alkane abundance	8.43	2.027	0.238	
C5-C31 alkene abundance	10.98	2.640	0.311	
C5-C8 alkane/alkene				0.558
C9-C14 alkane/alkene				0.719
C15-C31 alkane/alkene				1.050
C5-C31 alkane/alkene				0.768
C1-C4 abundance/S2				0.473
C5-C31 abundance/S2				0.527
(C1-C5)/C5+ abundance				1.094
R				
PI x PC x TOC	53.05	12.760	1.501	
				1.016

nd = no data
 A = % of S2
 B = mg/g Rock
 C = (mg/g Rock)/TOC
 D = (no units)
 R = [(C1-C4)+(Proportion alkenes x (C5-C31))]
 N.B. C1-C4 and C5-C31 are for all compounds
 PI = Production index
 PC = Pyrolysable carbon
 S2 = Rock-Eval S2 value
 TOC = Total Organic Carbon

TABLE 7-4

PARAMETER SUMMARY FOR PYROLYSIS GAS CHROMATOGRAPHY

Well name: YOLLA 1

Sample: 2075-2084m

Date: 1986

Parameter	-----Value-----			
	A	B	C	D
C1-C4 abundance (all compounds)	50.78	11.441	1.237	
C5-C8 abundance (all compounds)	18.00	4.056	0.438	
C5-C8 abundance (alkanes+alkenes)	4.86	1.095	0.118	
C9-C14 abundance (all compounds)	22.79	5.134	0.555	
C9-C14 abundance (alkanes+alkenes)	3.09	0.695	0.075	
C15-C31 abundance (all compounds)	8.43	1.900	0.205	
C15-C31 abundance (alkanes+alkenes)	3.23	0.728	0.079	
C5-C31 abundance (all compounds)	49.22	11.090	1.199	
C5-C31 abundance (alkanes+alkenes)	11.18	2.518	0.272	
C5-C31 alkane abundance	4.79	1.079	0.117	
C5-C31 alkene abundance	6.39	1.439	0.156	
C5-C8 alkane/alkene				0.483
C9-C14 alkane/alkene				1.079
C15-C31 alkane/alkene				0.985
C5-C31 alkane/alkene				0.749
C1-C4 abundance/S2				0.508
C5-C31 abundance/S2				0.492
(C1-C5)/C5+ abundance				1.339
R	53.92	12.149	1.313	
PI x PC x TOC				0.837

nd = no data
 A = % of S2
 B = mg/g Rock
 C = (mg/g Rock)/TOC
 D = (no units)
 R = [(C1-C4)+(Proportion alkenes x (C5-C31))]
 N.B. C1-C4 and C5-C31 are for all compounds
 PI = Production index
 PC = Pyrolysable carbon
 S2 = Rock-Eval S2 value
 TOC = Total Organic Carbon

TABLE 7-5

PARAMETER SUMMARY FOR PYROLYSIS GAS CHROMATOGRAPHY

Well name: YOLLA 1

Sample: 2174-2183m

Date: 1986

Parameter	-----Value-----			
	A	B	C	D
C1-C4 abundance (all compounds)	60.96	91.996	2.000	
C5-C8 abundance (all compounds)	16.47	24.852	0.540	
C5-C8 abundance (alkanes+alkenes)	6.64	10.015	0.218	
C9-C14 abundance (all compounds)	16.43	24.795	0.539	
C9-C14 abundance (alkanes+alkenes)	4.07	6.148	0.134	
C15-C31 abundance (all compounds)	6.15	9.277	0.202	
C15-C31 abundance (alkanes+alkenes)	2.77	4.184	0.091	
C5-C31 abundance (all compounds)	39.04	58.924	1.281	
C5-C31 abundance (alkanes+alkenes)	13.48	20.347	0.442	
C5-C31 alkane abundance	5.38	8.126	0.177	
C5-C31 alkene abundance	8.10	12.222	0.266	
C5-C8 alkane/alkene				0.536
C9-C14 alkane/alkene				0.656
C15-C31 alkane/alkene				1.102
C5-C31 alkane/alkene				0.665
C1-C4 abundance/S2				0.610
C5-C31 abundance/S2				0.390
(C1-C5)/C5+ abundance				1.947
R				
PI x PC x TOC	64.12	96.768	2.104	
				55.81

nd = no data
 A = % of S2
 B = mg/g Rock
 C = (mg/g Rock)/TOC
 D = (no units)
 R = [(C1-C4)+(Proportion alkenes x (C5-C31))]
 N.B. C1-C4 and C5-C31 are for all compounds
 PI = Production index
 PC = Pyrolysable carbon
 S2 = Rock-Eval S2 value
 TOC = Total Organic Carbon

TABLE 7-6

PARAMETER SUMMARY FOR PYROLYSIS GAS CHROMATOGRAPHY

Well name: YOLLA 1

Date: 1986

Sample: 2300-2309m

Parameter	-----Value-----			
	A	B	C	D
C1-C4 abundance (all compounds)	53.17	12.494	1.644	
C5-C8 abundance (all compounds)	20.47	4.811	0.633	
C5-C8 abundance (alkanes+alkenes)	7.37	1.731	0.228	
C9-C14 abundance (all compounds)	16.67	3.918	0.515	
C9-C14 abundance (alkanes+alkenes)	5.02	1.180	0.155	
C15-C31 abundance (all compounds)	9.69	2.277	0.300	
C15-C31 abundance (alkanes+alkenes)	5.02	1.180	0.155	
C5-C31 abundance (all compounds)	46.83	11.006	1.448	
C5-C31 abundance (alkanes+alkenes)	17.41	4.091	0.538	
C5-C31 alkane abundance	6.71	1.577	0.208	
C5-C31 alkene abundance	10.70	2.514	0.331	
C5-C8 alkane/alkene				0.447
C9-C14 alkane/alkene				0.570
C15-C31 alkane/alkene				1.085
C5-C31 alkane/alkene				0.627
C1-C4 abundance/S2				0.532
C5-C31 abundance/S2				0.468
(C1-C5)/C5+ abundance				1.491
R	58.18	13.672	1.799	
PI x PC x TOC				0.858

nd = no data
 A = % of S2
 B = mg/g Rock
 C = (mg/g Rock)/TOC
 D = (no units)
 R = [(C1-C4)+(Proportion alkenes x (C5-C31))]
 N.B. C1-C4 and C5-C31 are for all compounds
 PI = Production index
 PC = Pyrolysable carbon
 S2 = Rock-Eval S2 value
 TOC = Total Organic Carbon

TABLE 7-7

PARAMETER SUMMARY FOR PYROLYSIS GAS CHROMATOGRAPHY

Well name: YOLLA 1

Date: 1986

Sample: 2462-2471m

Parameter	-----Value-----			
	A	B	C	D
C1-C4 abundance (all compounds)	58.49	31.805	1.407	
C5-C8 abundance (all compounds)	14.23	7.738	0.342	
C5-C8 abundance (alkanes+alkenes)	12.83	6.976	0.309	
C9-C14 abundance (all compounds)	16.99	9.240	0.409	
C9-C14 abundance (alkanes+alkenes)	7.42	4.037	0.179	
C15-C31 abundance (all compounds)	10.29	5.597	0.248	
C15-C31 abundance (alkanes+alkenes)	9.27	5.040	0.223	
C5-C31 abundance (all compounds)	41.51	22.575	0.999	
C5-C31 abundance (alkanes+alkenes)	29.52	16.053	0.710	
C5-C31 alkane abundance	15.47	8.413	0.372	
C5-C31 alkene abundance	14.05	7.639	0.338	
C5-C8 alkane/alkene				0.947
C9-C14 alkane/alkene				1.053
C15-C31 alkane/alkene				1.412
C5-C31 alkane/alkene				1.101
C1-C4 abundance/S2				0.585
C5-C31 abundance/S2				0.415
(C1-C5)/C5+ abundance				1.702
R	64.32	34.977	1.548	
PI x PC x TOC				11.27

nd = no data
 A = % of S2
 B = mg/g Rock
 C = (mg/g Rock)/TOC
 D = (no units)
 R = [(C1-C4)+(Proportion alkenes x (C5-C31))]
 N.B. C1-C4 and C5-C31 are for all compounds
 PI = Production index
 PC = Pyrolysable carbon
 S2 = Rock-Eval S2 value
 TOC = Total Organic Carbon

TABLE 7-8

PARAMETER SUMMARY FOR PYROLYSIS GAS CHROMATOGRAPHY

Well name: YOLLA 1

Date: 1986

Sample: 2517-2526m

Parameter	-----Value-----			
	A	B	C	D
C1-C4 abundance (all compounds)	62.18	4.975	0.280	
C5-C8 abundance (all compounds)	12.00	0.960	0.054	
C5-C8 abundance (alkanes+alkenes)	4.38	0.350	0.020	
C9-C14 abundance (all compounds)	10.98	0.879	0.049	
C9-C14 abundance (alkanes+alkenes)	1.76	0.141	0.008	
C15-C31 abundance (all compounds)	14.84	1.187	0.067	
C15-C31 abundance (alkanes+alkenes)	nd	nd	nd	
C5-C31 abundance (all compounds)	37.82	3.025	0.170	
C5-C31 abundance (alkanes+alkenes)	6.14	0.491	0.028	
C5-C31 alkane abundance	3.55	0.284	0.016	
C5-C31 alkene abundance	2.59	0.207	0.012	
C5-C8 alkane/alkene				1.378
C9-C14 alkane/alkene				1.349
C15-C31 alkane/alkene				nd
C5-C31 alkane/alkene				1.370
C1-C4 abundance/S2				0.622
C5-C31 abundance/S2				0.378
(C1-C5)/C5+ abundance				1.842
R	63.16	5.053	0.285	
PI x PC x TOC				4.096

nd = no data
 A = % of S2
 B = mg/g Rock
 C = (mg/g Rock)/TOC
 D = (no units)
 R = [(C1-C4)+(Proportion alkenes x (C5-C31))]
 N.B. C1-C4 and C5-C31 are for all compounds
 PI = Production index
 PC = Pyrolysable carbon
 S2 = Rock-Eval S2 value
 TOC = Total Organic Carbon

TABLE 7-9

PARAMETER SUMMARY FOR PYROLYSIS GAS CHROMATOGRAPHY

Well name: YOLLA 1

Sample: 2573-2582m

Date: 1986

Parameter	-----Value-----			
	A	B	C	D
C1-C4 abundance (all compounds)	53.13	58.967	1.255	
C5-C8 abundance (all compounds)	15.27	16.949	0.361	
C5-C8 abundance (alkanes+alkenes)	5.41	6.001	0.128	
C9-C14 abundance (all compounds)	19.39	21.521	0.458	
C9-C14 abundance (alkanes+alkenes)	4.01	4.450	0.095	
C15-C31 abundance (all compounds)	12.20	13.544	0.288	
C15-C31 abundance (alkanes+alkenes)	5.58	6.197	0.132	
C5-C31 abundance (all compounds)	46.87	52.014	1.107	
C5-C31 abundance (alkanes+alkenes)	15.00	16.648	0.354	
C5-C31 alkane abundance	7.60	8.434	0.179	
C5-C31 alkene abundance	7.40	8.214	0.175	
C5-C8 alkane/alkene				0.736
C9-C14 alkane/alkene				0.954
C15-C31 alkane/alkene				1.500
C5-C31 alkane/alkene				1.027
C1-C4 abundance/S2				0.531
C5-C31 abundance/S2				0.469
(C1-C5)/C5+ abundance				1.380
R	56.60	62.817	1.337	
PI x PC x TOC				38.23

nd = no data
 A = % of S2
 B = mg/g Rock
 C = (mg/g Rock)/TOC
 D = (no units)
 R = [(C1-C4)+(Proportion alkenes x (C5-C31))]
 N.B. C1-C4 and C5-C31 are for all compounds
 PI = Production index
 PC = Pyrolysable carbon
 S2 = Rock-Eval S2 value
 TOC = Total Organic Carbon

