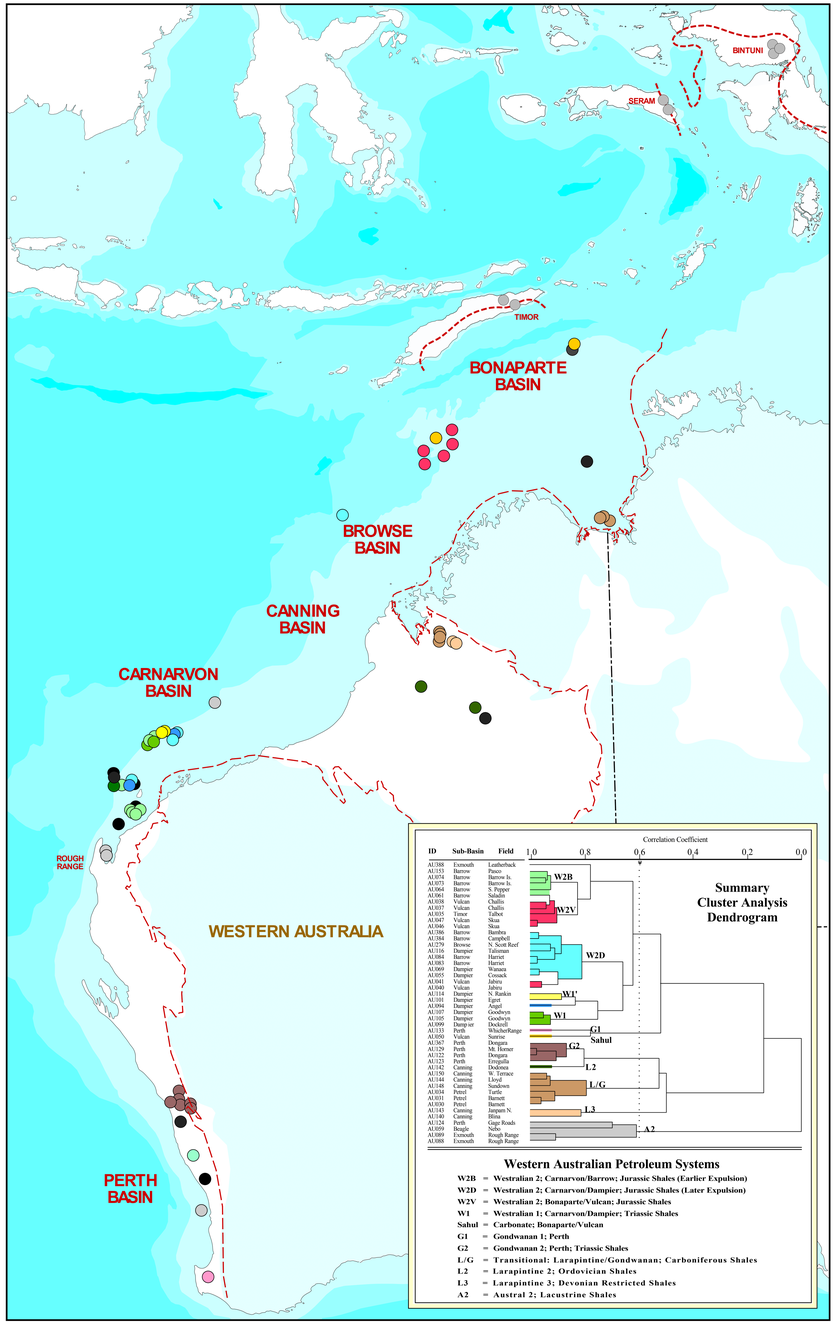
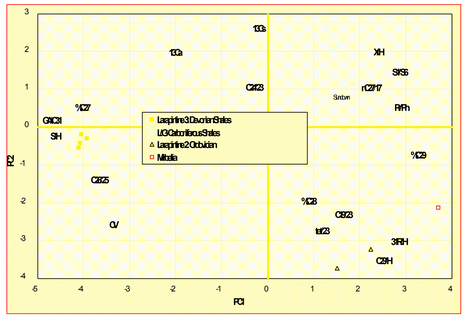


