

Vitrinite reflectance data of cuttings from the following three wells:

Colorado Oil & Gas Yakutat No. 1, (1095' - 9295');
Colorado Oil & Gas Yakutat No. 2, (1980' - 11720'); and
Colorado Oil & Gas Yakutat No. 3, (6780' - 10730').

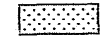
Received 27 September 1990

Total of 28 pages in report

Alaska Geologic Materials Center Data Report No. 174

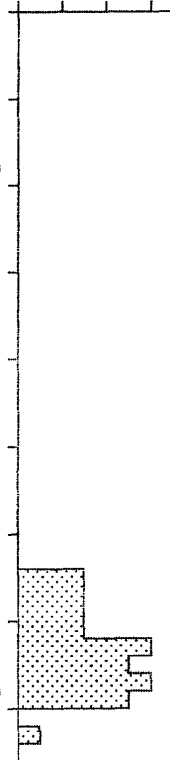
File Name: 90016037
 Channel Name: Point 8
 Description: 90016037 Yakutat #1 1,095-147 Alaska kerogen mjp VI 90

Min: 1.61
 Max: 2.07
 Mean: 1.83
 StDev: 0.12



00016037
 YAKUTAT #1 1,095
 SD: 0.12

Pt.	X-Pos	Y-Pos	Z-Pos	Meas1	Meas2	Ratio	Conc.
1				1.84			
2				1.82			
3			1.2	1.79			
4		+	0	1.61			
5				1.92			
6				1.79			
7				1.72			
8				1.96			
9				1.61			
10				1.91			
11				1.98			
12				1.99			
13				1.85			
14				1.69			
15				1.69			
16				1.69			
17				1.97			
18				1.90			
19				1.93			
20				1.86			
21				1.94			
22				1.81			
23				1.76			
24				1.72			
25				1.99			
26				1.86			
27				1.61			
28				1.81			
29				1.71			
30				1.84			
31				2.07			
32				1.90			
33				1.91			
34				1.82			
35				1.89			



I do not have confidence in the date for much of this well. The samples were poor & the organic mat'l sparse (?). Unless other, supporting, data exists, use with some caution. Mark

File Name: 90016038
 Channel Name: Point 8
 Description: 90016038 Yakutat #1 2,505- 605 Alaska kerogen mjp

Min: 1.07
 Max: 1.48
 Mean: 1.29
 StDev: 0.12

Pt.	X-Pos	Y-Pos	Z-Pos	Meas1	Meas2	Ratio	Conc.
1				1.33			
2				1.27			
3				1.32			
4				1.33			
5				1.48			
6				1.43			
7				1.28			
8				1.47			
9				1.07			
10				1.33			
11				1.09			
12				1.22			
13				1.25			
14				1.16			
15				1.28			



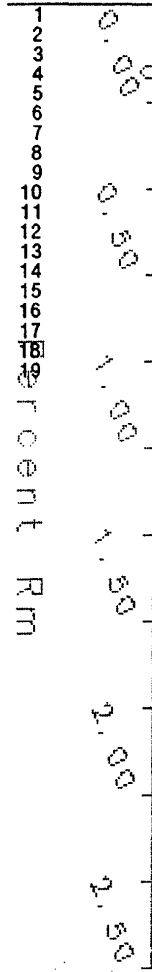
90016038
 N: 15
 Mean: 1.29
 SD: 0.12
 Yakutat #1 2,505

File Name: 90016039
 Channel Name: Point 8
 Description: 90016039 Yakutat #1 4,220- 350 Alaska kerogen mjp

Min: 1.57
 Max: 2.06
 Mean: 1.78
 StDev: 0.16

Pt. X-Pos Y-Pos Z-Pos Meas1 Meas2 Ratio Conc.

Pt.	X-Pos	Y-Pos	Z-Pos	Meas1	Meas2	Ratio	Conc.
1				1.85			
2				2.05			
3			1	1.85			
4		4	2	1.72			
5				1.64			
6				1.57			
7				2.06			
8				1.71			
9				1.72			
10				1.87			
11				1.77			
12				1.68			
13				2.01			
14				1.58			
15				1.85			
16				1.68			
17				1.93			
18				1.61			
19				1.63			

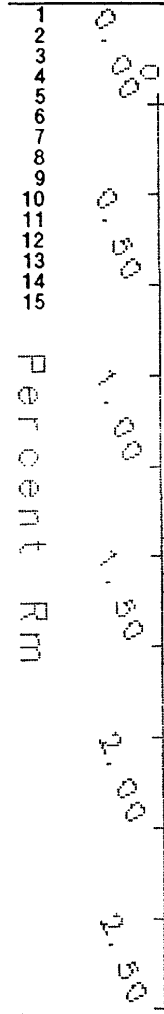


0016039
 n: 19
 YAKUTAT #1
 4,220
 SD: 0.16

File Name: 90016040
 Channel Name: Point 8
 Description: 90016040 Yakutat #1 5,280- 360 Alaska kerogen mjp

Min: 1.22
 Max: 1.53
 Mean: 1.36
 StDev: 0.11

Pt.	X-Pos	Y-Pos	Z-Pos	Meas1	Meas2	Ratio	Conc.
1				1.29			
2				1.53			
3				1.37			
4				1.22			
5				1.42			
6				1.49			
7				1.43			
8				1.38			
9				1.27			
10				1.44			
11				1.22			
12				1.25			
13				1.42			
14				1.25			
15				1.47			



90016040
 Min: 1.22
 Max: 1.53
 Mean: 1.36
 SD: 0.11
 Ratio: 1.36
 Conc.: 5,280

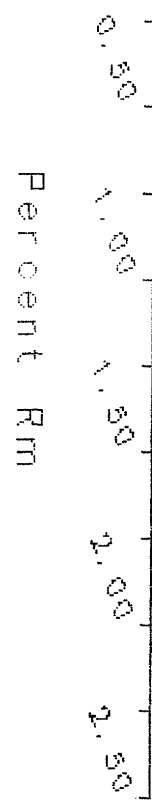
File Name: 90016041
 Channel Name: Point 8
 Description: 90016041 Yakutat #1 6,480- 640 Alaska kerogen mjp

Min: 1.37
 Max: 1.68
 Mean: 1.55
 StDev: 0.13

90016041
 YAKUTAT #1 6,480
 SD: 0.13

Pt.	X-Pos	Y-Pos	Z-Pos	Meas1	Meas2	Ratio	Conc.
-----	-------	-------	-------	-------	-------	-------	-------

1				1.67			
2				1.45			
3			12	1.68			
4	4	0	10	1.46			
5				1.57			
6				1.68			
7							
8				1.37			