TABLE 7-10

PARAMETER SUMMARY FOR PYROLYSIS GAS CHROMATOGRAPHY

Well name: YOLLA 1

Date: 1986

Sample: 3007-3016m

Parameter	-----Value-----			
	A	B	C	D
C1-C4 abundance (all compounds)	54.74	6.854	1.054	
C5-C8 abundance (all compounds)	18.27	2.287	0.352	
C5-C8 abundance (alkanes+alkenes)	6.19	0.774	0.119	
C9-C14 abundance (all compounds)	15.99	2.002	0.308	
C9-C14 abundance (alkanes+alkenes)	4.91	0.614	0.094	
C15-C31 abundance (all compounds)	11.00	1.377	0.212	
C15-C31 abundance (alkanes+alkenes)	5.11	0.640	0.098	
C5-C31 abundance (all compounds)	45.26	5.666	0.872	
C5-C31 abundance (alkanes+alkenes)	16.20	2.028	0.312	
C5-C31 alkane abundance	8.36	1.047	0.161	
C5-C31 alkene abundance	7.84	0.982	0.151	
C5-C8 alkane/alkene				0.831
C9-C14 alkane/alkene				1.045
C15-C31 alkane/alkene				1.475
C5-C31 alkane/alkene				1.066
C1-C4 abundance/S2				0.547
C5-C31 abundance/S2				0.453
(C1-C5)/C5+ abundance				1.490
R	58.29	7.298	1.123	
PI x PC x TOC				0.917

nd = no data
 A = % of S2
 B = mg/g Rock
 C = (mg/g Rock)/TOC
 D = (no units)
 R = [(C1-C4)+(Proportion alkenes x (C5-C31))]
 N.B. C1-C4 and C5-C31 are for all compounds
 PI = Production index
 PC = Pyrolysable carbon
 S2 = Rock-Eval S2 value
 TOC = Total Organic Carbon

TABLE 8

SELECTED PARAMETERS FROM GC/MS ANALYSIS

Sample: YOLLA 1, 3007-3016m

	<u>Parameter</u>	<u>Ion(s)</u>	<u>Value</u>
1.	18 α (H)-hopane/17 α (H)-hopane (Ts/Tm)	191	0.29
2.	C ₃₀ hopane/C ₃₀ moretane	191	4.11
3.	C ₃₁ 22S hopane/C ₃₁ 22R hopane	191	0.94
4.	C ₃₂ 22S hopane/C ₃₂ 22R hopane	191	0.90
5.	C ₂₉ 20S $\alpha\alpha\alpha$ sterane/C ₂₉ 20R $\alpha\alpha\alpha$ sterane	217	0.70
6.	$\frac{C_{29} \alpha\beta\beta \text{ steranes}}{C_{29} \alpha\alpha\alpha \text{ steranes} + C_{29} \alpha\beta\beta \text{ steranes}}$	217	0.44
7.	C ₂₇ /C ₂₉ diasteranes	259	0.11
8.	C ₂₇ /C ₂₉ steranes	217	nd
9.	18 α (H)-oleanane/C ₃₀ hopane	191	nd
10.	$\frac{C_{29} \text{ diasteranes}}{C_{29} \alpha\alpha\alpha \text{ steranes} + C_{29} \alpha\beta\beta \text{ steranes}}$	217	0.50
11.	$\frac{C_{30} (\text{hopane} + \text{moretane})}{C_{29} (\text{steranes} + \text{diasteranes})}$	191/217	2.28
12.	C ₁₅ drimane/C ₁₆ homodrimane	123	0.41
13.	Rearranged drimanes/normal drimanes	123	0.40
14.	C ₁₅ alkyl cyclohexane/C ₃₀ hopane	83/191	32.70

nd = no data

TABLE 9-1

SUMMARY OF WHOLE OIL ANALYSIS

Date: 1986

Company: AMOCO AUSTRALIA

Sample: YOLLA 1, 1830-1835m DST 2, 5.30pm

PHYSICAL PROPERTY DATA

API Gravity	%Sulphur(w/w)	Viscosity(25°C)	Viscosity(60°C)	Pour Pt(°C)
nd	nd	nd	nd	nd

COMPOSITION BY CARBON NUMBER

COMPOSITION OF C4-C7 FRACTION

Carbon Number	Rel. Wt %	Compound	Rel. Wt %
1 - 3	0.20	A isobutane	1.21
4	1.06	B n-butane	3.24
5	2.52	C isopentane	4.31
6	6.70	D n-pentane	5.60
7	13.47	E 2,2-dimethylbutane	0.20
8	16.87	F cyclopentane	0.68
9	10.92	G 2,3-dimethylbutane	0.76
10	7.31	H 2-methylpentane	4.20
11	5.96	I 3-methylpentane	2.39
12	6.17	J n-hexane	8.12
13	4.54	K methylcyclopentane	4.78
14	5.33	L 2,4-dimethylpentane	0.49
15	3.60	M benzene	1.33
16	2.74	N cyclohexane	6.46
17	3.49	O 1,1-dimethylcyclopentane	0.87
18	1.60	P 2-methylhexane	2.90
19	1.39	Q 3-methylhexane	4.23
20	1.23	R 1 cis-3-dimethylcyclopentane	1.38
21	0.98	S 1 trans-3-dimethylcyclopentane	2.19
22	0.93	T 1 trans-2-dimethylcyclopentane	0.18
23	0.71	U n-heptane	10.78
24	0.61	V methylcyclohexane	23.03
25	0.49	W 1 cis-2-dimethylcyclopentane	0.60
26	0.39	X toluene	10.07
27	0.30		
28	0.18		
29	0.14		
30	0.11		
31	0.05		

CALCULATED DATA - C4-C7 FRACTION

CALCULATED DATA - C12+ FRACTION

Pristane/Phytane	8.14
Pristane/n-C17	1.06
Phytane/n-C18	0.15
TMTD/Pristane	0.52
(C21+C22)/(C28+C29)	5.69

Paraffin Index I	1.90
Paraffin Index II	20.73
N/K (Maturity)	1.35
C/D (Maturity)	0.77
J/K (Maturity)	1.70
I/M (Water washing)	1.80
I/J (Biodegradation)	0.29

nd = no data

TMTD = Trimethyltridecane

is = Insufficient sample

Paraffin Index I = (P+Q)/(R+S+T)

Paraffin Index II = %U in all compounds N-V

bdl = Below detection limit

TABLE 9-2

SUMMARY OF WHOLE OIL ANALYSIS

Date: 1986

Company: AMOCO AUSTRALIA

Sample: YOLLA 1, 2809-2824.5m DST 1

PHYSICAL PROPERTY DATA

API Gravity	%Sulphur (w/w)	Viscosity (25°C)	Viscosity (60°C)	Pour Pt (°C)
nd	nd	nd	nd	nd

COMPOSITION BY CARBON NUMBER

COMPOSITION OF C4-C7 FRACTION

Carbon Number	Rel. Wt %	Compound	Rel. Wt %
1 - 3	0.35	A isobutane	1.22
4	1.53	B n-butane	3.71
5	3.49	C isopentane	4.40
6	8.92	D n-pentane	6.11
7	16.99	E 2,2-dimethylbutane	0.20
8	18.70	F cyclopentane	0.78
9	11.48	G 2,3-dimethylbutane	0.72
10	6.88	H 2-methylpentane	3.86
11	5.95	I 3-methylpentane	2.21
12	5.90	J n-hexane	7.88
13	4.55	K methylcyclopentane	4.64
14	4.59	L 2,4-dimethylpentane	0.43
15	3.34	M benzene	2.80
16	1.96	N cyclohexane	6.54
17	1.81	O 1,1-dimethylcyclopentane	0.66
18	0.82	P 2-methylhexane	2.42
19	0.64	Q 3-methylhexane	3.44
20	0.51	R 1 cis-3-dimethylcyclopentane	1.13
21	0.38	S 1 trans-3-dimethylcyclopentane	1.76
22	0.32	T 1 trans-2-dimethylcyclopentane	0.14
23	0.24	U n-heptane	9.19
24	0.19	V methylcyclohexane	20.22
25	0.15	W 1 cis-2-dimethylcyclopentane	0.45
26	0.11	X toluene	15.08
27	0.09		
28	0.05		
29	0.04		
30	0.02		
31	0.01		

CALCULATED DATA - C4-C7 FRACTION

CALCULATED DATA - C12+ FRACTION

Pristane/Phytane	9.14
Pristane/n-C17	0.71
Phytane/n-C18	0.10
TMTD/Pristane	0.92
(C21+C22)/(C28+C29)	7.69

Paraffin Index I	1.93
Paraffin Index II	20.19
N/K (Maturity)	1.41
C/D (Maturity)	0.72
J/K (Maturity)	1.70
I/M (Water washing)	0.79
I/J (Biodegradation)	0.28

nd = no data
TMTD = Trimethyltridecane
is = Insufficient sample

Paraffin Index I = (P+Q)/(R+S+T)
Paraffin Index II = %U in all compounds N-V
bdl = Below detection limit

TABLE 10

A. Alkane Compositional Data		Summary of Gas Chromatography Data Well: YOLLA 1				Date of Job: JANUARY 1986	
Sample	Prist./Phyt.	Prist./n-C17	Phyt./n-C18	CPI(1)	CPI(2)	(C21+C22)/(C28+C29)	
1830-1835m 5.30pm	7.43	1.14	.16	1.08	1.06	6.34	
1830-1835m 10.00pm	5.87	.90	.16	1.10	1.08	8.41	

TABLE 10

B. n-Alkane Distributions		Summary of Gas Chromatography Data														Date of Job: JANUARY 1986									
		Well: YOLLA 1																							
Sample		nC12	nC13	nC14	nC15	nC16	nC17	iC19	nC18	iC20	nC19	nC20	nC21	nC22	nC23	nC24	nC25	nC26	nC27	nC28	nC29	nC30	nC31		
1830-1835m	5.30pm	7.1	7.0	6.8	6.5	6.1	6.1	6.9	5.9	.9	6.2	6.1	6.2	5.9	5.6	4.9	4.2	3.0	2.5	1.2	.7	.2	.		
1830-1835m	10.00pm	5.7	7.3	8.9	8.7	8.3	8.2	7.4	7.7	1.3	7.4	6.5	5.4	4.2	3.4	2.9	2.3	1.7	1.4	.7	.4	.2	.		

na = not applicable nd = no data

TABLE 11

Summary of Physical Property and Sulphur Data

Date of Job: JANUARY 1986

Well: YOLLA 1

Sample	API Gravity	ZSulphur(w/w)	Viscosity(25°C)	Viscosity(60°C)
1830-1835m 5.30pm	nd	nd	nd	nd
1830-1835m 10.00pm	nd	nd	nd	nd

TABLE 11

Summary of Liquid Chromatography(Compositional Data)

Date of Job: JANUARY 1986

Well: YOLLA 1

Sample	-----Hydrocarbons-----			-----Nonhydrocarbons-----			SAT	ASPH	HC
	ZSAT.	ZAROM.	ZHC's	ZNSO's	ZASPH.	ZNon HC's	AROM	NSO	Non HC
1830-1835m 5.30pm	80.9	17.7	98.6	1.4	nd	1.4	4.57	nd	70.5
1830-1835m 10.00pm	nd	nd	nd	nd	nd	nd	nd	nd	nd

na = not applicable

nd = no data

TABLE 12-1

SELECTED PARAMETERS FROM GC/MS ANALYSIS

Sample: YOLLA 1, DST 2

	<u>Parameter</u>	<u>Ion(s)</u>	<u>Value</u>
1.	18 α (H)-hopane/17 α (H)-hopane (Ts/Tm)	191	0.12
2.	C ₃₀ hopane/C ₃₀ moretane	191	4.91
3.	C ₃₁ 22S hopane/C ₃₁ 22R hopane	191	0.81
4.	C ₃₂ 22S hopane/C ₃₂ 22R hopane	191	1.05
5.	C ₂₉ 20S $\alpha\alpha\alpha$ sterane/C ₂₉ 20R $\alpha\alpha\alpha$ sterane	217	0.77
6.	$\frac{C_{29} \alpha\beta\beta \text{ steranes}}{C_{29} \alpha\alpha\alpha \text{ steranes} + C_{29} \alpha\beta\beta \text{ steranes}}$	217	0.51
7.	C ₂₇ /C ₂₉ diasteranes	259	nd
8.	C ₂₇ /C ₂₉ steranes	217	nd
9.	18 α (H)-oleanane/C ₃₀ hopane	191	nd
10.	$\frac{C_{29} \text{ diasteranes}}{C_{29} \alpha\alpha\alpha \text{ steranes} + C_{29} \alpha\beta\beta \text{ steranes}}$	217	0.65
11.	$\frac{C_{30} (\text{hopane} + \text{moretane})}{C_{29} (\text{steranes} + \text{diasteranes})}$	191/217	4.74
12.	C ₁₅ drimane/C ₁₆ homodrimane	123	1.44
13.	Rearranged drimanes/normal drimanes	123	0.52
14.	C ₁₅ alkyl cyclohexane/C ₃₀ hopane	83/191	25.36