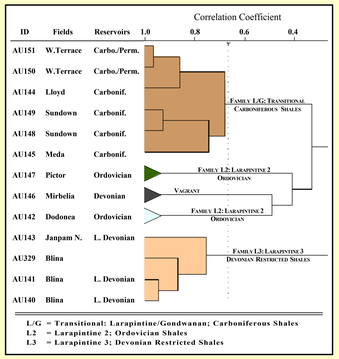
Summary Table

Field/Well	Depth (m)	PC 1	PC 2	PC 3	13Cs	13Ca	S1/S6	Ts/Tm	29D/H
Family L3									
AU143 Janpam N.	1662	-4.10	-0.55	0.40	-29.23	-26.81	0.53	1.13	0.52
AU140 Blina	1489	-4.05	-0.18	0.64	-29.21	-27.24	0.99	1.16	0.41
AU141 Blina	1472	-3.94	-0.30	0.56	-29.18	-27.16	0.99	1.21	0.39
AU329 Blina	1813	-4.07	-0.42	-0.02	-29.26	-27.26	0.87	1.23	0.38
Family L/G									
AU145 Meda	1564	1.02	1.50	-0.99	-27.31	-27.20	2.95	2.28	0.65
AU150 W. Terrace	1159	1.37	2.07	0.19	-27.91	-27.77	3.60	3.17	0.85
AU149 Sundown	1480	1.86	1.13	-1.13	-28.82	-28.33	3.95	3.18	0.87
AU148 Sundown	1098	1.66	1.04	-1.29	-28.81	-28.32	3.66	3.19	0.86
AU151 W. Terrace	1198	1.50	2.14	0.23	-27.86	-27.77	3.82	3.26	0.81
AU144 Lloyd	1523	1.30	2.66	0.36	-27.05	-27.17	3.65	3.65	0.95
Family L2									
AU142 Dodonea	1554	1.51	-3.74	-2.93	-31.48	-31.75	1.70	0.62	0.23
AU147 Pictor	956	2.24	-3.23	-0.21	-31.10	-29.93	2.42	0.63	0.17
Vagrant									
AU146 Mirbelia	1847	3.70	-2.13	4.17	-30.21	-29.40	2.34	1.20	0.48