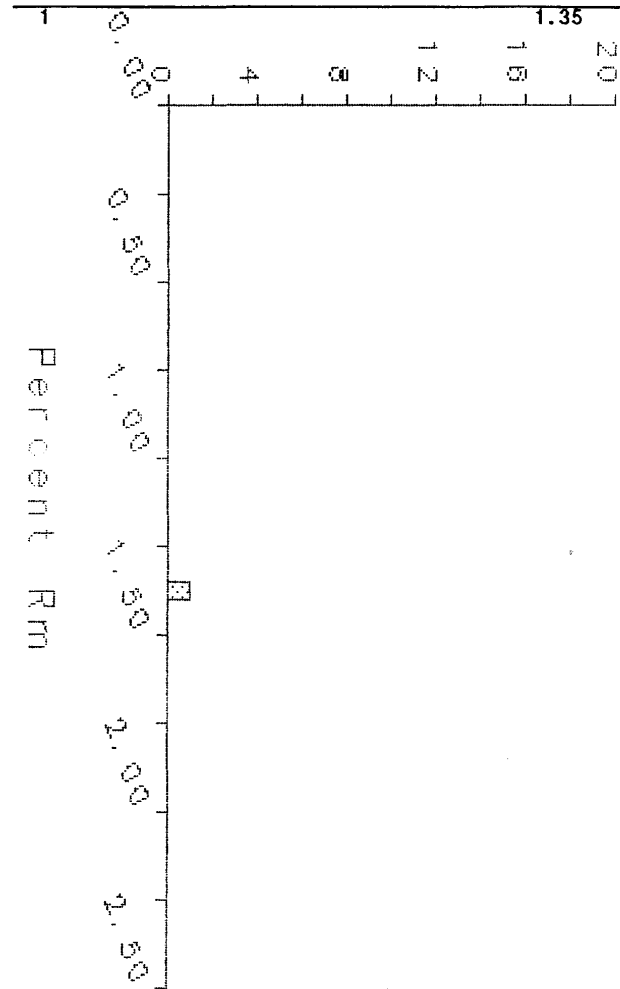


File Name: 90016044
 Channel Name: Point 8
 Description: 90016044 Yakutat #1 8,515- 575 Alaska kerogen mjp VTI90

Min: 1.35
 Max: 1.35
 Mean: 1.35
 StDev: 0.00

0016044
 n: 4
 Ratio 1.35
 SD: 0.00
 #1 8,515

Pt.	X-Pos	Y-Pos	Z-Pos	Meas1	Meas2	Ratio	Conc.
-----	-------	-------	-------	-------	-------	-------	-------

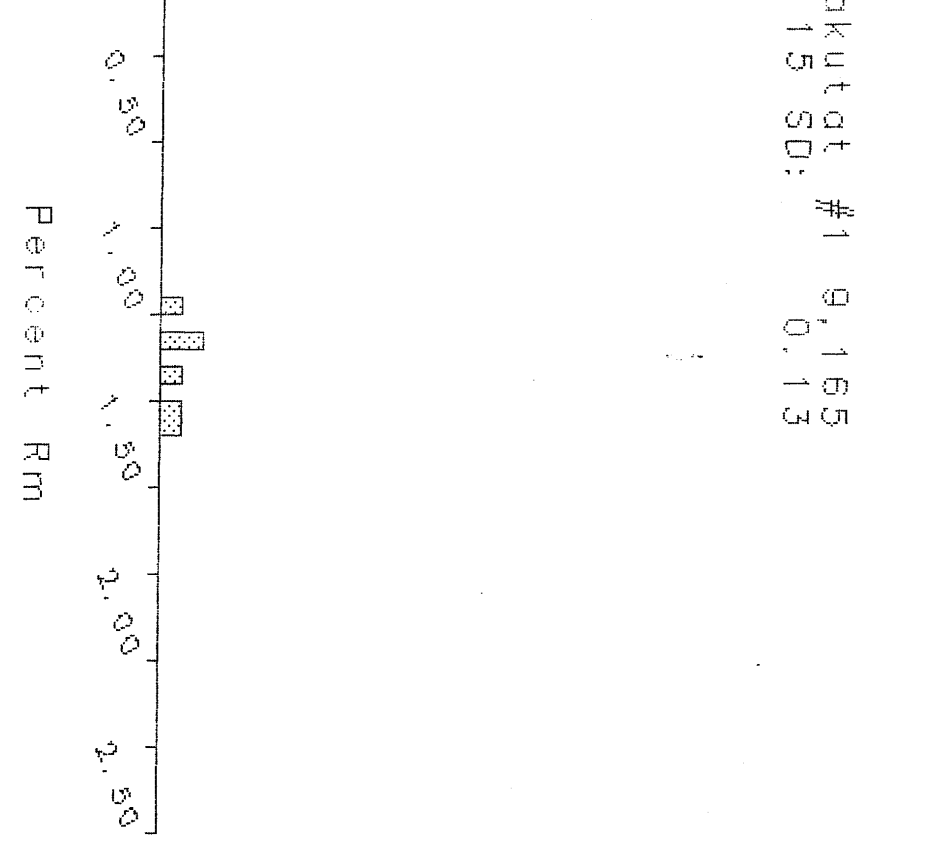


File Name: 900160⁴⁵
 Channel Name: Point 8
 Description: 900160⁴⁵ Yakutat #1 9,165-295 Alaska kerogen mjp VI 90

Min: 0.98
 Max: 1.32
 Mean: 1.15
 StDev: 0.13

Pt.	X-Pos	Y-Pos	Z-Pos	Meas1	Meas2	Ratio	Conc.
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1	0.00			1.28			
2				1.08			
3			1.2	1.16			
4	0.00	4	00	1.07			
5				0.98			
6				1.32			



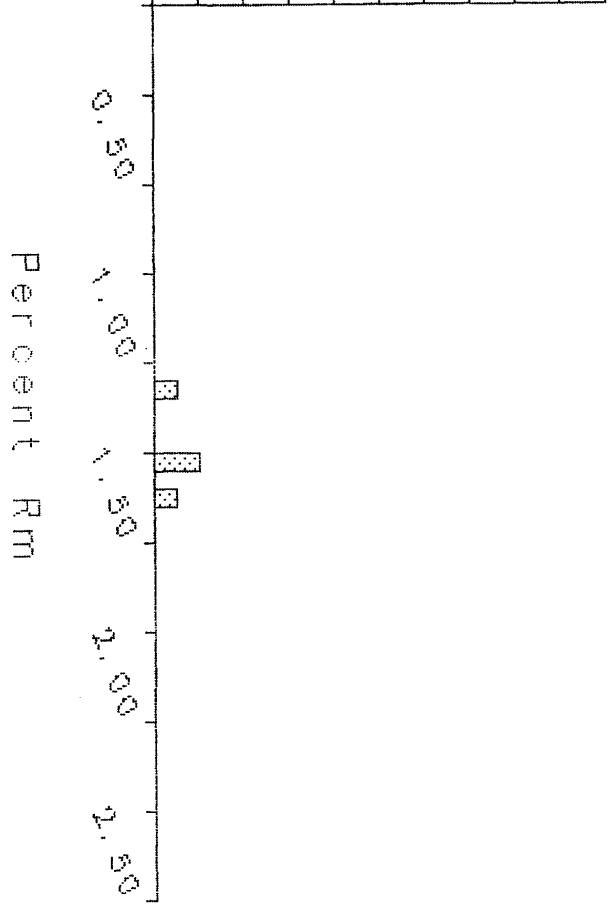
File Name: 90016063
 Channel Name: Point 8
 Description: 90016063 Yakutat #3 6,780- 930 Alaska kerogen mjb-V1190