nd = no data

TABLE 12-2

SELECTED PARAMETERS FROM GC/MS ANALYSIS

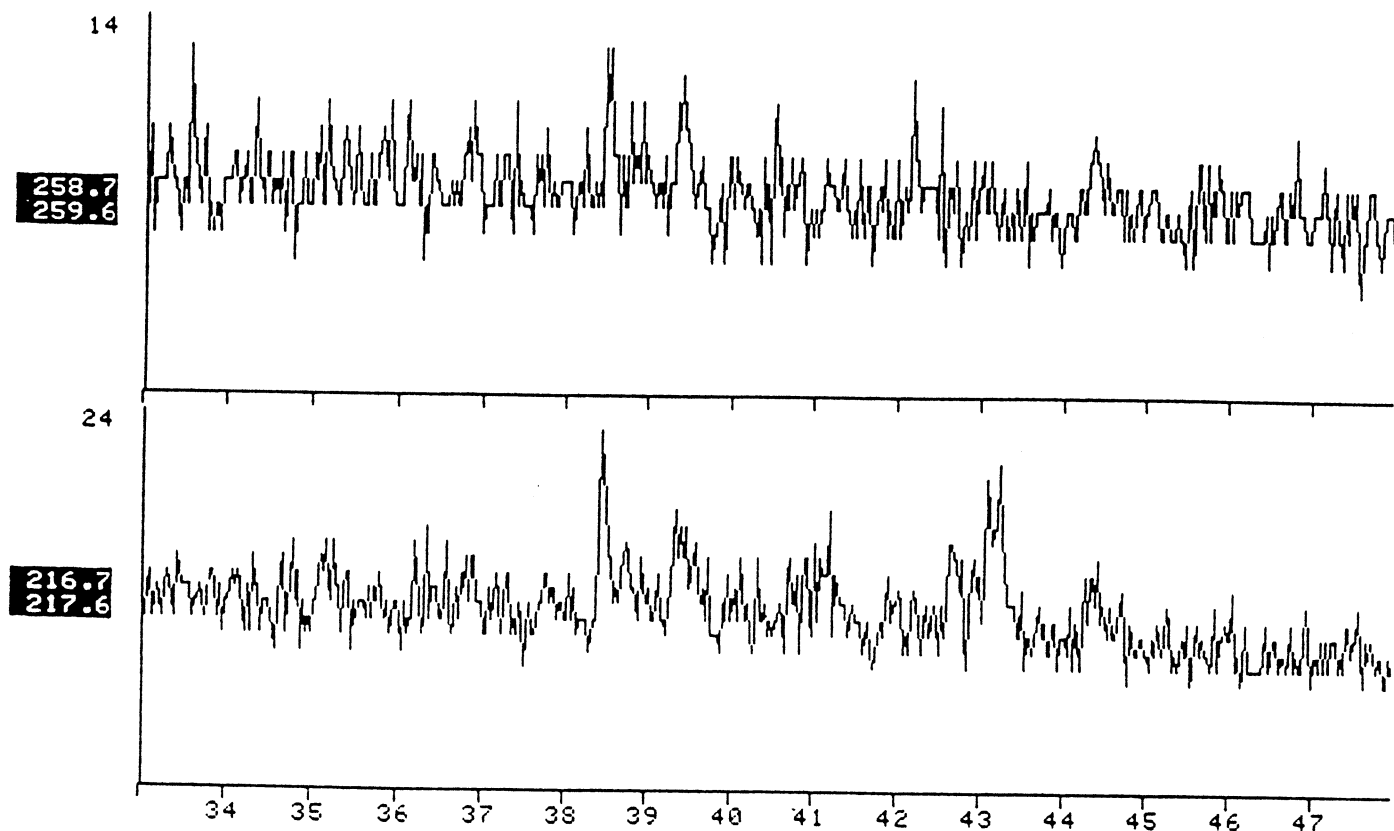
Sample: YOLLA 1, DST 1

	<u>Parameter</u>	<u>Ion(s)</u>	<u>Value</u>
1.	18 α (H)-hopane/17 α (H)-hopane (Ts/Tm)	191	1.15
2.	C ₃₀ hopane/C ₃₀ moretane	191	6.81
3.	C ₃₁ 22S hopane/C ₃₁ 22R hopane	191	1.52
4.	C ₃₂ 22S hopane/C ₃₂ 22R hopane	191	nd
5.	C ₂₉ 20S $\alpha\alpha\alpha$ sterane/C ₂₉ 20R $\alpha\alpha\alpha$ sterane	217	1.02
6.	$\frac{C_{29} \alpha\beta\beta \text{ steranes}}{C_{29} \alpha\alpha\alpha \text{ steranes} + C_{29} \alpha\beta\beta \text{ steranes}}$	217	0.60
7.	C ₂₇ /C ₂₉ diasteranes	259	nd
8.	C ₂₇ /C ₂₉ steranes	217	nd
9.	18 α (H)-oleanane/C ₃₀ hopane	191	nd
10.	$\frac{C_{29} \text{ diasteranes}}{C_{29} \alpha\alpha\alpha \text{ steranes} + C_{29} \alpha\beta\beta \text{ steranes}}$	217	0.73
11.	$\frac{C_{30} (\text{hopane} + \text{moretane})}{C_{29} (\text{steranes} + \text{diasteranes})}$	191/217	1.78
12.	C ₁₅ drimane/C ₁₆ homodrimane	123	1.52
13.	Rearranged drimanes/normal drimanes	123	0.65
14.	C ₁₅ alkyl cyclohexane/C ₃₀ hopane	83/191	75.93

nd = no data

FIGURE 13-2

NAME YOLLA#1, DST#1, 2809-2824.5m. BRANCHED CYCLIC FRAGMENTOGRAM. FRN 5838
 MISC 29-10-85. GEC/GW. 0.2ul/100ul. COL#56.



NAME YOLLA#1, DST#1, 2809-2824.5m. BRANCHED CYCLIC FRAGMENTOGRAM. FRN 5838
 MISC 29-10-85. GEC/GW. 0.2ul/100ul. COL#56.

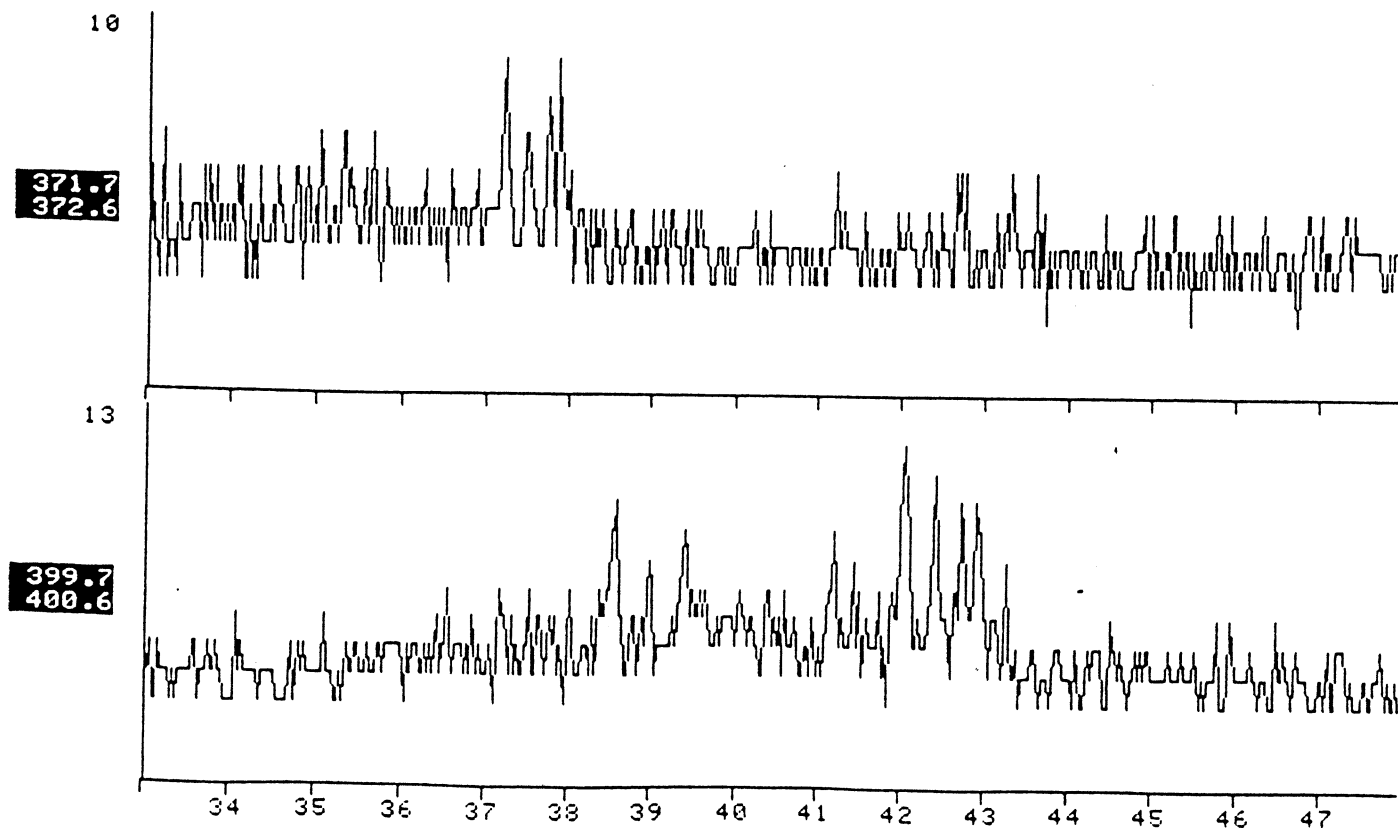
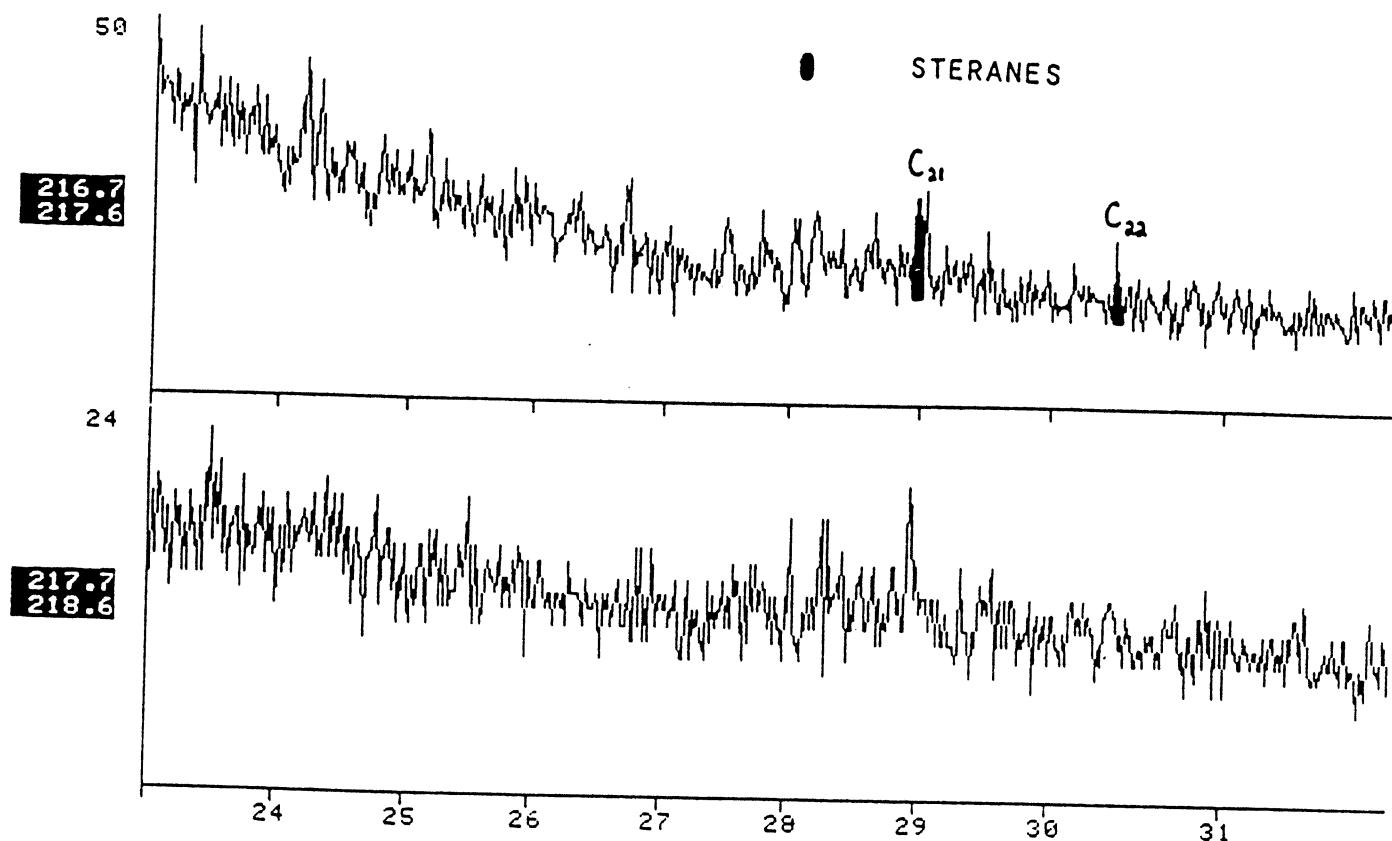


FIGURE 13-3

NAME YOLLA#1, DST#1, 2809-2824.5m. BRANCHED CYCLIC FRAGMENTOGRAM.
 MISC 29-10-85. GEC/GW. 0.2ul/100ul. COL#56.

