Geological Survey of Canada Open File 5670

Vitrinite reflectance data for Petro Canada - Mobil Hesper I-52

M. P. Avery

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for
Petro Canada - Mobil Hesper I-52

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2008

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Well information

G.S.C. Locality No.: D162 **Unique Well ID:** 300 I52 44500 57450 **Location:** 44.69453° N, 57.87562° W

R.T. Elevation: 98.1 **Water Depth:** 138.12 **Total Depth:** 9200

Sampled Interval: 990 - 9200 **Interval Studied:** 1920-8970

Depth Units: Feet referenced to R.T. **Rig Release Date:** June 5, 1976

Introduction

Vitrinite reflectance has been determined on 6 rotary cutting samples from Petro Canada - Mobil Hesper I-52, which was classified as an exploratory well located in the Scotian Basin on the Scotian Shelf. The well status is Plugged and Abandoned.

Sample preparation followed the procedures listed in Appendix I. Data acquisition and manipulation was done on a Zeiss Photometer III system with a custom interface to a computer for data storage and statistical summaries.

Analysis of the well reveals thermal maturity levels given in Table I. Specific maturity levels, as set out in this report, are based on those of Powell and Snowdon(1983) with modified terminology (Appendix II).

Table I
Inferred Hydrocarbon Thermal Maturity Levels

Depth in feet	Vitrinite Reflectance* %Ro	Hydrocarbon generation levels** for type II or III kerogen
138 [sea floor]	(0.23)	immature
5730	0.4	immature approaching maturity
7900	0.50	marginally mature
9200[T.D.]	(0.57)	marginally mature

**( )'s indicate Ro's extrapolated from linear regression slope: 0.146 log Ro/km*
*** Actual hydrocarbon products depend on type of organic matter present (Powell and Snowdon, 1983).*

Remarks

Sample coverage for vitrinite reflectance analysis (Figure 1, Table II) was reasonably complete over the section penetrated between 1920 and 8970' at Hesper I-52. The data were plotted on a log Ro vs. linear depth scale. A regression line fitted through the data yielded a maturity slope of 0.1465 log Ro/km. Because there is a significant variation in the number of readings from one sample point to another (Table II) the regression line was weighted based on the 'n' value for each point . The relative size of the point symbols provide an indication of the number of readings. The 'error bars' displayed on the maturity profile indicate one standard deviation on either side of the mean and may be deceivingly small for samples with very few readings.

The histogram display (Figure 2) shows the variability in the reflectance populations, which represent the maturity of the sediments with depth. Plotting reflectance histograms on a log scale may help reveal any trends present in the Ro data. It also can help to demonstrate the effects of cavings, geology, casing points and other influences on the vitrinite reflectance populations.

These vitrinite reflectance data show that the thermal maturity of the lower section of Hesper I-52 is only marginally suitable to generate hydrocarbons within the drilled section, between 1920 and 8970' (T.D.), provided potential source rocks of the proper organic matter type and traps are present.

Method

Data obtained for this report were measured on polished kerogen mounts. Kerogen concentrate preparations make much more of the organic matter from the sample interval available for viewing by the operator than other methods. The lack of mineral matter makes for better polishing and since the polished surface is much reduced the analysis time is about a third or less of that for non-concentrate preparations.

References

Powell, T. G. and Snowdon, L. R.
1983: A composite hydrocarbon generation model. Erdöl und Kohle, Erdgas, Petrochemie, v. 36, p. 163-170.

c.c. P. Dennis, Director's Office, GSC (Atlantic)
H. Wielens, GSC (Atlantic)
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MResG Files, GSC (Atlantic)
K. Osadetz,, GSC (Calgary)
C. Beaumont, Dalhousie Univ., Halifax
D. Hawkins, C-NLOPB, St. John's (3 copies)

Table II

Summary of kerogen - based vitrinite reflectance

Sample Labels	Depth in feet	Mean Ro (SD) non-rotated	Number of Readings	
			Total	Edited
K0079A	1920	0.27 (±0.06)	16	16
K0079B	3630	0.28 (±0.03)	3	3
K0079C	3990	0.36 (±0.04)	15	12
K0080A	6270	0.40 (±0.05)	21	21
K0080B	6970	0.47 (±0.04)	22	20
K0080C	7270	0.48 (±0.05)	20	20
K0081A	7670	0.47 (±0.04)	15	15
K0081B	8570	0.52 (±0.06)	25	25
K0081C	8970	0.60 (±0.08)	13	12

Table III

Formation Tops (Moir, pers. comm.)