Min: 1.08
 Max: 1.37
 Mean: 1.24
 StDev: 0.12



90016063
 YAKUTAT #3 6,780
 SD: 0.12

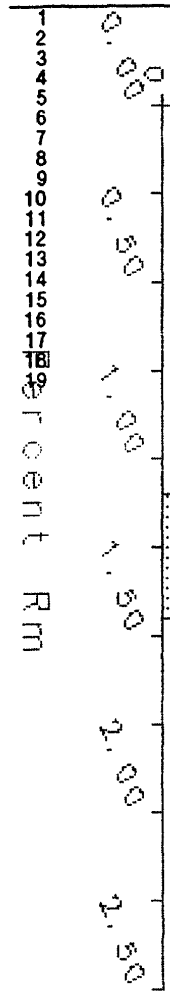
Pt.	X-Pos	Y-Pos	Z-Pos	Meas1	Meas2	Ratio	Conc.
1				1.08			
2				1.26			
3				1.25			
4				1.37			



File Name: 90016064
 Channel Name: Point 8
 Description: 90016064 Yakutat #3 7,590- 800 Alaska kerogen mjp

Min: 1.10
 Max: 1.43
 Mean: 1.27
 StDev: 0.11

Pt.	X-Pos	Y-Pos	Z-Pos	Meas1	Meas2	Ratio	Conc.
1				1.34			
2				1.14			
3				1.12			
4		4	12	1.10			
5				1.43			
6				1.42			
7				1.37			
8				1.38			
9				1.23			
10				1.18			
11				1.26			
12				1.28			
13				1.14			
14				1.13			
15				1.38			
16				1.33			
17				1.17			
18				1.32			
19				1.36			

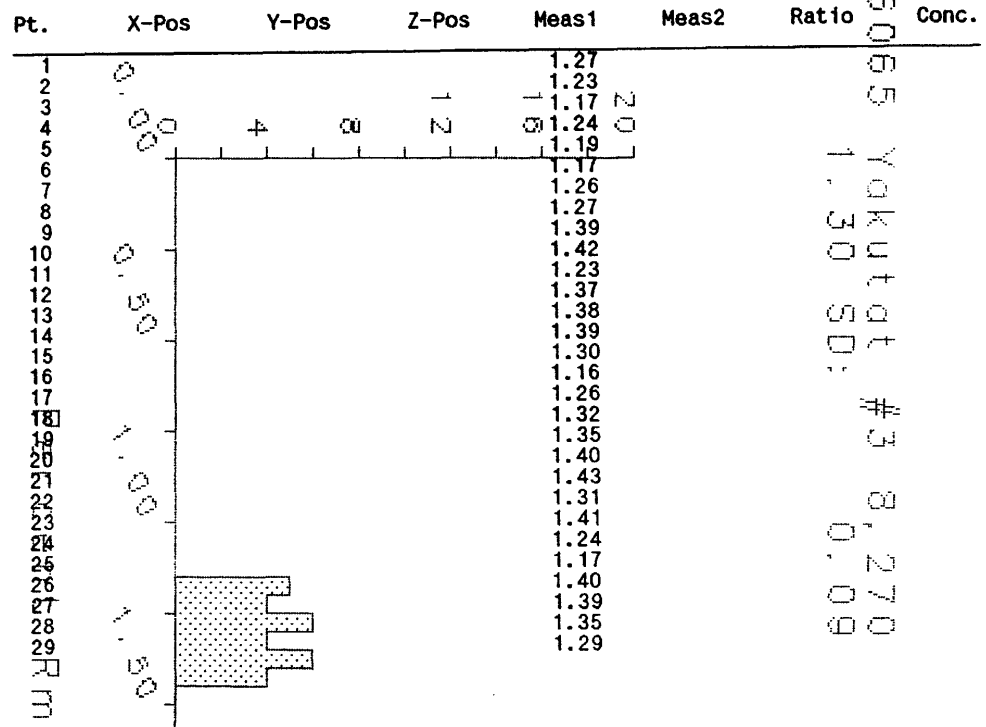


0016064
 1.27 SD: 0.11
 #3 7,590

File Name: 90016065
 Channel Name: Point 8
 Description: 90016065 Yakutat #3 8,270 450 Alaska kerogen mjp

Min: 1.16
 Max: 1.43
 Mean: 1.30
 StDev: 0.09

90016065
 YAKUTAT #3 8,270
 SD: 0.09

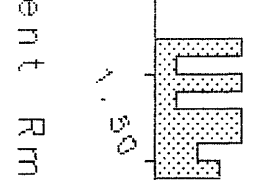


File Name: 90016066
 Channel Name: Point 8
 Description: 90016066 Yakutat #3 8,900- 9,050 Alaska kerogen mjt

Min: 1.17
 Max: 1.54
 Mean: 1.35
 StDev: 0.12

Pt. X-Pos Y-Pos Z-Pos Meas1 Meas2 Ratio Conc.

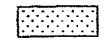
Pt.	X-Pos	Y-Pos	Z-Pos	Meas1	Meas2	Ratio	Conc.
1				1.17			
2				1.28			
3				1.30			
4				1.42			
5				1.47			
6				1.38			
7				1.39			
8				1.41			
9				1.28			
10				1.32			
11				1.29			
12				1.38			
13				1.20			
14				1.42			
15				1.52			
16				1.22			
17				1.51			
18				1.54			
19				1.49			
20				1.19			
21				1.40			
22				1.41			
23				1.17			