FRN 5838



NAME YOLLA#1, DST#1, 2809-2824.5m. BRANCHED CYCLIC FRAGMENTOGRAM.
 MISC 29-10-85. GEC/GW. 0.2ul/100ul. COL#56.

FRN 5838

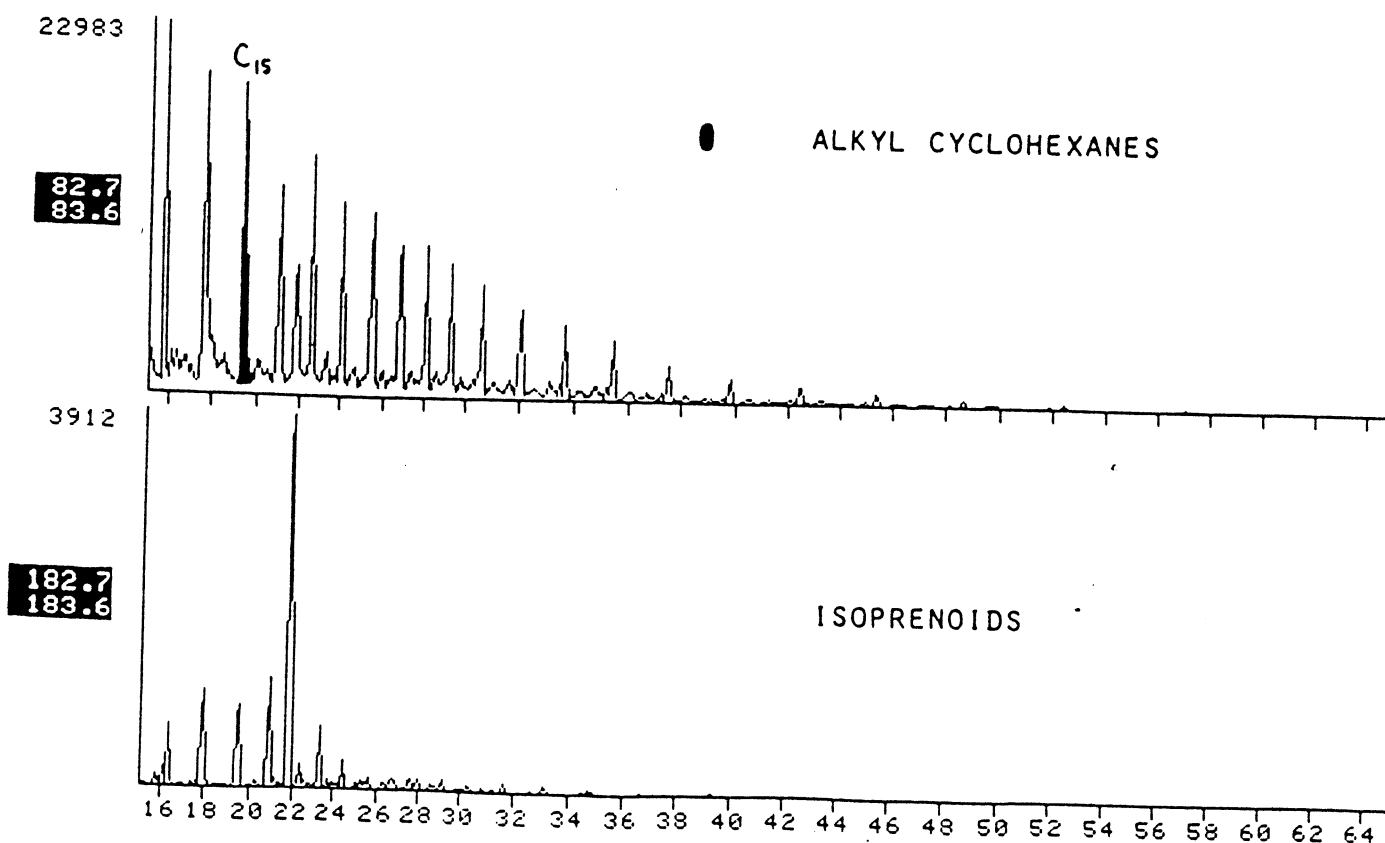
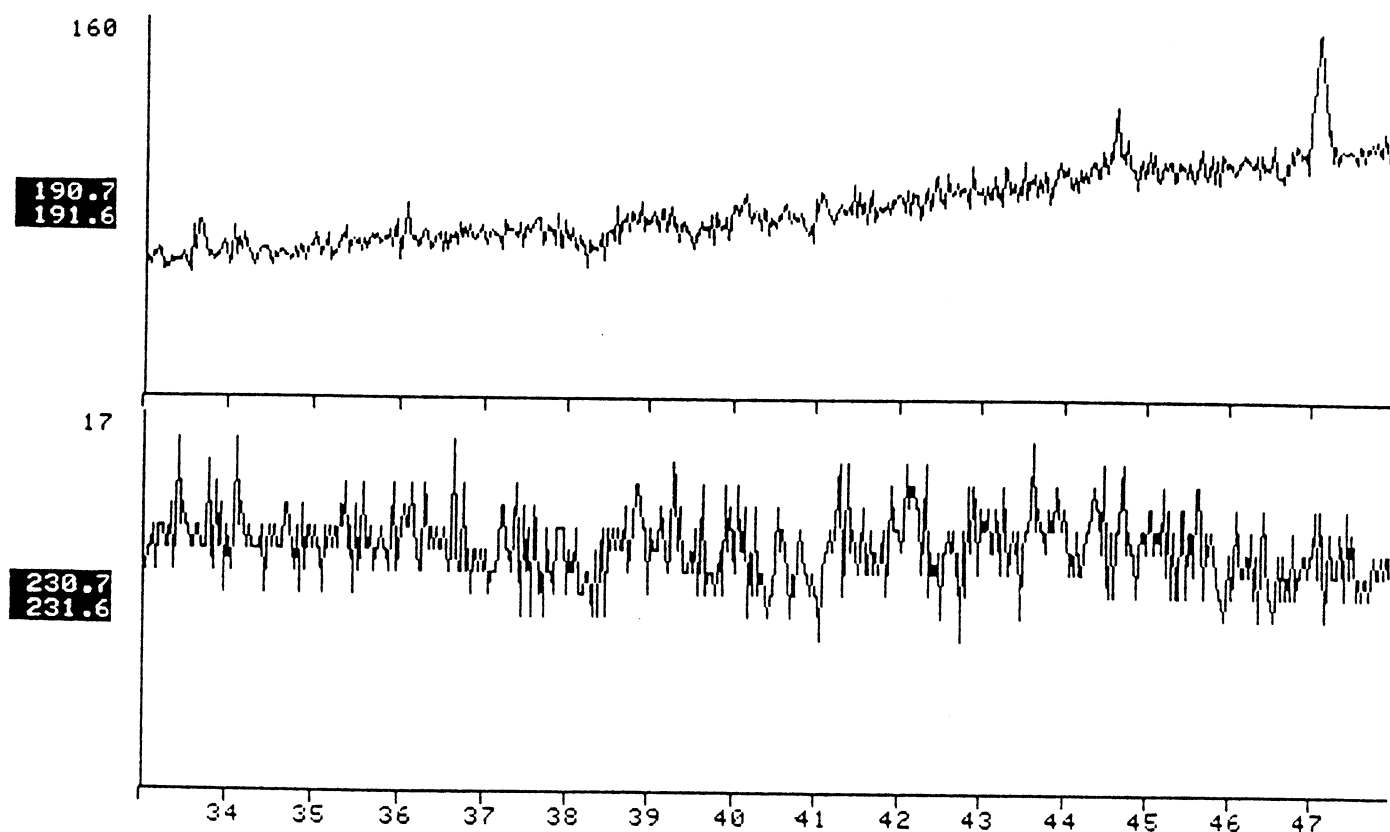


FIGURE 13-4

NAME YOLLA#1, DST#1, 2809-2824.5m. BRANCHED CYCLIC FRAGMENTOGRAM.
MISC 29-10-85. GEC/GW. 0.2ul/100ul. COL#56.

FRN 5838



NAME YOLLA#1, DST#1, 2809-2824.5m. BRANCHED CYCLIC FRAGMENTOGRAM.
MISC 29-10-85. GEC/GW. 0.2ul/100ul. COL#56.