Formation	Top (Depth in feet)
Banquereau	in casing
Wyandot	4088
Dawson Canyon	4899
Petrel Mbr	5367-5390
Logan Canyon	5800
Marmora Mbr	5800-6206
Sable Mbr	6206-6580
Cree Mbr	6580-8756
Naskapi Mbr	8756-9033
(volcanic beds)	8946-9006
Missisauga	9033

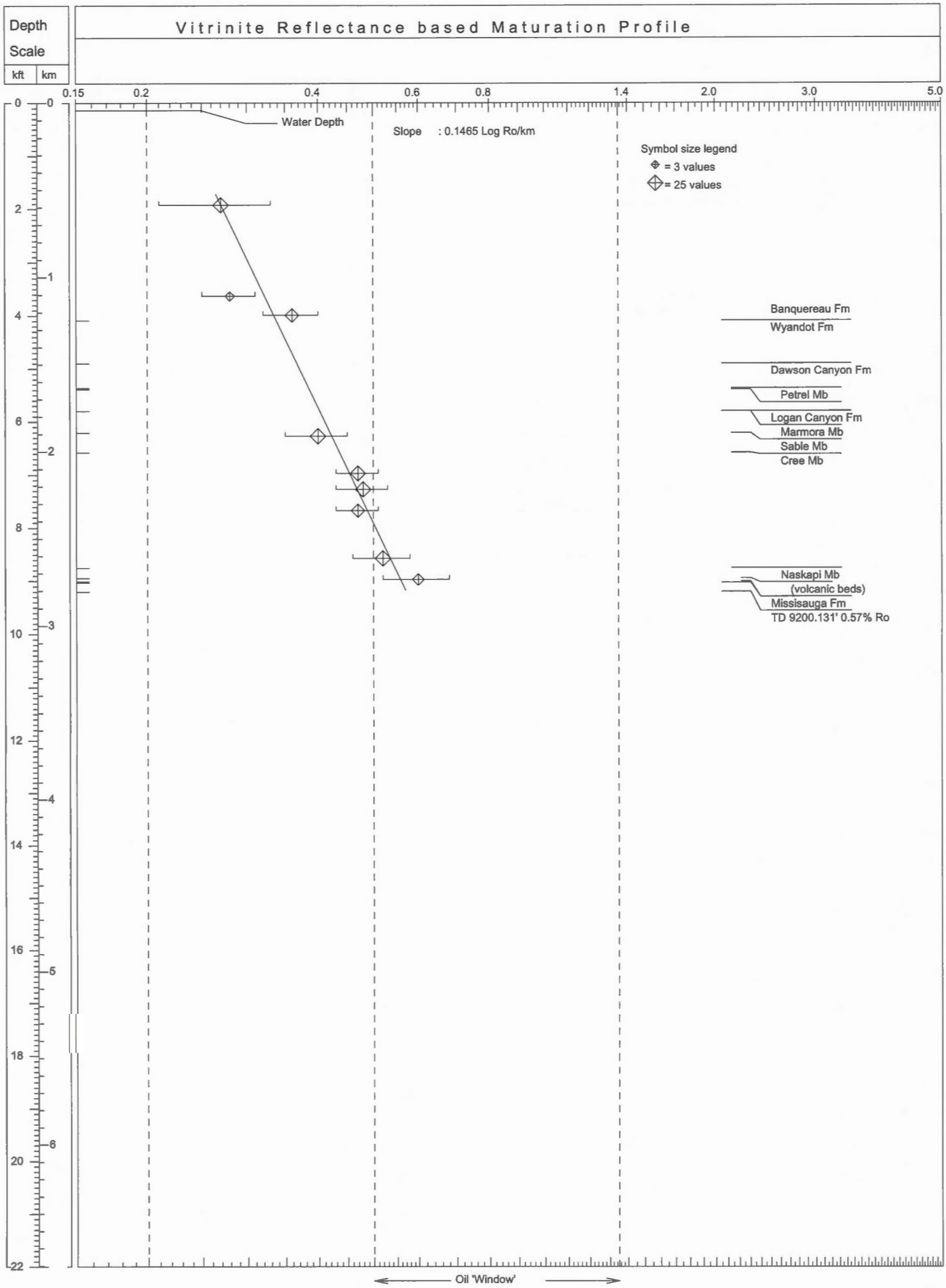


Figure 1. VR/depth plot for Hesper I-52

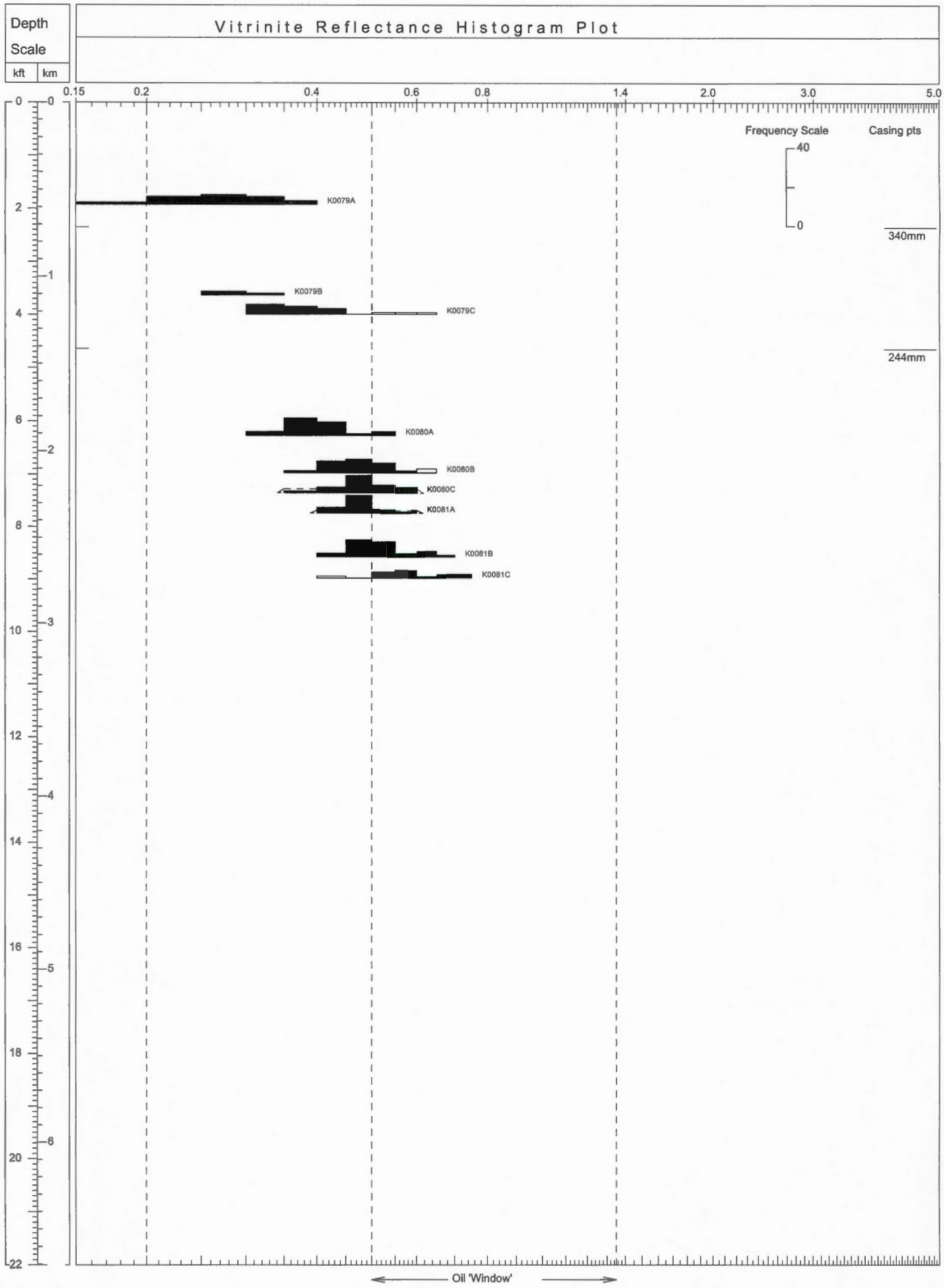
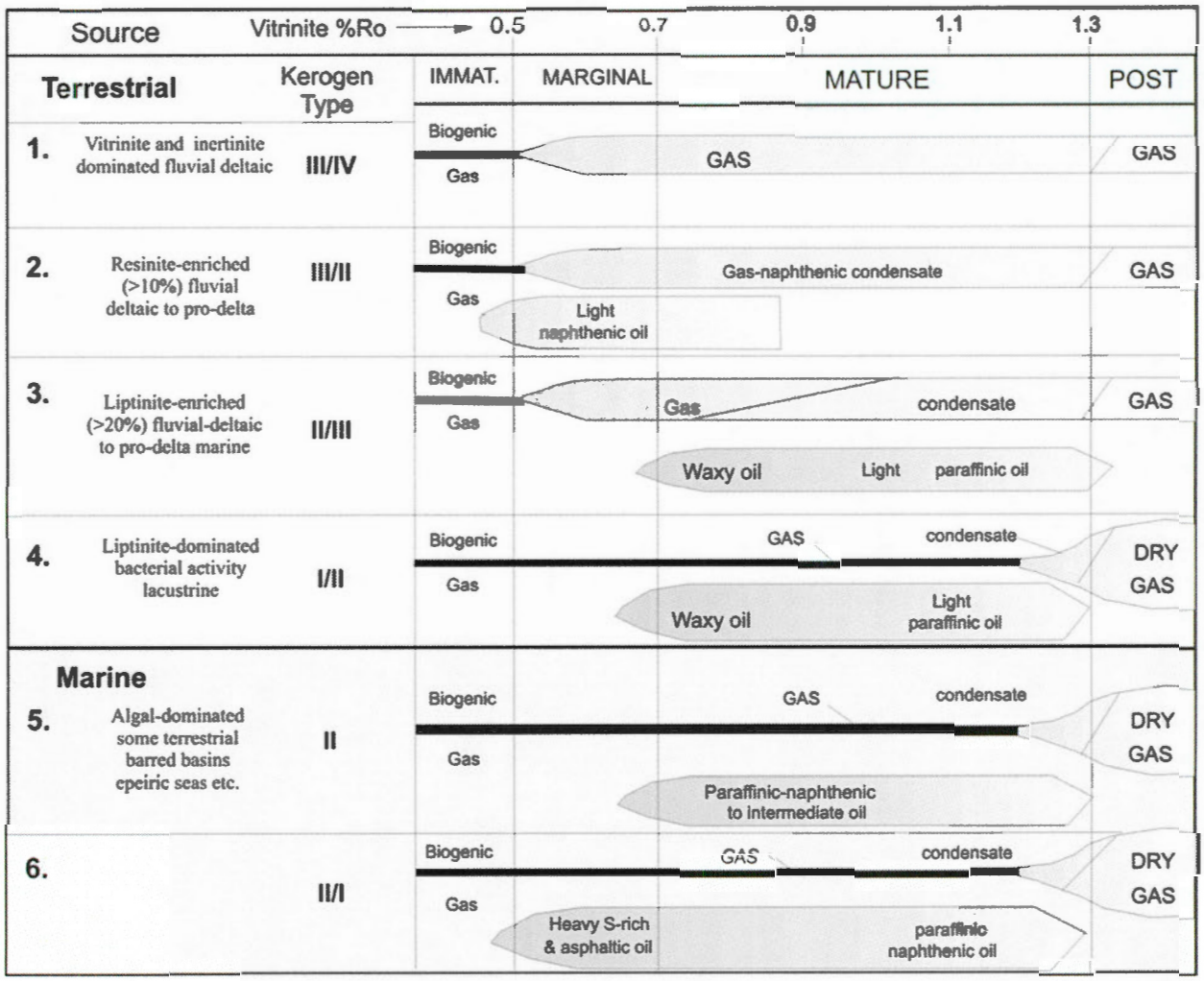


Figure 2. VR Histograms/depth plot for Hesper I-52

Appendix I (Powell and Snowdon 1983)



Hydrocarbon generation model compiled from Powell and Snowdon (1983) illustrating the different thresholds of hydrocarbon generation and products as related to thermal maturity, kerogen type and paleodepositional environment.