0016066
 1.35 SD: #3 8,900
 0.12

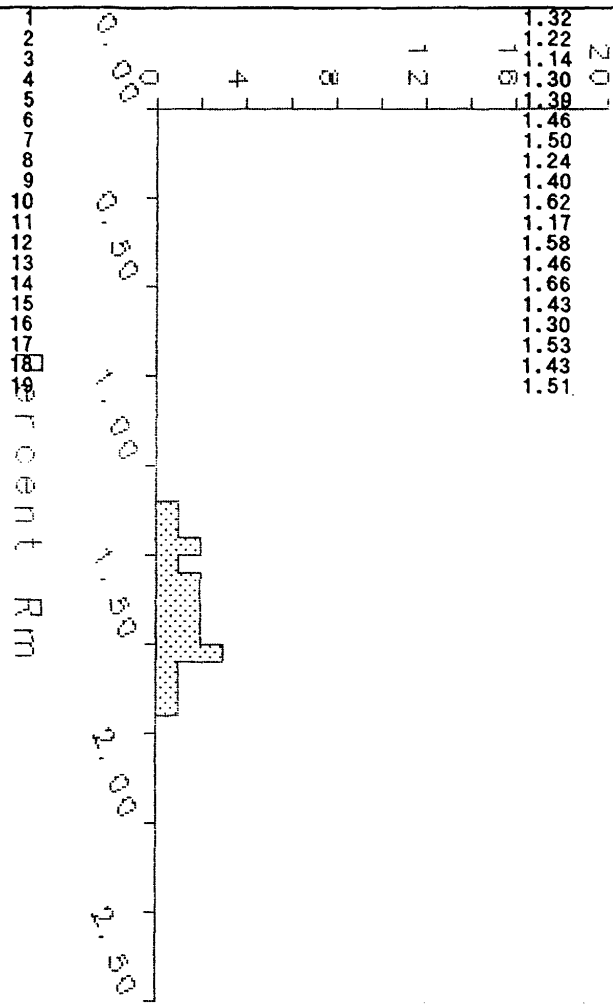
File Name: 90016067
 Channel Name: Point 8
 Description: 90016067 Yakutat #3 9,530 640 Alaska kerogen mjp

Min: 1.14
 Max: 1.66
 Mean: 1.40
 StDev: 0.15



0016067
 Yakutat #3 9,530
 1.40 SD: 0.15

Pt.	X-Pos	Y-Pos	Z-Pos	Meas1	Meas2	Ratio	Conc.
1				1.32			
2				1.22			
3			1.2	1.14			
4	4	00	1.2	1.30			
5				1.39			
6				1.46			
7				1.50			
8				1.24			
9				1.40			
10				1.62			
11				1.17			
12				1.58			
13				1.46			
14				1.66			
15				1.43			
16				1.30			
17				1.53			
18				1.43			
19				1.51			



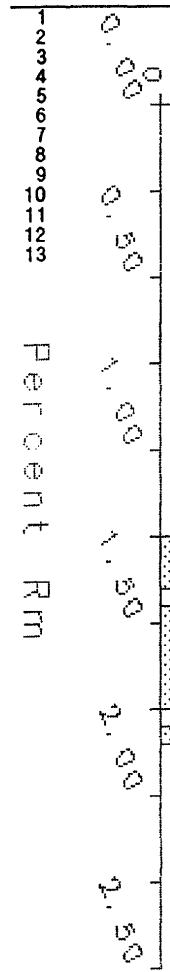
File Name: 90016068
 Channel Name: Point 8
 Description: 90016068 Yakutat #3 10,090- 220 Alaska kerogen mjs

Min: 1.28
 Max: 1.84
 Mean: 1.57
 StDev: 0.16



0016068
 1.57
 SD: 0.16
 #3 10,090

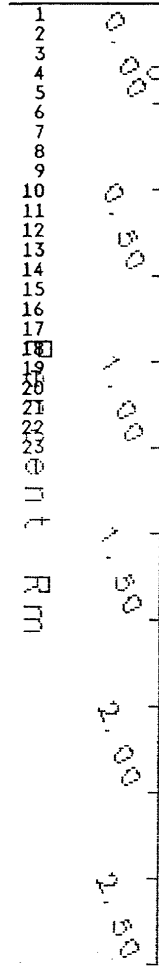
Pt.	X-Pos	Y-Pos	Z-Pos	Meas1	Meas2	Ratio	Conc.
1				1.50			
2				1.47			
3			1	1.28			
4		4	2	1.34			
5				1.56			
6				1.40			
7				1.63			
8				1.64			
9				1.73			
10				1.70			
11				1.84			
12				1.68			
13				1.60			



File Name: 90016069
 Channel Name: Point 8
 Description: 90016069 Yakutat #3 10,550-730 Alaska kerogen mjp

Min: 1.21
 Max: 1.59
 Mean: 1.39
 StDev: 0.10

Pt.	X-Pos	Y-Pos	Z-Pos	Meas1	Meas2	Ratio	Conc.
1				1.34			
2				1.44			
3			1.2	1.39			
4		4	0	1.33			
5				1.22			
6				1.21			
7				1.25			
8				1.46			
9				1.55			
10				1.29			
11				1.59			
12				1.36			
13				1.32			
14				1.56			
15				1.46			
16				1.45			
17				1.35			
18				1.32			
19				1.41			
20				1.45			
21				1.41			
22				1.50			
23				1.43			

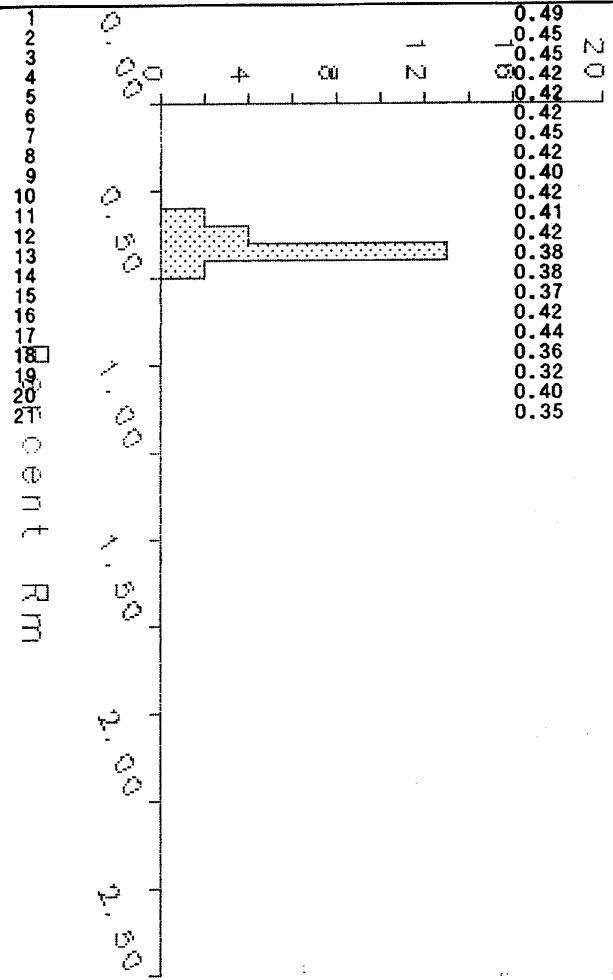


90016069
 Yakutat #3
 10,550
 SD: 0.10

File Name: 90016046
 Channel Name: Point 8
 Description: 90016046 Yakutat #2 1,980 2,210 Alaska kerogen mjb

Min: 0.32
 Max: 0.49
 Mean: 0.41
 StDev: 0.04

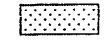
Pt.	X-Pos	Y-Pos	Z-Pos	Meas1	Meas2	Ratio	Conc.
1				0.49			
2				0.45			
3			12	0.45			
4		4	0	0.42			
5				0.42			
6				0.42			
7				0.45			
8				0.42			
9				0.40			
10				0.42			
11				0.41			
12				0.42			
13				0.38			
14				0.38			
15				0.37			
16				0.42			
17				0.44			
18				0.36			
19				0.32			
20				0.40			
21				0.35			