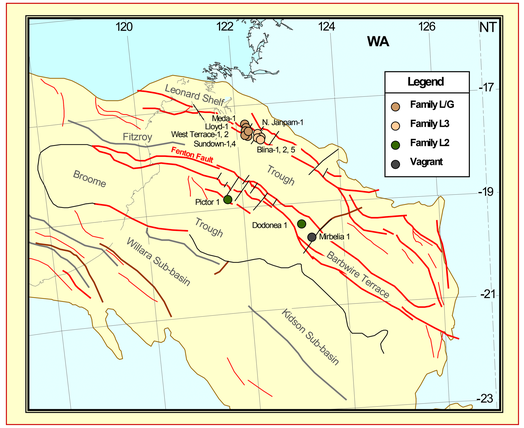
Principal Component Scores and Loads



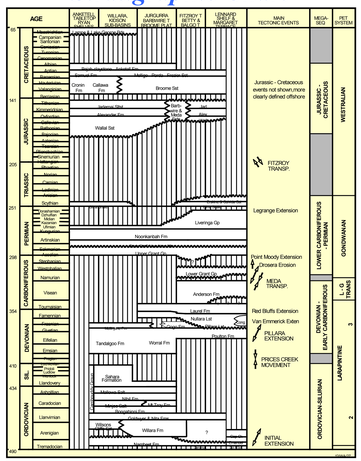
Cluster Analysis Dendrogram



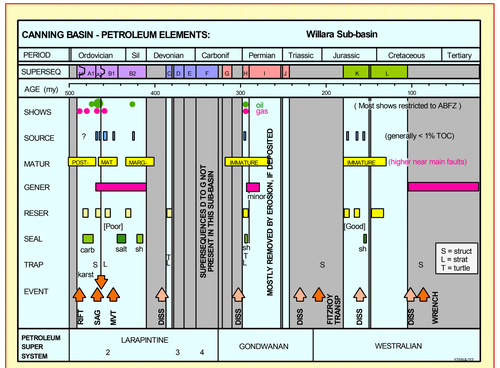
Oil Family Distribution



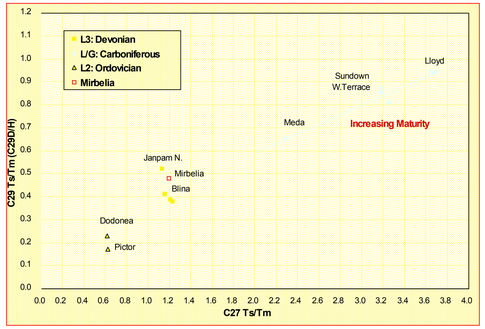
Stratigraphic Chart



Event Chart



Terpane Thermal Maturity



Abstract

Three Canning Basin oil families are evident in the cluster analysis **Dendrogram.** Dodonea-1 and, to a lesser extent Pictor-1, show GC patterns in accord with Ordovician oils sourced world-wide by *G. prisca*. It is also likely that the Dodonea-1 oil is reservoired near to, or within its source horizon in the Goldwyer. Accordingly, the family is assigned as Larapintine 2 (L2). The Devonian reservoired Blina and Janpam North fields from the Lennard Shelf are characterized by high gammacerane content, steranes/hopanes, and % C27 regular steranes (**Principal Component Analysis**). The high gammacerane and low Pr/Ph values reflect deposition of source sediments in a rather restricted or stratified water column, perhaps caused by salinity gradients. The source is interpreted to be a calcareous shale facies of the Larapintine 3 (L3) petroleum system (Devonian Gogo Formation and time equivalents). Devonian Mirbelia oil appears to be a vagrant, not easily typed with the other Canning Basin oils, and may represent yet another source rock facies. The third family comprising Meda, Lloyd, West Terrace and Sundown oils were probably sourced from Early Carboniferous shales and show excellent internal correlation and correlate well with the Transitional L/G oils of the Petrel Sub-basin but have not suffered paleobiodegradation. The occurrence of several distinctive terpane biomarkers in the oils from both basins support this idea. The two Carboniferous-reservoired Sundown oils of Family L/G have bulk hydrocarbon carbon isotope compositions of about 1 ä lighter than the other oil family members (**Summary Table**). It is likely that these oils contain another source component, derived from the Ordovician. PC2 values for Sundown oils are pulled toward the Ordovician L2 Family oils of Pictor and Dodonea suggesting mixing consistent with the biomarker distribution as well. In the **Terpane Thermal Maturity** plot for Canning oils is, Lloyd oil appears more mature than Meda with Sundown and West Terrace intermediate within the L/G Family. Although L3 and L2 Family members have lower Ts/Tm values than L/G oils, the different source horizons preclude inter family maturity comparisons using these terpane parameters. Geohistory analysis of onshore wells across the Canning Basin indicate that the Paleozoic source rocks attained peak maturity, generated and expelled the bulk of their hydrocarbons during major subsidence-sag phases in the Paleozoic and prior to the Fitzroy Transpression. Little or no generation has taken place since the Triassic. Seal integrity and the fact that significant structuring has taken place since peak generation times must be considered as a major exploration risks.

GeoMark Research, Inc.

AGSO Australian Geological Survey Organisation

Petroleum Systems of Western Australia

Canning Basin Montage

March 1996