Appendix II

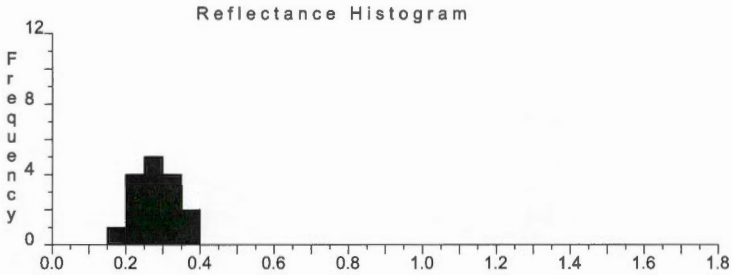
Data listings and basic statistics

Data listings and basic statistics for: Hesper I-52

K0079A

Col >	1	2	3	4	5	6	7	8	9	0
Row	(0.31)	(0.22)	(0.22)	(0.18)	(0.30)	(0.22)	(0.20)	(0.28)	(0.25)	(0.31)
1	(0.35)	(0.39)	(0.29)	(0.25)	(0.31)	(0.26)				

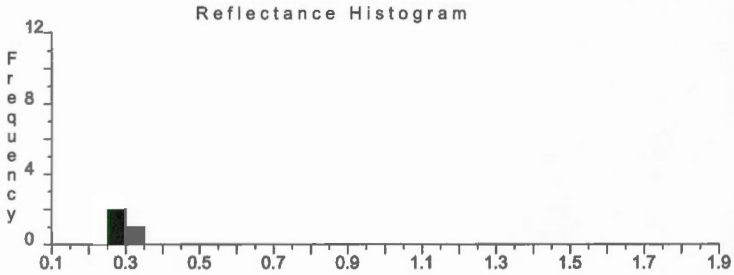
	Mean	Stand Dev	Pts	Min	Max	Sum
Total	0.27	0.06	16	0.18	0.39	4.34
(Edit)	0.27	0.06	16	0.18	0.39	4.34



K0079B

Col >	1	2
Row	(0.26)	(0.31) (0.27)

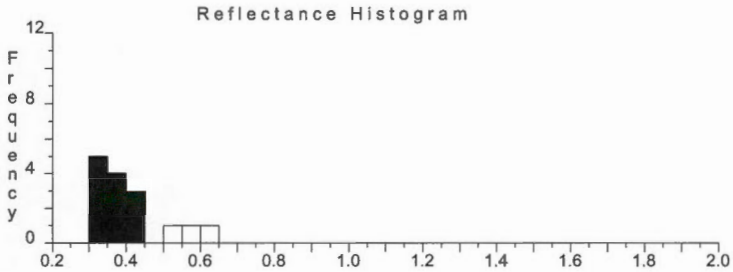
	Mean	Stand Dev	Pts	Min	Max	Sum
Total	0.28	0.03	3	0.26	0.31	0.84
(Edit)	0.28	0.03	3	0.26	0.31	0.84



K0079C

Col >	1	2	3	4	5	6	7	8	9	0
Row	(0.38)	(0.43)	(0.38)	(0.31)	0.54	(0.31)	0.57	(0.43)	(0.33)	0.64
1	(0.34)	(0.37)	(0.40)	(0.36)	(0.30)					

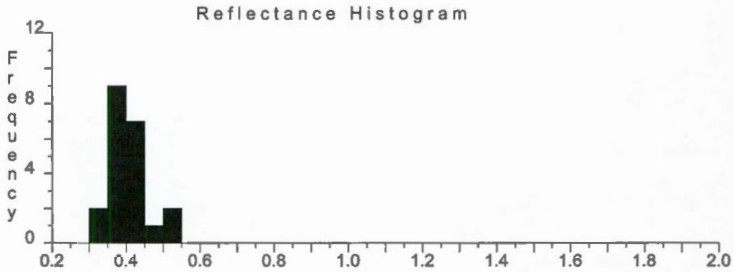
	Mean	Stand Dev	Pts	Min	Max	Sum
Total	0.41	0.10	15	0.30	0.64	6.09
(Edit)	0.36	0.04	12	0.30	0.43	4.34