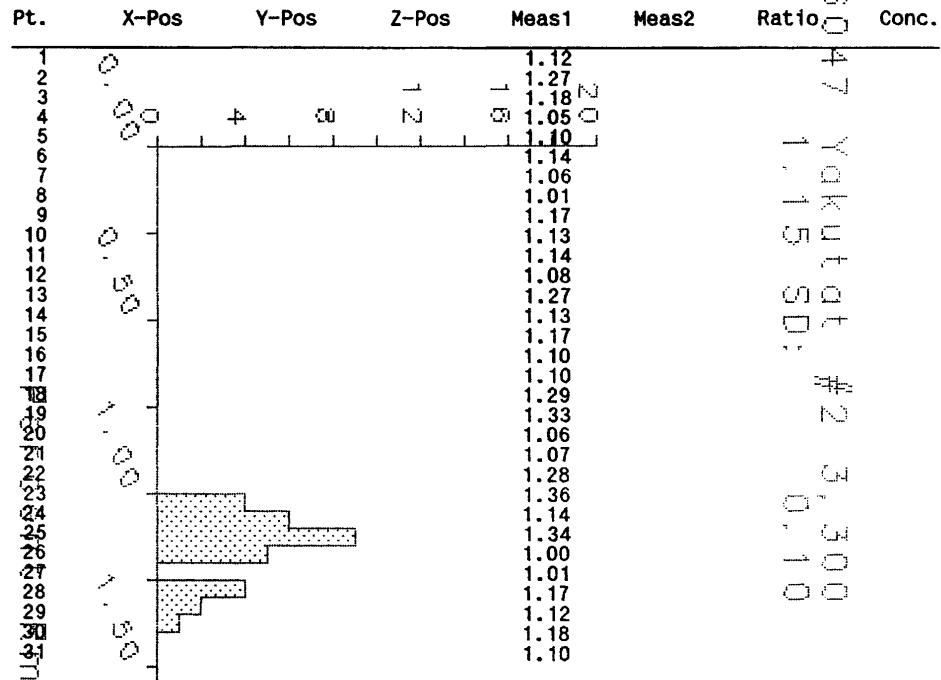
0016046
 YAKUTAT #2 1,980
 SD: 0.04

File Name: 90016047
 Channel Name: Point 8
 Description: 90016047 Yakutat #2 3,300- 390 Alaska kerogen mjp

Min: 1.00
 Max: 1.36
 Mean: 1.15
 StDev: 0.10



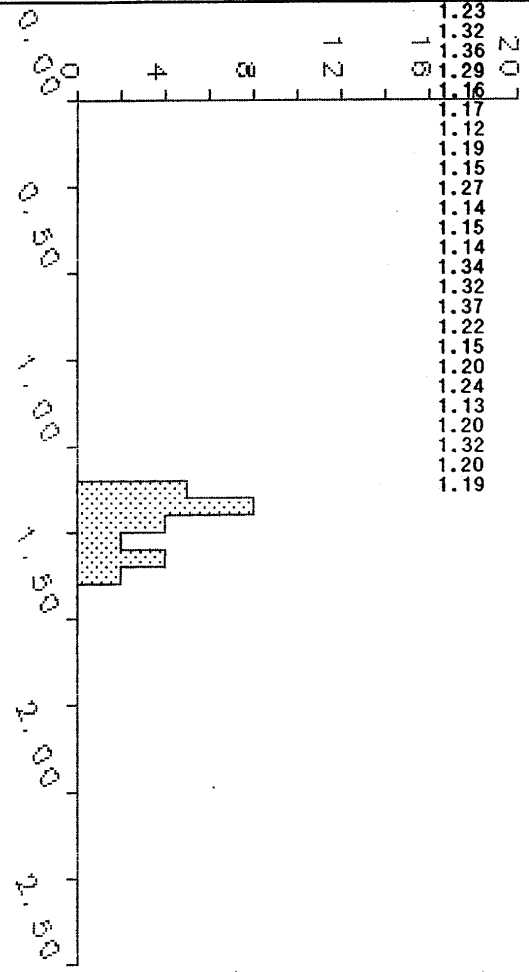
00016047
 1.15 SD: #2 3,300
 0.10



File Name: 90016048
 Channel Name: Point 8
 Description: 90016048 Yakutat #2 4,590-680 Alaska kerogen mjp VCI90

Min: 1.12
 Max: 1.37
 Mean: 1.22
 StDev: 0.08

Pt.	X-Pos	Y-Pos	Z-Pos	Meas1	Meas2	Ratio	Conc.
1				1.23			
2				1.32			
3				1.36			
4				1.29			
5				1.16			
6				1.17			
7				1.12			
8				1.19			
9				1.15			
10				1.27			
11				1.14			
12				1.15			
13				1.14			
14				1.34			
15				1.32			
16				1.37			
17				1.22			
18				1.15			
19				1.20			
20				1.24			
21				1.13			
22				1.20			
23				1.32			
24				1.20			
25				1.19			

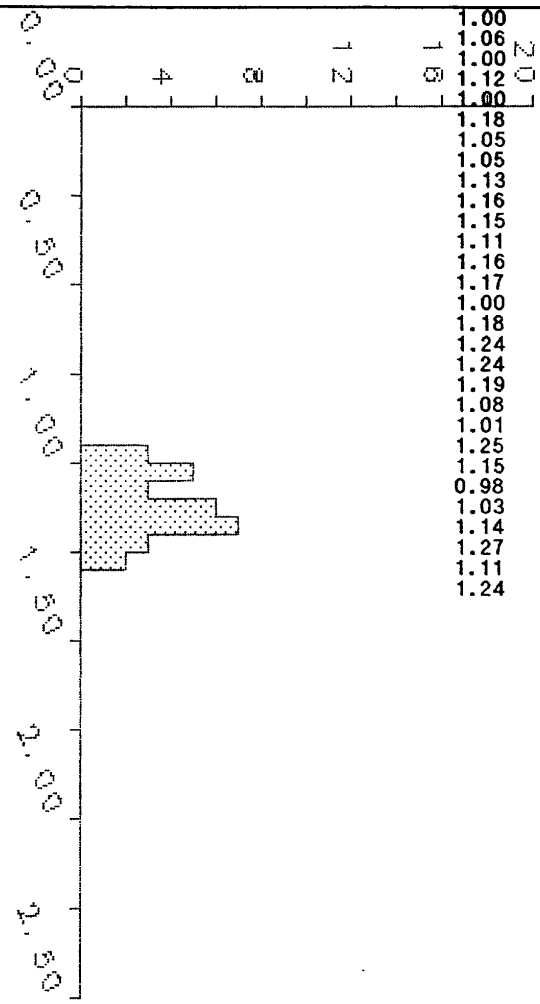


00016048
 1.22 SD: #2 4,590
 0.08

File Name: 90016049
 Channel Name: Point 8
 Description: 90016049 Yakutat #2 5,910- 6,030 Alaska ker mjb-VII90