FRN 5838

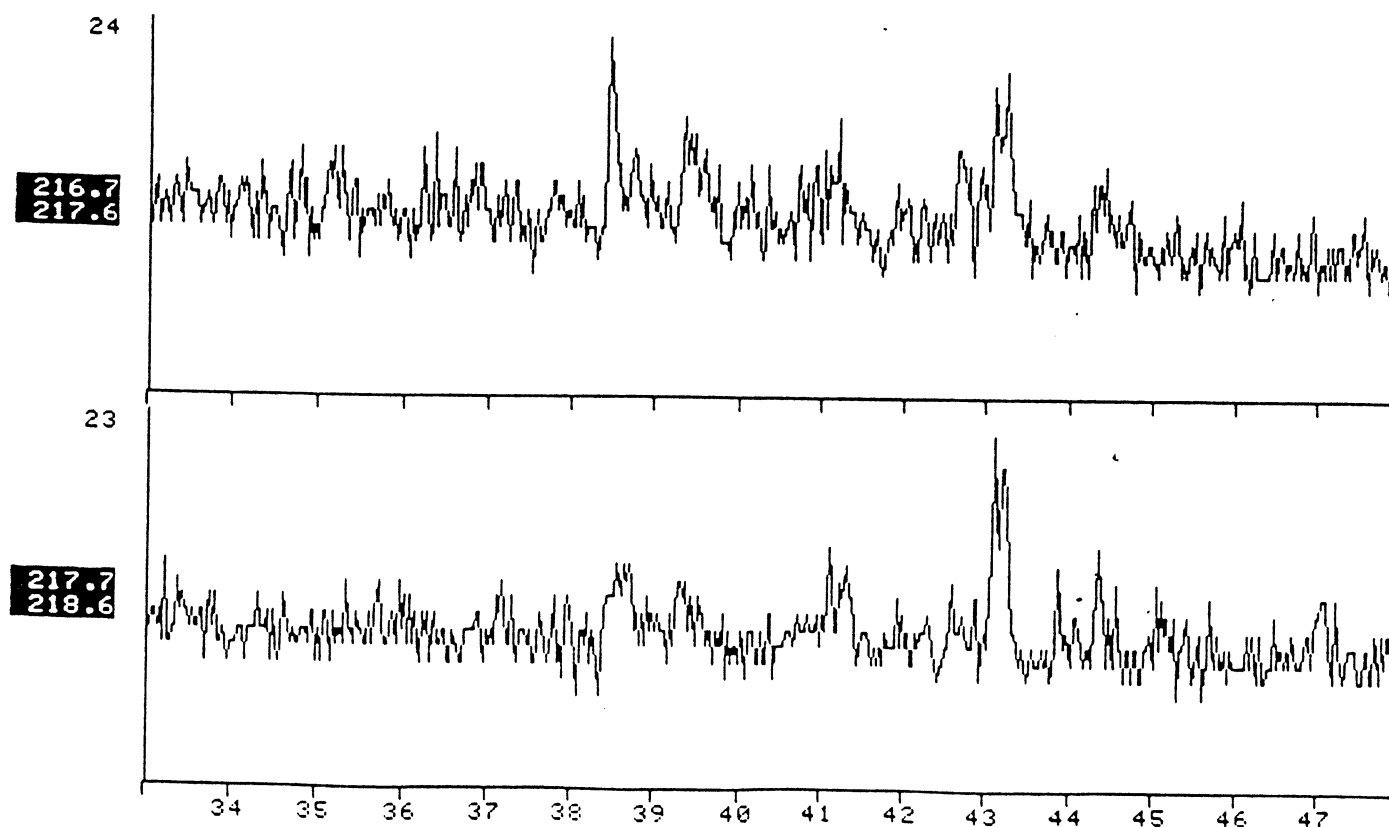
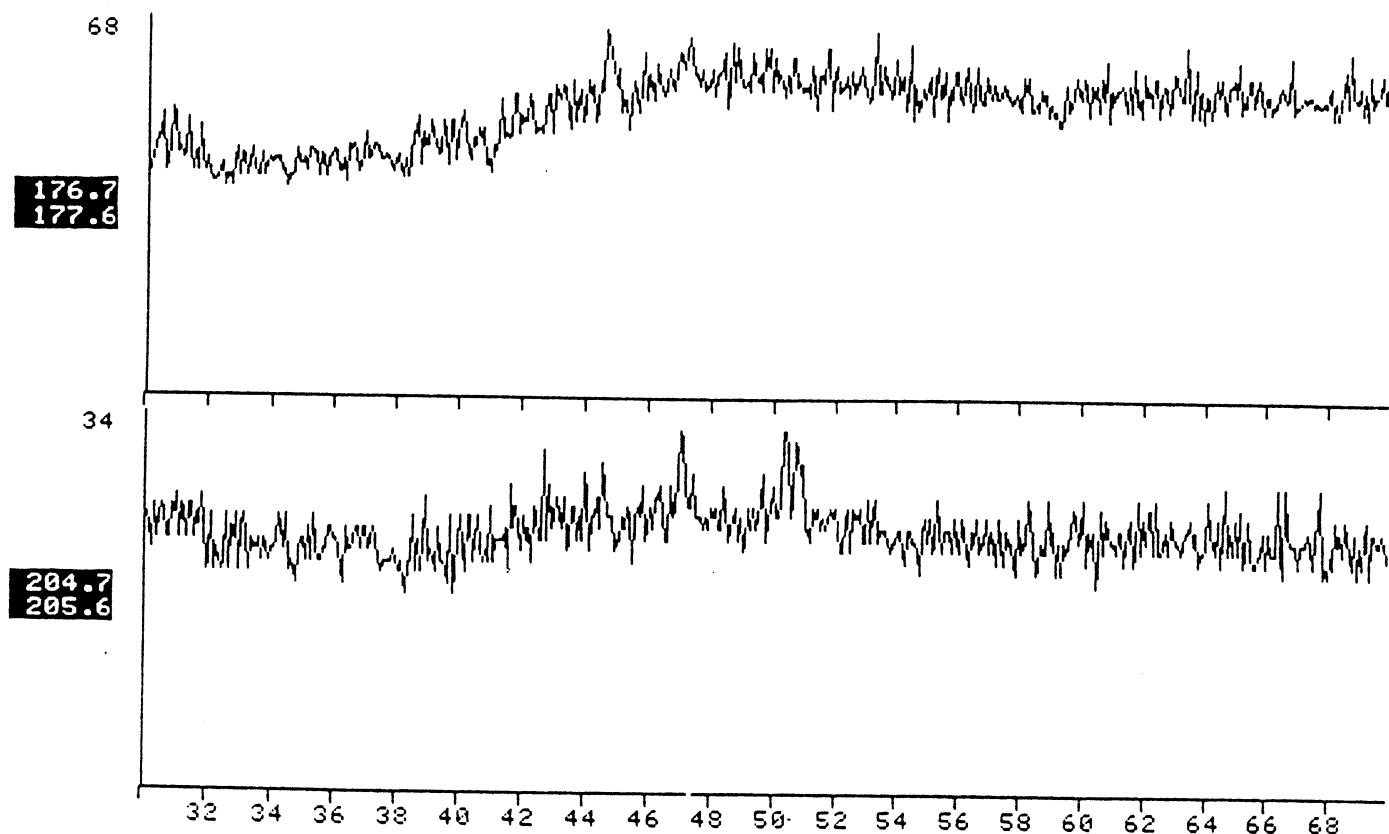


FIGURE 13-5

NAME YOLLA#1, DST#1, 2809-2824.5m. BRANCHED CYCLIC FRAGMENTOGRAM.
 MISC 29-10-85. GEC/GW. 0.2ul/100ul. COL#56.

FRN 5838



NAME YOLLA#1, DST#1, 2809-2824.5m. BRANCHED CYCLIC FRAGMENTOGRAM.
 MISC 29-10-85. GEC/GW. 0.2ul/100ul. COL#56.

FRN 5838

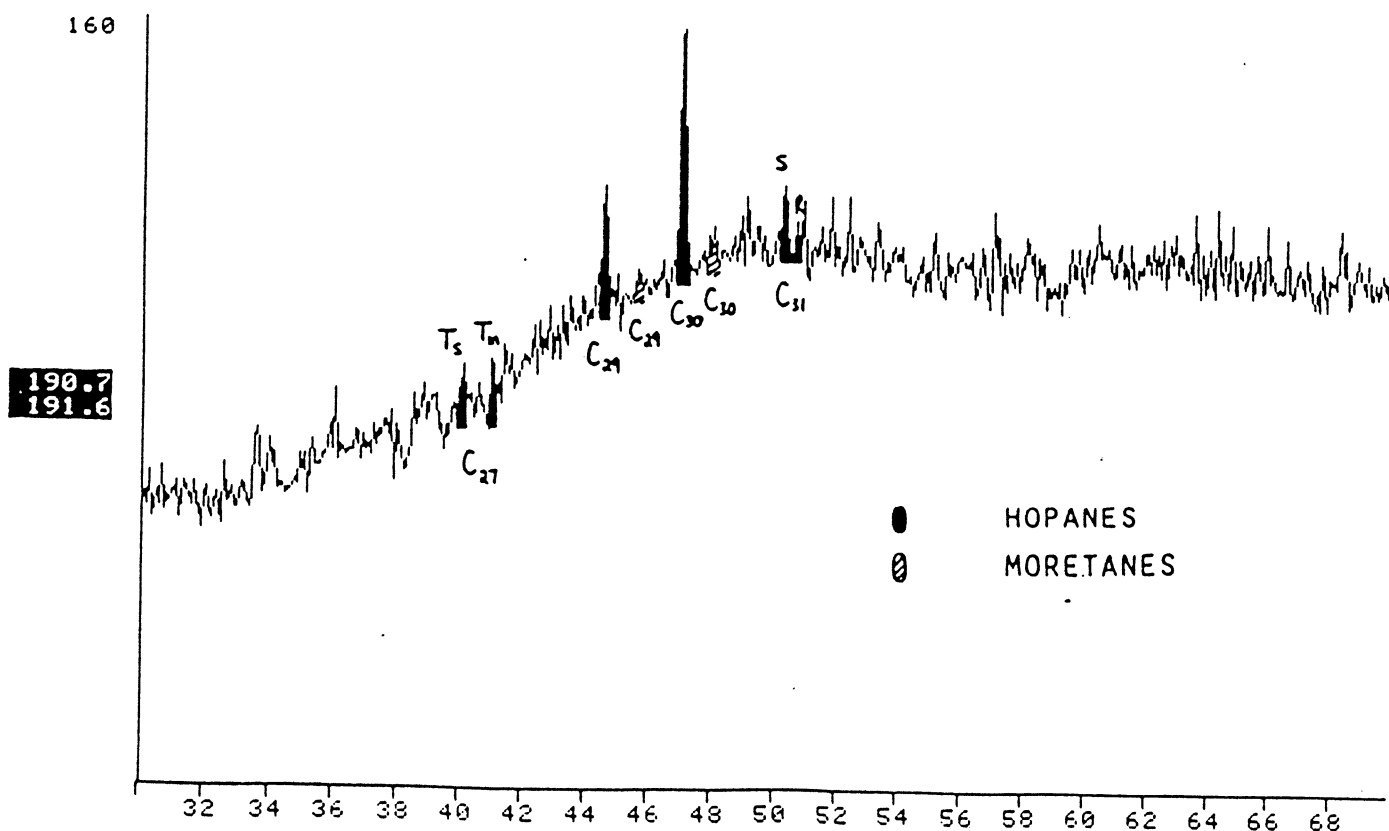


TABLE 13

ANALABS

ANALYTICAL CHEMISTS

52 Murray Road
Welshpool
W.A. 6106
Tel: 458 7999**CERTIFICATE OF ANALYSIS**For: Amoco Australia Petrol Co.
15 Blue Street
North Sydney
N.S.W. 2060

Our ref: 1000.01.39564

Your ref:

Date: 11.10.85

Description of Samples: One water sample was received on the
09.10.85 for chemical analysis.


Method of Analysis:

Sample No.

Chemical Data

Yolla #1 DST #2 10.00pm

pH		7.5	
Conductivity(u siemens/cm)		87000	
Resistivity (ohms/metre)		0.1149	
Total dissolved solids (calculated)		55680	
		<u>mg/l</u>	<u>m equiv/l</u>
Sodium	Na+	18400	800.3
Potassium	K+	549.5	14.05
Calcium	Ca++	1290	64.37
Magnesium	Mg++	1100	90.52
Soluble Iron Fe		<0.05	-
Chloride	Cl-	32380	912
Carbonate	CO3--	<0.3	-
Bi-Carbonate	HCO3-	600.2	9.84
Sulphate	SO4--	2435	50.73
Nitrate	NO3-	13.31	0.2147
Sum of Ions		56760	

Analyst:  T.R. STAKER B.Sc., A.R.A.C.I.
Chartered Chemist

THIS DOCUMENT MUST NOT BE REPRODUCED EXCEPT IN FULL

PETROLOGY AND GEOCHRONOLOGY

of

YOLLA 1

- PART I: SANDSTONE FROM CORE #1 AND IGNEOUS ROCK
PETROGRAPHY
- PART II: CORE #2 (3345-3346 m) AND JUNK SUB
SAMPLE (3173 m)
- PART III: FISSION TRACK ANALYSIS ON CORE #2 (3345 m)
AND JUNK SUB SAMPLE (3173 m)

Part I modified from report by
Dr Brian Steveson and Dr Alan Webb
of AMDEL

Part II modified from report by
Dr Alan Webb of AMDEL

Part III by Dr. Ian Duddy and
Dr. Paul Green of Geotrack International

INTRODUCTION

Seven core chips from Core #1 were studied petrologically for detailed information on this oil and gas-bearing reservoir. The sandstone consists of well sorted superfine (to coarse silt) quartz, with less than 5% lithic fragments. It has up to 20% clay matrix (dominantly kaolinite from XRD and SEM studies) and sideritic carbonate cement, although excellent porosity is preserved in the reservoir. The pore throats are less than 0.05 mm in size and strongly influenced by the presence of the kaolinitic matrix.

Further petrologic work consisted of identifying the composition of the intrusives and extrusives encountered during drilling. A number of ditch cuttings, junk sub samples and specimens from Core #2 were submitted for petrologic analysis and, on selected samples, geochronology was attempted.

The intrusive located within the Eastern View Coal Measures was confirmed as a fine to medium grained dolerite cum gabbro with generally fresh mineralisation. It proved suitable for K/Ar dating on the separated biotite and gave a late Oligocene age of 23.8 ± 0.2 Ma.

The extrusive penetrated below 3025 m in Yolla-1 is an altered amygdaloidal basalt. Virtually no primary minerals remain, but relict textures are often preserved and the basalt is both amygdaloidal and porphyritic in texture. The basalt has altered to mostly chlorite and carbonate with minor silica and zeolites with relict traces of original minerals and opaques. In general, these basalts, because of their extensive alteration, proved to be unsuitable to K/Ar dating. A lesser altered junk sub sample of the basalt, submitted for whole rock K/Ar analysis, returned an age of 54.1 ± 0.6 Ma. Since this rock had suffered some alteration it is thought that this age probably represents a minimum and may in fact may be as old as Paleocene or Late Cretaceous.

Fission track analysis was attempted on samples from both the dolerite and basalt without success. Apatite and zircons were recovered from the dolerite but at the present downhole temperature all fission tracks were erased from the dolerite. The few zircons recovered were consumed during the etching process. The basalt was devoid of apatite or zircon.

PART I - SANDSTONE FROM CORE #1 AND IGNEOUS ROCK PETROGRAPHY

SEDIMENTARY ROCKS

Seven core chip samples were analysed from Core #1 of Yolla-1. The depths are as follows (m):

1845.7 m	1846.2 m
1846.5 m	1846.8 m
1847.1 m	1847.4 m
1848.0 m	

Thin sections (TSC 45540-45546) were cut from each sample. Brief examination of the sections showed that the rocks are essentially the same and hence one overall description is given.