K0080A

Col >	1	2	3	4	5	6	7	8	9	0
Row	(0.41)	(0.35)	(0.41)	(0.35)	(0.39)	(0.32)	(0.39)	(0.33)	(0.35)	(0.39)
1	(0.43)	(0.48)	(0.35)	(0.37)	(0.40)	(0.51)	(0.44)	(0.38)	(0.51)	(0.40)
2	(0.43)									

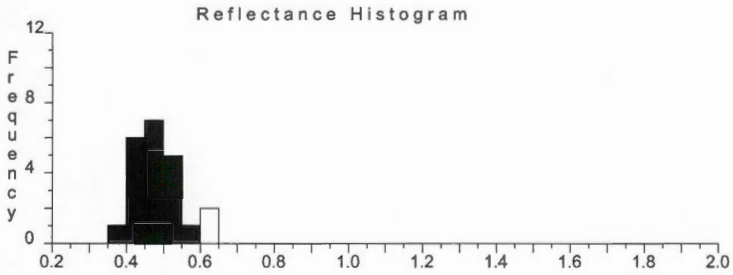
	Mean	Stand Dev	Pts	Min	Max	Sum
Total	0.40	0.05	21	0.32	0.51	8.39
(Edit)	0.40	0.05	21	0.32	0.51	8.39



K0080B

Col >	1	2	3	4	5	6	7	8	9	0
Row	(0.42)	(0.48)	(0.39)	(0.46)	(0.50)	(0.53)	(0.48)	0.61	(0.43)	(0.49)
1	(0.44)	(0.43)	(0.54)	(0.52)	0.62	(0.50)	(0.47)	(0.43)	(0.43)	(0.56)
2	(0.47)	(0.48)								

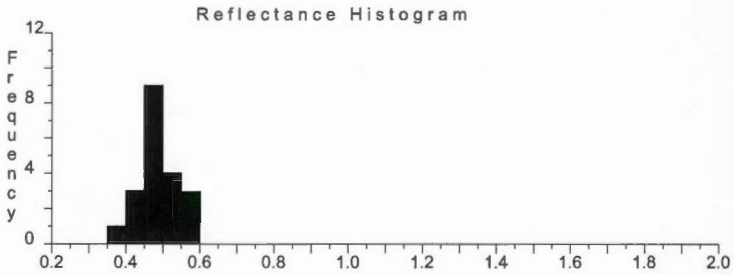
	Mean	Stand Dev	Pts	Min	Max	Sum
Total	0.49	0.06	22	0.39	0.62	10.68
(Edit)	0.47	0.04	20	0.39	0.56	9.45



K0080C

Col >	1	2	3	4	5	6	7	8	9	0
Row	(0.54)	(0.45)	(0.55)	(0.38)	(0.47)	(0.51)	(0.53)	(0.45)	(0.58)	(0.51)
1	(0.45)	(0.55)	(0.45)	(0.47)	(0.47)	(0.46)	(0.48)	(0.44)	(0.41)	(0.43)

	Mean	Stand Dev	Pts	Min	Max	Sum
Total	0.48	0.05	20	0.38	0.58	9.58
(Edit)	0.48	0.05	20	0.38	0.58	9.58

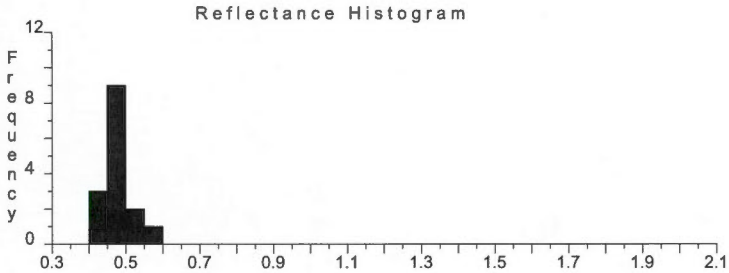


Data listings and basic statistics for: Hesper I-52

K0081A

Col >	1	2	3	4	5	6	7	8	9	0
Row	(0.41)	(0.51)	(0.47)	(0.47)	(0.47)	(0.59)	(0.46)	(0.43)	(0.52)	(0.47)
1	(0.45)	(0.44)	(0.46)	(0.45)	(0.46)					