Min: 0.98
 Max: 1.27
 Mean: 1.12
 StDev: 0.09

Pt.	X-Pos	Y-Pos	Z-Pos	Meas1	Meas2	Ratio	Conc.
1				1.00			
2				1.06			
3				1.00			
4		4	12	1.12			
5				1.00			
6				1.18			
7				1.05			
8				1.05			
9				1.13			
10				1.16			
11				1.15			
12				1.11			
13				1.16			
14				1.17			
15				1.00			
16				1.18			
17				1.24			
18				1.24			
19				1.19			
20				1.08			
21				1.01			
22				1.25			
23				1.15			
24				0.98			
25				1.03			
26				1.14			
27				1.27			
28				1.11			
29				1.24			



File Name: 90016050
 Channel Name: Point 8
 Description: 90016050

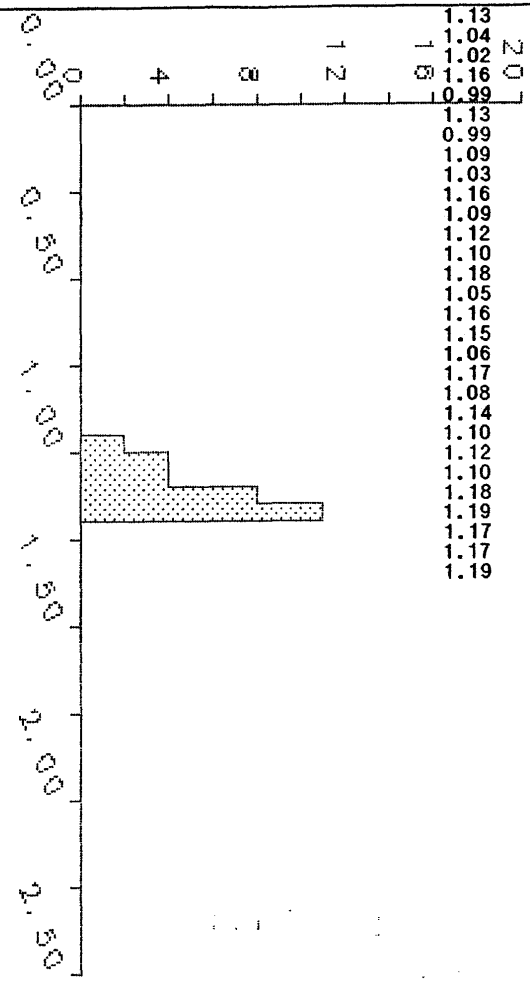
Frequency

Yakutat #2 7,110- 230 Alaska ker mjp

Min: 0.99
 Max: 1.19
 Mean: 1.11
 StDev: 0.06

0016050

Pt.	X-Pos	Y-Pos	Z-Pos	Meas1	Meas2	Ratio	Conc.
1				1.13			
2				1.04			
3				1.02			
4				1.16			
5				0.99			
6				1.13			
7				0.99			
8				1.09			
9				1.03			
10				1.16			
11				1.09			
12				1.12			
13				1.10			
14				1.18			
15				1.05			
16				1.16			
17				1.15			
18				1.06			
19				1.17			
20				1.08			
21				1.14			
22				1.10			
23				1.12			
24				1.10			
25				1.18			
26				1.19			
27				1.17			
28				1.17			
29				1.19			

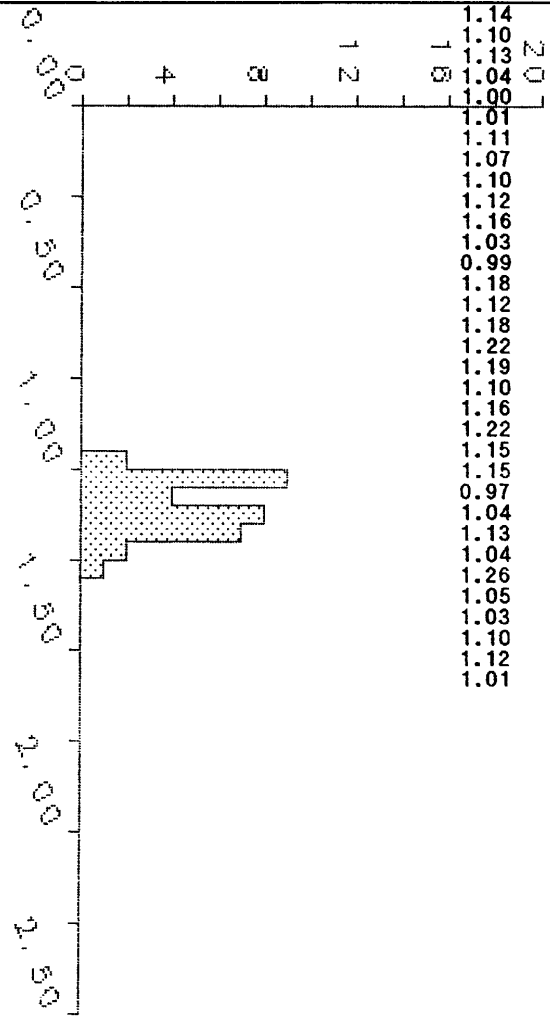


0016050
 1.11
 SD: 0.06
 Yakutat #2
 7.1

Min: 0.97
 Max: 1.26
 Mean: 1.10
 StDev: 0.07

0016051
 N: 33
 YAKUTAT #2
 SD: 0.07

Pt.	X-Pos	Y-Pos	Z-Pos	Meas1	Meas2	Ratio	Conc.
1				1.14			
2				1.10			
3			1	1.13			
4		4	2	1.04			
5	0.00			1.00			
6				1.01			
7				1.11			
8				1.07			
9				1.10			
10	0.50			1.12			
11				1.16			
12				1.03			
13				0.99			
14				1.18			
15				1.12			
16				1.18			
17				1.22			
18	1.00			1.19			
19				1.10			
20				1.16			
21				1.22			
22	1.00			1.15			
23				1.15			
24				0.97			
25				1.04			
26				1.13			
27	1.50			1.04			
28				1.26			
29				1.05			
30				1.03			
31				1.10			
32				1.12			
33	2.50			1.01			