The section represents a remarkably well-sorted siltstone in which the average grain size is 0.05-0.07 mm and detrital grains in this size range comprise about 75% of the volume of the rock. Quartz is by far the most abundant detrital mineral and there is less than 5% (altogether) of lithic fragments, mica and heavy minerals. Feldspar is absent. Grains of quartz are angular (mostly) to subangular in shape and they fit closely together. Contacts are, however, mainly of the tangential type, rarely long and curved; hence the angularity is an integral feature of the detritus and not a result of diagenetic modifications. There are no quartz overgrowths. As far as can be determined, the quartz is of the common or plutonic variety, although the sorting suggests an immediate sedimentary provenance.

Small (~0.05 mm) patches of birefringent, heterogeneous clay are relics of lithic fragments deposited with the quartz. The rocks contain about 1% of clean detrital muscovite. Most of the flakes are distorted (due to compaction effects) and are not more than 0.1 mm in length.

Finally, the samples contain traces of tourmaline. As far as can be determined from the thin sections this mineral is decidedly rare at 1845.7 m but somewhat more abundant, for example at 1847.4 m. Tourmaline grains are subangular in shape and similar in size to adjacent quartz grains. Most show pale straw to yellow colours with a few also showing pale green tints. Zircon and opaques were occasionally noted among the terrigenous component.

The two other main components of these rocks are clay and carbonate and these together comprise about 20% of the samples. Carbonate is most abundant by far at 1845.7 m (15% carbonate) and 1846.8 m (7-10% carbonate); there are traces at 1847.1 m and none in the other sections. Brown clay represents 15-20% of all the thin sections.

At 1845.7 m the carbonate is siderite and it occurs about equally as widely disseminated crystals up to 0.1 mm in size and as large, monomineralic aggregates up to 0.5 mm in size. The disseminated material is patently authigenic, has partly replaced quartz and, in some instances, forms subidiomorphic crystals. In the large aggregates, the siderite has a notably granular texture and small individual crystals often have a dark core. This appears most likely to be siderite derived from alteration of original pyrite concentrations. At 1846.8 m most of the carbonate occurs in equant to lensoid concentrations similar to those at 1845.7 m.

The pervasive brown colour of the matrix clay is generally homogeneous and hence is derived from an original muddy matrix. The material is dark between crossed Nicols and commonly more or less obscured by ferruginous staining.

Given that core analysis shows a high porosity for this part of the geological section, it is thought likely that the pores seen in thin section are an integral part of the rocks (and not the result of the preparation of the sections). In general, porosity has a patchy distribution and is inversely related to the clay matrix. It appears that the pores are either primary (original intergranular space never filled with matrix) or are derived from the selective, patchy dissolution of some of the clay matrix. It is likely that at least some of the pores are secondary in origin; especially the somewhat larger ones. In general, the pores are less than 0.05 mm in size and are probably interconnected via narrow channelways restricted by the clay matrix.

Two samples were examined by X-ray diffraction analysis on both the bulk material (in the case of that from 1846.8 m) and the -2 μ m sedimented portion. The results are as follows:

X-ray diffraction analyses:

1846.8 m			1845.7 m	
Bulk Mineralogy	Quartz	D		
	Siderite	A-SD		
	Kaolinite	A		
	Halite	Tr		
	Pyrite	Tr		
	%	8		6
-2 μ m fraction	Kaolinite	D	Kaolinite	D
	Quartz	A	Quartz	A
	Mica/Illite	Tr-A	Mica/Illite	Tr-A
	Smectite	Tr	Smectite	Tr

The kaolinite is very well crystallised.

IGNEOUS ROCKS

Introduction

Four samples of drilling cuttings from Yolla No. 1 were received for evaluation of suitability for isotopic dating and any suitable material was to be dated urgently.

Procedures

The samples were washed to remove drilling mud and wet screened on 200 BS mesh (75 micron aperture). Thin sections were prepared from composite grain mounts of the dried samples.

The thin sections were examined but only one sample (from 2612-2621 m) was found to contain material suitable for dating. This sample was crushed and a biotite concentrate prepared for K and Ar analysis.

Petrographic Details

2612-2621 m

The rock is a medium to fine-grained gabbro, with a grain size ranging from 3 to 0.3 mm. The primary mineral components, in decreasing order of abundance, are clinopyroxene, plagioclase, hornblende, biotite, magnetite and apatite.

Plagioclase occurs as generally tabular grains and is extensively altered to sericite, zoisite/epidote, calcite and chlorite. Faint albite twinning can still be distinguished and occasional marginal zones or rims of slightly different composition can be seen.

The ferromagnesian minerals are generally fresh. The amphibole, a dark red-brown variety, appears in places to be replacing pyroxene but elsewhere, occurs as discrete grains with euhedral shape and well developed twinning.

Biotite is also a reddish-brown variety and is generally unaltered. Both biotite and hornblende could be used for K-Ar dating but the biotite may prove easier to concentrate.

Patches of a fibrous, colourless ?zeolite mineral are also present.

Apart from the alteration of the plagioclase, the rock is fresh and shows no sign of strain. A K-Ar date on biotite was used to give the age of crystallisation of this gabbro.

3034-3043 m

The drilling cutting in this sample, and in the following two samples, are much finer than those from 2612-2621 m. Many particles are monomineralic.

Carbonate particles are abundant and, as they do not stain with Alizarin Red-S, are probably dolomitic. Fine to medium grained olivine gabbro particles are common. The distinctive red-brown amphibole and biotite noted in 2612-2621 m are present but the plagioclase is remarkably fresh and olivine was not noted in the higher sample.

Fine-grained micaceous siltstone chips (some with carbonate), coal fragments and occasional quartzite are also present.

There is no material in this sample that could be used from isotopic dating.

3061-3070 m

Many fragments in this sample are monomineralic. Carbonate (mainly dolomite but also some calcite) is common, both as single particles and within fragments of basalt. Coarser-grained gabbroic material (described above) is present and quartz is much more abundant.

The major new lithology present is basalt. One slightly coarser-grained and plagioclase-rich fragment was noted but most chips contain plagioclase laths smaller than 300 x 30 microns with fine, intergranular pyroxene approximately 30 microns in size and abundant opaque granules. Chlorite

is a common interstitial replacement mineral and also occurs as patches which may represent small (100 microns) altered phenocrysts. Irregularly shaped patches of dolomite are common in the basalt. The alteration products and the presences of carbonate make the basaltic phase unsuitable for dating.

3142-3151 m

These chips are predominantly fine-grained, plagioclase-rich basalt. Plagioclase laths, generally less than 100 microns in length and small pyroxene grains up to 40 microns in size are set in a feldspathic matrix. Chlorite is common throughout the rock and perhaps also as a replacement of phenocrysts. Small opaque Fe oxide granules are common.

Calcite occurs both as veins and associated with chloride as a phenocryst replacement.

The sample is too altered to be used for dating.

Bulk Magnetic Susceptibility

The bulk susceptibility of the three samples between 3034 and 3151 m are given in Table 1.

Table 1: Bulk Magnetic Susceptibility

Sample	Bulk Magnetic Susceptibility (SI Units)
3034-3043 m	700×10^{-5}
3061-3070 m	1200×10^{-5}
3142-3151 m	2000×10^{-5}

Geochronology

The K and Ar analyses and calculated K-Ar age for biotite from 2612-2621 m are given in Table 2. The age of 23.8 Ma falls on the Oligocene-Miocene boundary.

Table 2: Potassium-Argon Results

Sample	%K	$^{40}\text{Ar}^*$ ($\times 10^{-10}$ moles/g)	$^{40}\text{Ar}^*/^{40}\text{Ar}$ Total	Age**
Biotite 2612-2621 m	6.37 6.38	2.6508	0.823	23.8 ± 0.2

* Denotes radiogenic ^{40}Ar .

** Age in Ma with error limits given for the analytical uncertainty at one standard deviation.

Constants: ^{40}K = 0.01167 atom %
 λ = $4.962 \times 10^{-10} \text{ y}^{-1}$
 ϵ = $0.581 \times 10^{-10} \text{ y}^{-1}$

PART II - CORE #2 (3345-3346 m) AND JUNK SUB SAMPLE (3173 m)

INTRODUCTION

A section of Core #2 was analysed for K-Ar age determination and magnetic susceptibility measurements.

PROCEDURE

A visual examination of the core suggested that the rock was fairly homogeneous and so two thin sections, from 3345.1 m and 3345.8 m, were prepared (TSC 45791, 45792).

Microscopic examination of the sections indicated that the core was unsuitable for geochronology. An attempt was then made to date a sample of basalt submitted earlier (Junk Sub. 3173 m). This sample was originally rejected for dating because it contained carbonate and chloritic alteration but re-evaluation of the thin section suggested that much of the alteration to chlorite was from a non K-bearing phase (possibly olivine). The loss of argon due to alteration of the primary phases may therefore not have been as severe as originally thought.

A total rock sample was prepared by crushing the rock and screening out the 0.85-0.25 mm fraction. In an attempt to remove any surface or exposed vein carbonate before analysis, this fraction was washed in dilute hydrochloric acid, rinsed in water and dried. A portion of the 0.85-0.25 mm fraction was pulverised and analysed for K. The remaining material was analysed for radiogenic argon.

MAGNETIC SUSCEPTIBILITY

Several measurements of magnetic susceptibility were made at 0.1 m intervals along the core. These measurements fall into two groups, listed below in Table 1:

Table 1: Magnetic Susceptibility Measurements (SI Units)

Uppermost 0.1 m	:	65-85 x 10 ⁻⁶
Remaining core	:	150-250 x 10 ⁻⁶

PETROGRAPHIC DESCRIPTIONS

Yolla No. 1, 3345-3346 m, TSC 45971, 45972

Rock Name: Altered amygdaloidal basalt.

The two samples, from 3345.1 and 3345.8 m are similar in most respects and a single description of the two samples is given, with special mention being made of features present in only one of the sections.

The rock is so extensively altered that virtually none of the primary mineral phases remain. However, many of the original textures can still be distinguished. The rock is basaltic in nature and shows amygdaloidal, porphyritic and fluidal textures.

The amygdales are rounded to oval and, in the thin section, are up to 5.0 mm in diameter. Their abundance is difficult to estimate but they comprise possibly 25-30% of the rock. The amygdales are composed predominantly of carbonate and chlorite, sometimes showing a concentric mineral zoning. Silica is also common, both as quartz and chalcedony and is particularly well developed in the amygdales at 3345.8 m.

Altered phenocrysts up to 1 mm in length make up 10-15% of the rock. Crystal outlines are well preserved and suggest that both olivine and pyroxene were once present. Rare traces of pyroxene remain but the phenocrysts are almost totally replaced by chlorite and secondary micaceous minerals.

Plagioclase occurs mainly in the groundmass although a few laths up to 0.6 mm in length may be classed as phenocrysts. Most lath-like shapes are less than 0.2 mm in length and about 0.02 mm in width. The groundmass is now replaced by chlorite and weakly anisotropic zeolites. Small patches of carbonate are abundant, scattered throughout the groundmass, and appear to be replacing plagioclase.

A poorly defined fluidal texture is enhanced by the distribution of opaque grains along the prismatic sides of the plagioclase laths. The opaques comprise about 5% of the rock and are frequently elongated and of irregular shape, suggesting that much of it may be of secondary origin, e.g. exsolved or redistributed Ti oxides.

These samples are far too altered to be suitable for K-Ar dating and the high carbonate content would make such work technically impossible.

Yolla No. 1, Junk Sub. 3173 m, TSC 45650

This sample of basalt was initially rejected as being too altered for dating but was re-examined after the above samples were rejected.

This rock is a fine-grained porphyritic basalt in which the phenocrysts have been altered to a pale green serpentine/chlorite mixture, with minor carbonate.

Very fresh, fine, plagioclase laths, up to 0.1 mm in length and small (up to 0.040 mm) granules of fresh pyroxene are set in a mainly feldspathic groundmass that shows an incipient pale green almost isotropic(?) alteration. The interstitial nature of some of this material suggests that it may be partly glassy.

Very fine flakes of biotite are present in minor amounts.

Black opaque Fe oxide granules, often with square outlines, make up 5-7% of the rock.

The alteration of the phenocrysts (which contained virtually no potassium) would not affect the suitability of the sample for dating but the late stage phases of the groundmass, in which the K is normally concentrated, also show signs of alteration. Consequently, K-Ar dating can be expected to give only a minimum estimate of the age of crystallisation.