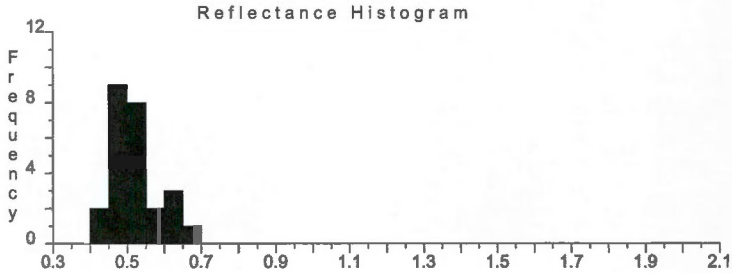
	Mean	Stand Dev	Pts	Min	Max	Sum
Total	0.47	0.04	15	0.41	0.59	7.06
(Edit)	0.47	0.04	15	0.41	0.59	7.06



K0081B

Col >	1	2	3	4	5	6	7	8	9	0
Row	(0.61)	(0.53)	(0.45)	(0.49)	(0.43)	(0.51)	(0.48)	(0.46)	(0.49)	(0.52)
1	(0.49)	(0.53)	(0.51)	(0.66)	(0.61)	(0.51)	(0.47)	(0.50)	(0.44)	(0.58)
2	(0.60)	(0.47)	(0.54)	(0.56)	(0.48)					

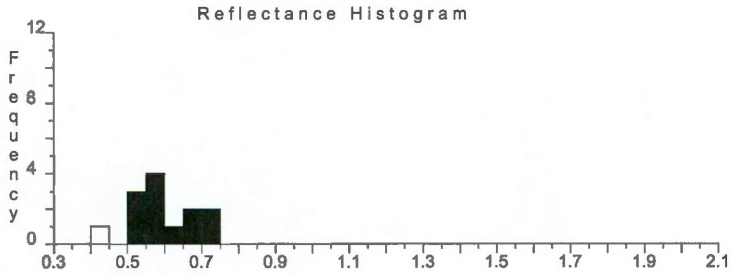
	Mean	Stand Dev	Pts	Min	Max	Sum
Total	0.52	0.06	25	0.43	0.66	12.92
(Edit)	0.52	0.06	25	0.43	0.66	12.92



K0081C

Col >	1	2	3	4	5	6	7	8	9	0
Row	(0.74)	(0.68)	(0.51)	(0.56)	(0.55)	(0.72)	0.44	(0.52)	(0.56)	(0.66)
1	(0.60)	(0.51)	(0.58)							

	Mean	Stand Dev	Pts	Min	Max	Sum
Total	0.59	0.09	13	0.44	0.74	7.63
(Edit)	0.60	0.08	12	0.51	0.74	7.19



2008 AGS Colloquium Budget

Income	Quantity	Unit cost	Total
Registration - Professional ($10 of $50 goes to AGS for membership)	120	$60.00	$7,200.00
Registration - Student ($5 of $15 to AGS for membership)	60	$20.00	$1,200.00
			$8,400.00

Expenses (including taxes)			
Holiday Inn room rentals (including McNab B for Saturday @ $150.00)			$2,850.00
Coffee breaks (1 Friday, 2 Saturday) incl 14% tax	3	$345.00	$1,179.90
Food for AGS birthday party (including 15% gratuity)			$1,710.86
AGS birthday cake		$50.00	$50.00
Equipment rental (three 6' X 8' screens, one Saturday only)	5	$155.00	$997.50
Poster boards	18	$70.00	$1,436.40
Table rentals (no charge)	no charge	$0.00	$0.00
Registration materials (name badges, etc.)			$100.00
Banquet speaker gift			$50.00
Mugs for volunteers	20	$15.00	$300.00
Bar tender fee (waived if sales exceed $300)	2	$72.00	$144.00
Membership fees back to AGS			$1,500.00
Internet connection for presentation rooms			$100.00
			$10,418.66

Sponsorship funds required to break even: $2,018.66