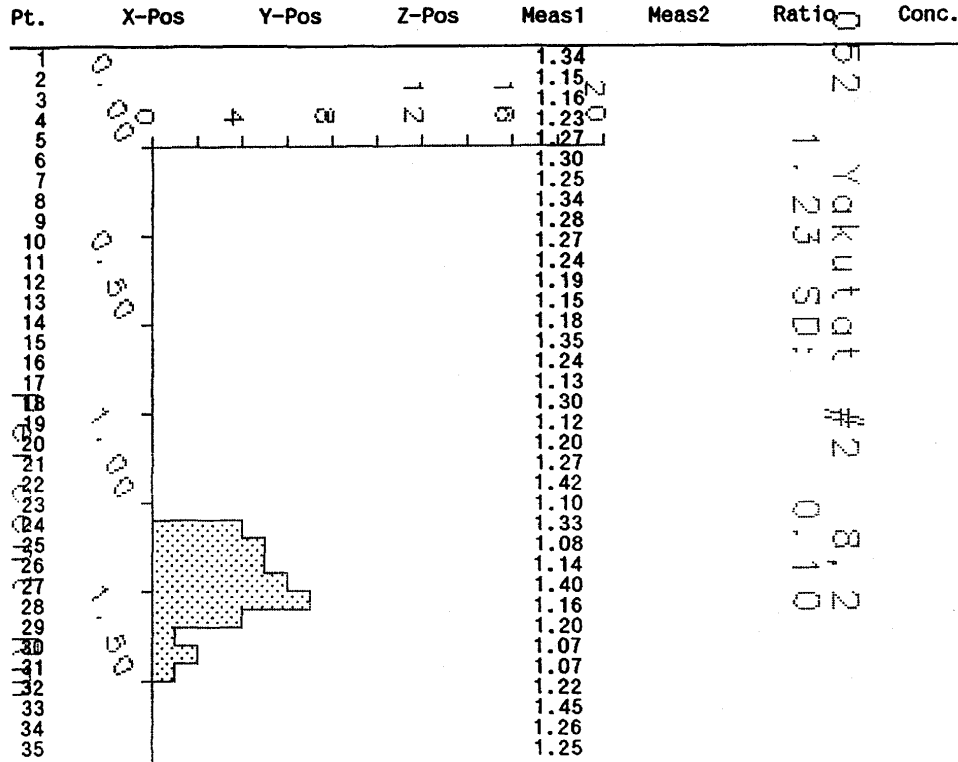


File Name: 90016052
 Channel Name: Point 8
 Description: 90016052 Yakutat #2 8,280- 370 Alaska ker mjp

Min: 1.07
 Max: 1.45
 Mean: 1.23
 StDev: 0.10



00016052
 N: 35
 Mean: 1.23
 SD: 0.10
 YAKUTAT #2



Min: 1.09
 Max: 1.56
 Mean: 1.29
 StDev: 0.13

Pt.	X-Pos	Y-Pos	Z-Pos	Meas1	Meas2	Ratio	Conc.
1				1.37			
2				1.32			
3			1	1.12			
4		4	2	1.26			
5				1.23			
6				1.27			
7				1.40			
8				1.32			
9				1.43			
10				1.17			
11				1.23			
12				1.24			
13				1.48			
14				1.14			
15				1.30			
16				1.09			
17				1.24			
18				1.15			
19				1.23			
20				1.14			
21				1.11			
22				1.28			
23				1.33			
24				1.27			
25				1.20			
26				1.15			
27				1.42			
28				1.23			
29				1.32			
30				1.56			
31				1.54			
32				1.35			
33				1.52			



90016053
 Min: 1.09
 Max: 1.56
 Mean: 1.29
 StDev: 0.13
 Yakutat #2
 SD: 0.13

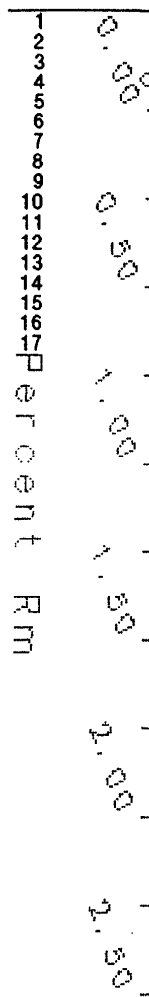
File Name: 90016054
 Channel Name: Point 8
 Description: 90016054 Yakutat #2 9,480- 600 Alaska ker mjp

Min: 1.08
 Max: 1.44
 Mean: 1.29
 StDev: 0.09



n: 17
 0016054
 1.29
 SD: 0.09
 #2
 9,4

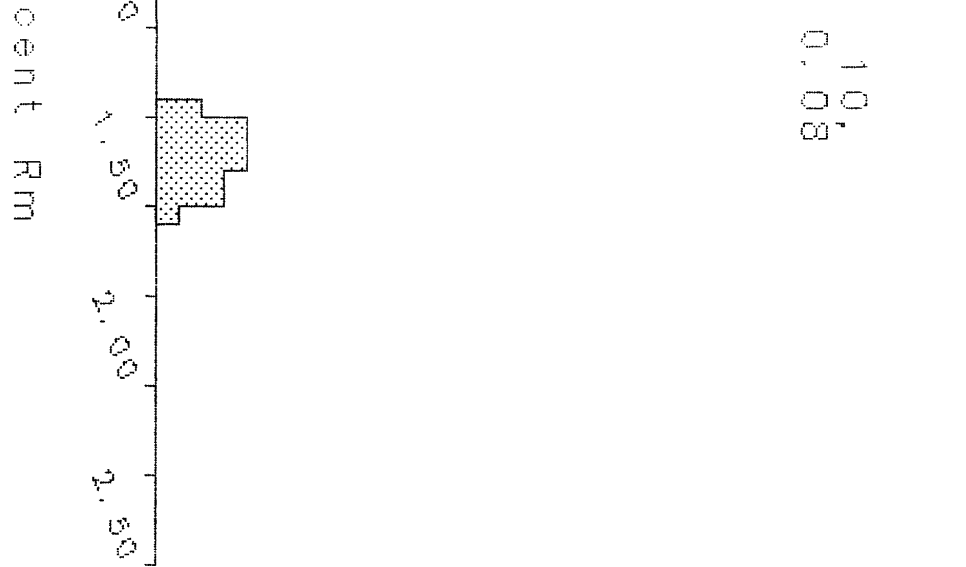
Pt.	X-Pos	Y-Pos	Z-Pos	Meas1	Meas2	Ratio	Conc.
1				1.38			
2				1.35			
3			1	1.22			
4		4	2	1.34			
5				1.41			
6				1.26			
7				1.37			
8				1.33			
9				1.30			
10				1.26			
11				1.35			
12				1.44			
13				1.19			
14				1.20			
15				1.20			
16				1.32			
17				1.08			



File Name: 90016055
 Channel Name: Point 8
 Description: 90016055 Yakutat #2 10,110- 230 Alaska ker mjp