The presence of small amounts of carbonate may not present an insurmountable difficulty in the argon extraction procedure and could possibly be removed (or partly removed) by washing the sample in dilute hydrochloric acid.

PART III - FISSION TRACK ANALYSIS ON CORE #2 (3345 m) AND JUNK SUB SAMPLE (3173 m)

SUMMARY

An unsuccessful attempt was made to date the volcanics near T.D. in Yolla-1 using fission track analysis. Although apatite was recovered from a doleritic rock, the present downhole temperature of approx. 140°C is in excess of that required to erase all fission tracks in this mineral, so no age data was possible. Insufficient zircon was present for analysis in the samples submitted, but this mineral could provide an age date at ambient temperatures below about 200°C.

SAMPLES AND SUITABILITY

A 1 kg sample of altered vesicular basalt from core #2, Yolla-1 and a junk basket sample from 3173 m which contained approx. 90 g of a medium to coarse grained doleritic rock were received for analysis (Table 1).

The mineral separation procedure recovered a good apatite yield from the junk basket sample (8522-129) but only a few probable grains of zircon. The basalt sample (8522-130) contained no apatite or zircon.

TECHNIQUES

Apatites were mounted in epoxy resin on glass slides, polished and etched for 20 sec. in 5M HNO₃ at 20°C to reveal the fossil fission tracks. Zircons were mounted in FEP teflon and etched in a molten eutectic of NaOH:KOH at 210°C for several hours.

RESULTS

No tracks were revealed in the apatite sample (8522-129) after the etching procedure due to the present downhole temperature of this sample being in excess of approx. 125°C (Gleadow et al., 1983). For times of the order of 10 Myr at this temperature, all fission tracks in this mineral are erased.

The few grains of probable zircon recovered from 8522-129 did not survive the etching step and the sample was therefore abandoned.

CONCLUSIONS

1. Fission track analysis for age dating purposes at present downhole temperatures in excess of approx. 125°C require the presence of zircon.
2. In the majority of cases basalts do not provide sufficient zircon for analysis.
3. Coarse-grained doleritic rocks often contain some zircon, but approx. 1 kg of rock sample is usually required to be certain of a reasonable yield.

Table 1: Sample Details and Mineral Yields

Sample Number	Depth	Sample Description (mass)	Age	Apatite Yield	Zircon Yield
8522-129	3173 m (junk)	dolerite (95 g)		Good	Insuff.
8522-130	3345 m (core 2)	Vesic. Basalt (1 kg)		None	None

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VERTICAL SEISMIC PROFILE
for
YOLLA-1

INTRODUCTION (See enclosures 5, 6 and 7)

A Vertical Seismic Profile was shot in the Yolla-1 well on 10 September 1985. One hundred and forty-one levels from 500 m to 3314 m below KB were shot using an airgun source and WST tool. Because the top levels to 940 m were corrupted by casing arrivals and first breaks could not be picked accurately, no levels above 670 m were used in the seismic processing and only one hundred and twenty five levels have been used in processing the Vertical Seismic Profile. A Geogram was computed using the VSP levels to calibrate the sonic log. One hundred and thirteen levels were used for the Geogram processing.

All shot times and the calibrated sonic have been corrected to a nominal Mean Sea Level Datum.

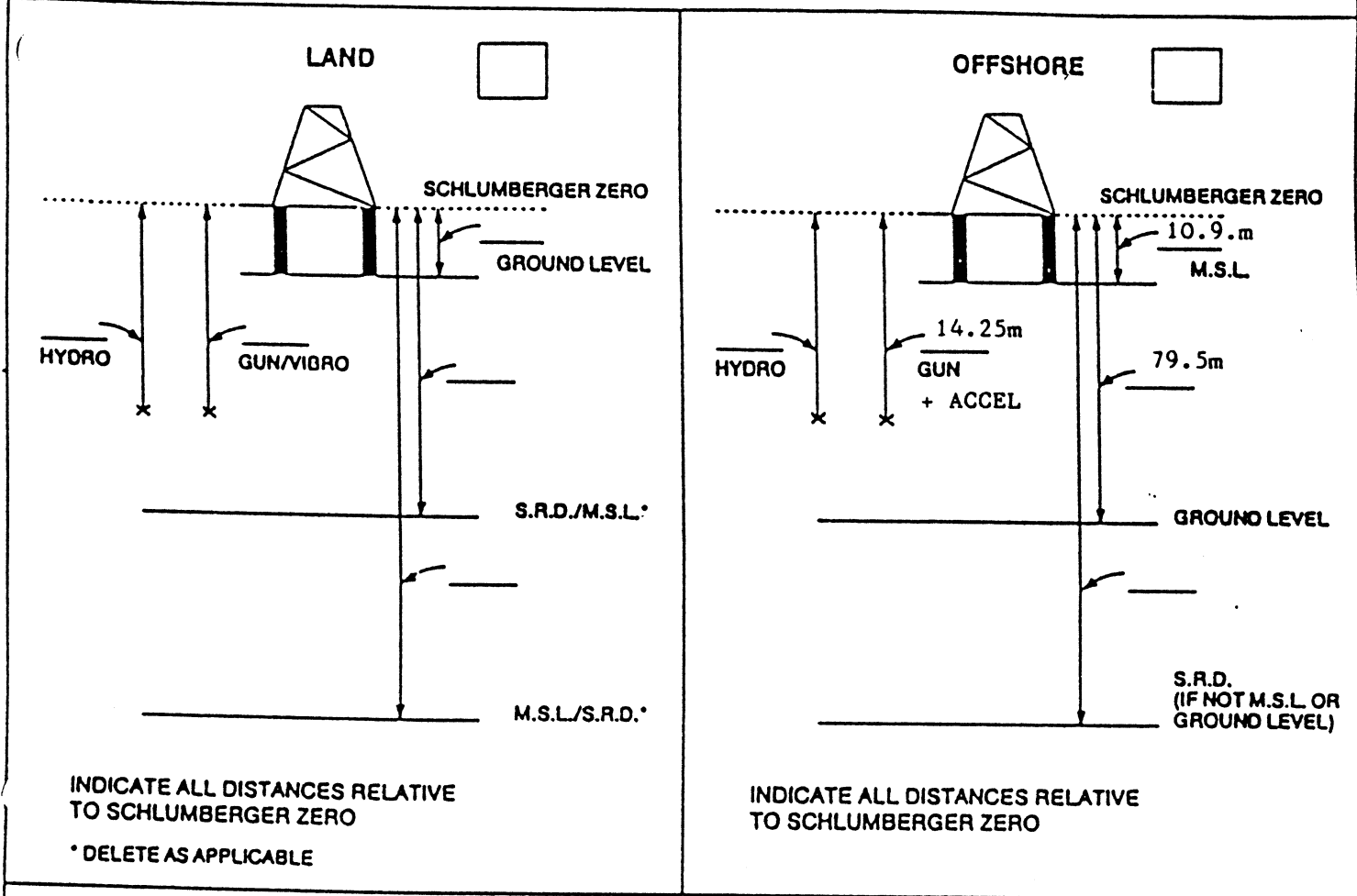


GUN GEOMETRY SKETCH

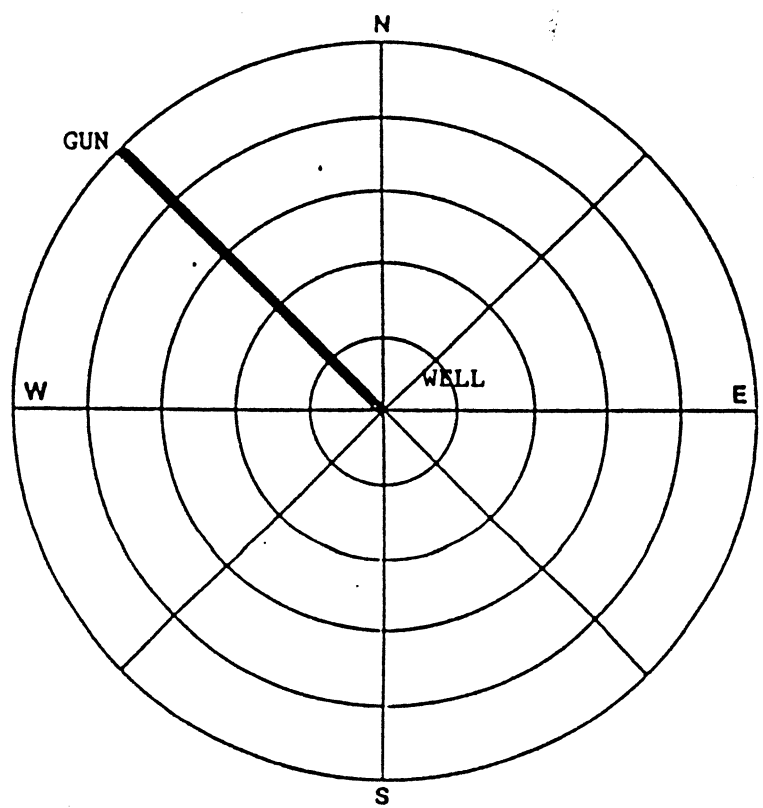
CLIENT: AMOCO

WELL: YOLLA #1

DATE: 9.9.85



SHOT POS'N	GUN OFFSET	ACCEL OFFSET	GUN DEPTH	ACCEL DEPTH
1	37m	37m	3.35m	3.35m
2				
3				
4				
5				
6				
7				



INDICATE GUN/VIBRO AND HYDROPHONE OFFSET AND AZIMUTH RELATIVE TO NORTH

COMPANY : AMOCO AUSTRALIA PETROLEUM CO WELL : YOLLA #1

LEVEL NUMBER	MEASUR DEPTH FROM KB M	VERTIC DEPTH FROM SRD M	VERTIC DEPTH FROM GL M	OBSERV TRAVEL TIME HYD/GEO MS	VERTIC TRAVEL TIME SRC/GEO MS	VERTIC TRAVEL TIME SRD/GEO MS	AVERAGE VELOC SRD/GEO M/S	DELTA DEPTH BETWEEN SHOTS M	DELTA TIME BETWEEN SHOTS MS	INTERV VELOC BETWEEN SHOTS M/S
1	79.50	68.60	0	50.00	43.49	45.73	1500			
2	415.00	404.10	335.50	191.00	190.19	192.42	2100	335.50	146.70	2287
3	940.00	929.10	860.50	403.00	402.68	404.91	2296	525.00	212.49	2471
4	1000.00	989.10	920.50	433.00	432.70	434.93	2274	60.00	30.02	1999
5	1060.00	1049.10	980.50	464.00	463.71	465.94	2252	60.00	31.01	1935
6	1080.00	1069.10	1000.50	471.00	470.72	472.95	2260	20.00	7.01	2854
7	1100.00	1089.10	1020.50	484.00	483.72	485.95	2241	20.00	13.00	1538
8	1120.00	1109.10	1040.50	489.00	488.73	490.96	2259	20.00	5.01	3994
9	1140.00	1129.10	1060.50	497.00	496.73	498.97	2263	20.00	8.01	2498
10	1160.00	1149.10	1080.50	509.00	508.73	510.97	2249	20.00	12.00	1666
11	1200.00	1189.10	1120.50	526.00	525.74	527.98	2252	40.00	17.01	2352
12	1260.00	1249.10	1180.50	552.00	551.76	553.99	2255	60.00	26.01	2307
13	1280.00	1269.10	1200.50	560.00	559.76	561.99	2258	20.00	8.00	2499
14	1304.00	1293.10	1224.50	569.00	568.77	571.00	2265	24.00	9.01	2665
15	1320.00	1309.10	1240.50	575.00	574.77	577.00	2269	16.00	6.00	2665
16	1340.00	1329.10	1260.50	581.00	580.77	583.01	2280	20.00	6.00	3331
17	1360.00	1349.10	1280.50	587.00	586.78	589.01	2290	20.00	6.00	3331
18	1380.00	1369.10	1300.50	594.00	593.78	596.02	2297	20.00	7.00	2856
19	1400.00	1389.10	1320.50	600.00	599.79	602.02	2307	20.00	6.00	3331
20	1420.00	1409.10	1340.50	607.00	606.79	609.02	2314	20.00	7.00	2856
21	1440.00	1429.10	1360.50	614.00	613.79	616.03	2320	20.00	7.00	2856
22	1460.00	1449.10	1380.50	620.00	619.80	622.03	2330	20.00	6.00	3331
23	1480.00	1469.10	1400.50	627.00	626.80	629.03	2335	20.00	7.00	2856
24	1500.00	1489.10	1420.50	633.00	632.80	635.04	2345	20.00	6.00	3331