Min: 1.23
 Max: 1.50
 Mean: 1.36
 StDev: 0.08

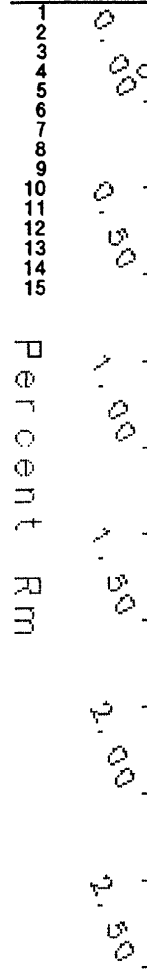
Pt.	X-Pos	Y-Pos	Z-Pos	Meas1	Meas2	Ratio	Conc.
1				1.41			
2				1.33			
3			12	1.37			
4	0.00	4	0	1.46			
5				1.25			
6				1.34			
7				1.50			
8				1.39			
9				1.41			
10				1.29			
11	0.50			1.38			
12				1.32			
13				1.28			
14				1.39			
15				1.31			
16				1.27			
17				1.23			
18				1.43			
19	1.00			1.49			
20				1.48			
21				1.29			



File Name: 90016056
 Channel Name: Point 8
 Description: 90016056 Yakutat #2 10,700- 790 Alaska ker mjs 71090

Min: 1.21
 Max: 1.55
 Mean: 1.40
 StDev: 0.10

Pt.	X-Pos	Y-Pos	Z-Pos	Meas1	Meas2	Ratio	Conc.
1				1.44			
2				1.44			
3				1.27			
4		4	12	1.50			
5				1.36			
6				1.55			
7				1.54			
8				1.39			
9				1.51			
10				1.36			
11				1.40			
12				1.34			
13				1.35			
14				1.21			
15				1.32			



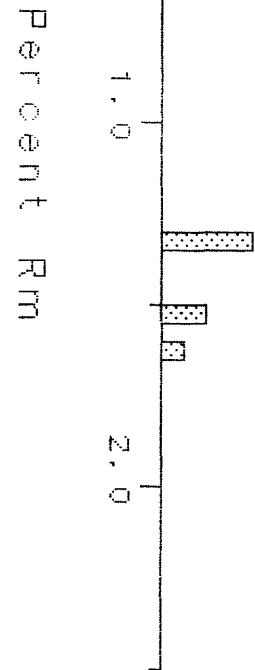
0016056
 1.40
 YAKUTAT #2
 10,
 SD: 0.10

File Name: 90016057
 Channel Name: Point 9
 Description: 90016057 Yakutat 2 11,120- 210 Alaska ker mjp VII90
 Comment 1:
 Comment 2:
 Comment 3:
 Comment 4:
 Comment 5:
 Comment 6:



	Meas1	Meas2	Ratio	Conc.
Min:	1.30	2.0		
Max:	1.60	2.0		
Mean:	1.42			
St.Dev:	0.13			

Pt.	X-Pos	Y-Pos	Z-Pos	Meas1	Meas2	Ratio	Conc.
1				1.52			
2				1.32			
3				1.31			
4				1.30			
5				1.54			
6				1.33			
7				1.60			



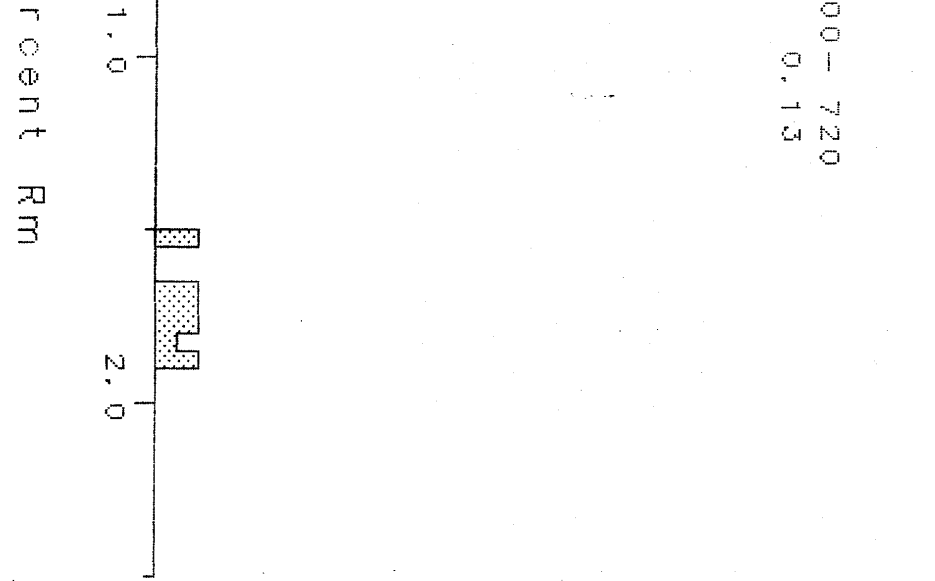
90016057
 09-9 MN
 YAKUTAT 2 11,120- 210
 1.42 SD 0.13

File Name: 90016058
 Channel Name: Point 9
 Description: 90016058 Yakutat 2 11,600- 720 Alaska ker mjp VII90
 Comment 1:
 Comment 2:
 Comment 3:
 Comment 4:
 Comment 5:
 Comment 6:

90016058
 CH9-9 MR

	Meas1	Meas2	Ratio	Conc.
Min:	1.50	2.0		
Max:	1.89			
Mean:	1.72			
StDev:	0.13			

Pt.	X-Pos	Y-Pos	Z-Pos	Meas1	Meas2	Ratio	Conc.
1				1.74			
2				1.81			
3				1.66			
4				1.68			
5				1.89			
6				1.80			
7				1.88			
8				1.78			
9				1.50			
10				1.71			
11				1.51			





United States Department of the Interior



GEOLOGICAL SURVEY
BOX 25046 M.S. 940
DENVER FEDERAL CENTER
DENVER, COLORADO 80225

IN REPLY REFER TO:

17 September, 1990

John Reeder
P.O. Box 772116
Eagle River, AK
99577-2116

John:

I am returning the prepared samples I borrowed from the state back in January. Enclosed, also, you will find data and histogram sheets for almost all the samples.

Some samples did have organic material I deemed good enough to measure. For the most part, the samples were good and the results are evident, at least individually. Taken on a well-by-well basis several were difficult to make good sense out of from an organic petrology point of view. The shape of the histograms is a good general indicator of consistency of the organics contained within and in the confidence I had while examining the samples. My technique was to measure at least 50 organic grains, while trying to stay within a narrow range. This becomes difficult with increased vitrinite reflectance, and the histogram spread increases. With adequate material and consistent rank (contamination from uphole cavings can introduce diverse groups of organics) the histogram will have some kind of a bell curve shape. Gaps in the histogram, relating to multiple populations of organics, are a problem and dilute the strength of the mean value as a good measure of the thermal maturity. These gaps are more common at the higher ranks, (> 1.5% reflectance), but occur at lower ranks when insufficient material exists or there is contamination in the sample. I admit to certain biases against samples prepared by people other than myself, and these samples were made by several different companies. I feel I lose too much control over the processing of the cuttings and do not have the confidence in other people's dedication to the work.

I hope these data can be of some use to you. If I can help by providing additional information, please let me know.

Thank you for providing the samples, and for your assistance while I was visiting.

Mark Pawlewicz

Mark Pawlewicz