COMPANY : AMOCO AUSTRALIA PETROLEUM CO WELL : YOLLA #1

LEVEL NUMBER	MEASUR DEPTH FROM KB M	VERTIC DEPTH FROM SRD M	VERTIC DEPTH FROM GL M	OBSERV TRAVEL TIME HYD/GEO MS	VERTIC TRAVEL TIME SRC/GEO MS	VERTIC TRAVEL TIME SRD/GEO MS	AVERAGE VELOC SRD/GEO M/S	DELTA DEPTH BETWEEN SHOTS M	DELTA TIME BETWEEN SHOTS MS	INTERV VELOC BETWEEN SHOTS M/S
25	1520.00	1509.10	1440.50	640.00	639.81	642.04	2350	20.00	7.00	2856
26	1540.00	1529.10	1460.50	646.00	645.81	648.04	2360	20.00	6.00	3331
27	1560.00	1549.10	1480.50	651.00	650.81	653.05	2372	20.00	5.00	3997
28	1670.00	1559.10	1490.50	654.00	653.82	656.05	2377	10.00	3.00	3332
29	1580.00	1569.10	1500.50	659.00	658.82	661.05	2374	10.00	5.00	2000
30	1600.00	1589.10	1520.50	665.00	664.82	667.05	2382	20.00	6.00	3332
31	1620.00	1609.10	1540.50	672.00	671.82	674.06	2387	20.00	7.00	2856
32	1640.00	1629.10	1560.50	678.00	677.82	680.06	2396	20.00	6.00	3332
33	1660.00	1649.10	1580.50	683.00	682.83	685.06	2407	20.00	5.00	3998
34	1670.00	1659.10	1590.50	687.00	686.83	689.06	2408	10.00	4.00	2499
35	1680.00	1669.10	1600.50	691.00	690.83	693.06	2408	10.00	4.00	2499
36	1700.00	1689.10	1620.50	697.00	696.83	699.07	2416	20.00	6.00	3332
37	1720.00	1709.10	1640.50	705.00	704.83	707.07	2417	20.00	8.00	2499
38	1740.00	1729.10	1660.50	712.00	711.84	714.07	2421	20.00	7.00	2856
39	1760.00	1749.10	1680.50	720.00	719.84	722.07	2422	20.00	8.00	2499
40	1780.00	1769.10	1700.50	726.00	726.84	728.07	2430	20.00	6.00	3332
41	1800.00	1789.10	1720.50	733.00	732.84	735.08	2434	20.00	7.00	2856
42	1820.00	1809.10	1740.50	739.00	738.84	741.08	2441	20.00	6.00	3332
43	1840.00	1829.10	1760.50	746.00	745.85	748.08	2445	20.00	7.00	2856
44	1860.00	1849.10	1780.50	753.00	752.85	755.08	2449	20.00	7.00	2856
45	1880.00	1869.10	1800.50	759.00	758.85	761.08	2456	20.00	6.00	3332
46	1900.00	1889.10	1820.50	766.00	765.85	768.09	2459	20.00	7.00	2856
47	1920.00	1909.10	1840.50	771.00	770.85	773.09	2469	20.00	5.00	3998
48	1940.00	1929.10	1860.50	778.00	777.86	780.09	2473	20.00	7.00	2856

COMPANY : AMOCO AUSTRALIA PETROLEUM CO WELL : YOLLA #1

LEVEL NUMBER	MEASUR DEPTH FROM KB M	VERTIC DEPTH FROM SRD M	VERTIC DEPTH FROM GL M	OBSERV TRAVEL TIME HYD/GEO MS	VERTIC TRAVEL TIME SRC/GEO MS	VERTIC TRAVEL TIME SRD/GEO MS	AVERAGE VELOC SRD/GEO M/S	DELTA DEPTH BETWEEN SHOTS M	DELTA TIME BETWEEN SHOTS MS	INTERV VELOC BETWEEN SHOTS M/S
49	1960.00	1949.10	1880.50	783.00	782.86	785.09	2483	20.00	5.00	3998
50	1980.00	1969.10	1900.50	790.00	789.86	792.09	2486	20.00	7.00	2856
51	2000.00	1989.10	1920.50	797.00	796.86	799.10	2489	20.00	7.00	2857
52	2020.00	2009.10	1940.50	803.00	802.86	805.10	2495	20.00	6.00	3332
53	2040.00	2029.10	1960.50	808.00	807.87	810.10	2505	20.00	5.00	3999
54	2060.00	2049.10	1980.50	813.00	812.87	815.10	2514	20.00	5.00	3999
55	2080.00	2069.10	2000.50	821.00	820.87	823.10	2514	20.00	8.00	2500
56	2100.00	2089.10	2020.50	827.00	826.87	829.10	2520	20.00	6.00	3332
57	2120.00	2109.10	2040.50	833.00	832.87	835.10	2526	20.00	6.00	3332
58	2140.00	2129.10	2060.50	840.00	839.87	842.11	2528	20.00	7.00	2857
59	2160.00	2149.10	2080.50	847.00	846.87	849.11	2531	20.00	7.00	2857
60	2180.00	2169.10	2100.50	855.00	854.88	857.11	2531	20.00	8.00	2500
61	2200.00	2189.10	2120.50	862.00	861.88	864.11	2533	20.00	7.00	2857
62	2220.00	2209.10	2140.50	867.00	866.88	869.11	2542	20.00	5.00	3999
63	2240.00	2229.10	2160.50	875.00	874.88	877.11	2541	20.00	8.00	2500
64	2260.00	2249.10	2180.50	880.00	879.88	882.11	2550	20.00	5.00	3999
65	2280.00	2269.10	2200.50	886.00	885.88	888.12	2555	20.00	6.00	3333
66	2290.00	2279.10	2210.50	890.00	889.88	892.12	2555	10.00	4.00	2500
67	2310.00	2299.10	2230.50	895.00	894.88	897.12	2563	20.00	5.00	3999
68	2330.00	2319.10	2250.50	902.00	901.88	904.12	2565	20.00	7.00	2857
69	2350.00	2339.10	2270.50	907.00	906.89	909.12	2573	20.00	5.00	3999
70	2370.00	2359.10	2290.50	917.00	916.89	919.12	2567	20.00	10.00	2000
71	2390.00	2379.10	2310.50	922.00	921.89	924.12	2574	20.00	5.00	3999
72	2410.00	2399.10	2330.50	928.00	927.89	930.12	2579	20.00	6.00	3333

COMPANY : AMOCO AUSTRALIA PETROLEUM CO WELL : YOLLA #1

LEVEL NUMBER	MEASUR DEPTH FROM KB M	VERTIC DEPTH FROM SRD M	VERTIC DEPTH FROM GL M	OBSERV TRAVEL TIME HYD/GEO MS	VERTIC TRAVEL TIME SRC/GEO MS	VERTIC TRAVEL TIME SRD/GEO MS	AVERAGE VELOC SRD/GEO M/S	DELTA DEPTH BETWEEN SHOTS M	DELTA TIME BETWEEN SHOTS MS	INTERV VELOC BETWEEN SHOTS M/S
73	2430.00	2419.10	2350.50	933.00	932.89	935.12	2587	20.00	5.00	3999
74	2450.00	2439.10	2370.50	938.00	937.89	940.13	2594	20.00	5.00	3999
75	2470.00	2459.10	2390.50	943.00	942.89	945.13	2602	20.00	5.00	3999
76	2490.00	2479.10	2410.50	949.00	948.89	951.13	2606	20.00	6.00	3333
77	2510.00	2499.10	2430.50	953.00	952.90	955.13	2617	20.00	4.00	4998
78	2530.00	2519.10	2450.50	956.00	955.90	958.13	2629	20.00	3.00	6664
79	2550.00	2539.10	2470.50	966.00	965.90	968.13	2623	20.00	10.00	2000
80	2570.00	2559.10	2490.50	969.00	968.90	971.13	2635	20.00	3.00	6664
81	2590.00	2579.10	2510.50	974.00	973.90	976.13	2642	20.00	5.00	3999
82	2600.00	2589.10	2520.50	979.00	978.90	981.13	2639	10.00	5.00	2000
83	2620.00	2609.10	2540.50	982.00	981.90	984.13	2651	20.00	3.00	6663
84	2640.00	2629.10	2560.50	985.00	984.90	987.14	2663	20.00	3.00	6664
85	2660.00	2649.10	2580.50	989.00	988.90	991.14	2673	20.00	4.00	4999
86	2680.00	2669.10	2600.50	994.00	993.90	996.14	2679	20.00	5.00	3999
87	2700.00	2689.10	2620.50	998.00	997.91	1000.14	2689	20.00	4.00	4999
88	2720.00	2709.10	2640.50	1005.00	1004.91	1007.14	2690	20.00	7.00	2857
89	2740.00	2729.10	2660.50	1009.00	1008.91	1011.14	2699	20.00	4.00	4999
90	2760.00	2749.10	2680.50	1014.00	1013.91	1016.14	2705	20.00	5.00	3999
91	2780.00	2769.10	2700.50	1017.00	1016.91	1019.14	2717	20.00	3.00	6664
92	2800.00	2789.10	2720.50	1022.00	1021.91	1024.14	2723	20.00	5.00	3999
93	2820.00	2809.10	2740.50	1026.00	1025.91	1028.14	2732	20.00	4.00	4999
94	2840.00	2829.10	2760.50	1034.00	1033.91	1036.14	2730	20.00	8.00	2500
95	2860.00	2849.10	2780.50	1042.00	1041.91	1044.15	2729	20.00	8.00	2500
96	2880.00	2869.10	2800.50	1046.00	1045.91	1048.15	2737	20.00	4.00	4999

COMPANY : AMOCO AUSTRALIA PETROLEUM CO WELL : YOLLA #1

LEVEL NUMBER	MEASUR DEPTH FROM KB M	VERTIC DEPTH FROM SRD M	VERTIC DEPTH FROM GL M	OBSERV TRAVEL TIME HYD/GEO MS	VERTIC TRAVEL TIME SRC/GEO MS	VERTIC TRAVEL TIME SRD/GEO MS	AVERAGE VELOC SRD/GEO M/S	DELTA DEPTH BETWEEN SHOTS M	DELTA TIME BETWEEN SHOTS MS	INTERV VELOC BETWEEN SHOTS M/S
97	2900.00	2889.10	2820.50	1051.00	1050.91	1053.15	2743	20.00	5.00	3999
98	2925.00	2914.10	2845.50	1057.00	1056.91	1059.15	2751	25.00	6.00	4166
99	2965.00	2954.10	2885.50	1066.00	1065.92	1068.15	2766	40.00	9.00	4444
100	3000.00	2989.10	2920.50	1074.00	1073.92	1076.15	2778	35.00	8.00	4374
101	3025.00	3014.10	2945.50	1079.00	1078.92	1081.15	2788	25.00	5.00	4999
102	3060.00	3049.10	2980.50	1089.00	1088.92	1091.15	2794	35.00	10.00	3500
103	3080.00	3069.10	3000.50	1094.00	1093.92	1096.15	2800	20.00	5.00	3999
104	3100.00	3089.10	3020.50	1099.00	1098.92	1101.15	2805	20.00	5.00	4000
105	3120.00	3109.10	3040.50	1104.00	1103.92	1106.16	2811	20.00	5.00	3999
106	3140.00	3129.10	3060.50	1110.00	1109.92	1112.16	2814	20.00	6.00	3333
107	3160.00	3149.10	3080.50	1115.00	1114.92	1117.16	2819	20.00	5.00	4000
108	3180.00	3169.10	3100.50	1120.00	1119.92	1122.16	2824	20.00	5.00	3999
109	3200.00	3189.10	3120.50	1126.00	1125.92	1128.16	2827	20.00	6.00	3333
110	3220.00	3209.10	3140.50	1129.00	1128.92	1131.16	2837	20.00	3.00	6665
111	3240.00	3229.10	3160.50	1136.00	1135.93	1138.16	2837	20.00	7.00	2857
112	3260.00	3249.10	3180.50	1141.00	1140.93	1143.16	2842	20.00	5.00	4000
113	3280.00	3269.10	3200.50	1146.00	1145.93	1148.16	2847	20.00	5.00	3999
114	3300.00	3289.10	3220.50	1151.00	1150.93	1153.16	2852	20.00	5.00	4000
115	3312.50	3301.60	3233.00	1154.00	1153.93	1156.16	2856	12.50	3.00	4166