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Report No. EPGS-DOM.15-85MPA

Vitrinite reflectance (Ro) of dispersed organics from Texaco Shell et al. BLUE H-28.

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Vitrinite Reflectance (Ro) of dispersed organics from Texaco Shell et al. Blue H-28.

"Quotation in full or in part from this report must be with the prior approval of the Eastern Petroleum Geology Subdivision of the Atlantic Geoscience Centre, Dartmouth, Nova Scotia".

G.S.C. Locality No: D181

Location: 49°37'26.95"N, 49°18'01.94"W

R.T. Elevation: 15.0m

Sample Interval: 2100 - 6103m

Total Depth: 6103m

Water Depth: 1486m

Release Date: August 26,1981

Interval Studied: 2660 - 6100m

Depth Units: Meters referenced to R.T.

Vitrinite Reflectance has been determined on 23 samples (Table II) from Texaco Shell et al. Blue H-28, which was classified as a wildcat well and is located on the continental slope, approximately 325km (221mi) northeast of St.John's, Newfoundland (Texaco, 1980).

Data acquisition and manipulation for this report utilized the Zeiss Photomultiplier III Zonax microcomputer system with improvements in software to provide a dynamic histogram display as readings are acquired. Sample preparation followed the procedures listed in Appendix I. The analysis of the well revealed the thermal maturation intervals given in Table I. Specific maturation levels as set out in this report were based on those of Dow with modified terminology (1977,Appendix II).

Table I
Inferred Thermal Maturation Levels

Projected			
Seaflr-1831m	0.26 - 0.4	% Ro	immature
1831 - 2529m	0.4 - 0.5	% Ro	immature approaching maturity
Determined			
2529 - 3100m	0.5 - 0.6	% Ro	marginally mature
3100m	0.6	% Ro	onset of significant oil generation
4000m	0.8	% Ro	peak of oil generation
4698m	1.0	% Ro	onset of significant wet gas generation
5268m	1.2	% Ro	onset of significant dry gas generation
5637m	1.35	% Ro	oil floor

Note: Ro = R_o or reflectance of the vitrinite observed under oil (546nm).

Remarks

The sample coverage of vitrinite reflectance data (Figure 1,Table II) was adequate over most of the well. The line through the data points represents the best fit established by the least squares method.

The maturation curve for this well mostly lies within the 'oil window'. A number of factors account for this. Firstly, the 'top of the oil window' was reached at a rather shallow depth of 2529m. This is especially shallow when the 1486m water depth is subtracted. Secondly, because the slope of the curve is steep (0.14 log Ro/km) the 'oil floor' is reached at 5637m. At T.D. (6103m) a maturation of 1.57 % Ro is attained.

These maturation data provide evidence that the thermal regime at Blue H-28 was suitable for the generation and preservation of oil within the drilled section.

Discussion

The Gabriel C-60 well (310km SSE), recently run for vitrinite reflectance (Avery, 1985), also had a significant water depth (1108m). The slopes of both wells are very similar but the maturation curve of the Blue well, although parallel, is much higher in maturity. A comparison of depths below seafloor to significant maturation levels shows this difference. The 'top of oil window' is reached at 2834m in Gabriel and at 1043 in Blue while the 'peak of oil generation' is reached at 4120m and 2514m respectively. The Gabriel profile seems to fit the more normal or expected model since it projects to approximately 0.2 % Ro at the seafloor.

Since maturation is a function of time and temperature, an increase in either or both at Blue would explain it's relatively high maturation regime. However the sediments in Blue, having a much thicker Tertiary section would have caused the organics to be buried for the same or even shorter amount of time than at Gabriel. Also the section in Blue exhits no major hiati in sedimentation (Gradstein, 1983). And furthermore, the present day temperatures measured in Blue are lower, especially considering that the temperatures plotted for Gabriel are uncorrected and that static values would be higher (Figure 3). A higher geothermal gradient sometime in the past would therefore seem to be the only explanation for such a descrepancy.

It is difficult to find geological support for a scenerio of higher geothermal gradients in the past and therefore an alternate interpretation of the vitrinite reflectance data is suggested (Figure 2). This second curve is based on the possibility that most of the readings used to generate Figure 1 were taken on oxidized vitrinite particles. Measurements on such

particles would produce populations of high reflectance values which would not provide a true measure of the degree of maturation undergone by the samples. The average Ro values calculated in this second assessment are based on much smaller populations which were considered initially to be insufficent for determining a reliable maturation curve. Support for this second interpretation, based on a number of other maturation parameters, can be found in a geochemistry report on the Blue well (Dow,1979).

Another observation, which is not connected with the above mentioned discrepancy with the Gabriel well, is the occurance of very high rank (Ro) vitrinite in two samples (5700 and 5840m) near the bottom of the well, in the Paleozoics. The high reflectance particles are the dominate organics in both samples while a minor amount , probably representing cavings, was present in the two deepest samples. With reflectances in the 5.0+ % Ro range these values represent a very high coal rank of meta-anthracite. Since the system was calibrated on a 1.0 % Ro reflectance standard these values may have a considerable error (±) range. But the high anisotropy and general morphology of the particles support a very high coal rank.

One common explanation of very high rank organic particles over a narrow depth range in a well involves heating by a short-lived high heat source such as a igneous intrusion. However, igneous rock cuttings were not reported and natural semi-coke organic particles were completely absent from the polished kerogen samples. Thus there is no obvious support for high local heating and the particles are probably reworked detrital material.

The Ro values obtained on these particles are very similar to the rank of anthracite particles (5.4 % Ro) obtained from a DSDP hole on Orphan Knoll (242km ENE; Hacquebard, 1972). The Orphan Knoll particles were reported in Jurassic rocks and were also interpreted as detrital. Also, the Hare Bay E-21 well (210km NNW; Avery,1984b) intersected Carboniferous sediments with 'continental coal measures' containing 'at least 12 bona fide coal seams' (Umpleby,1980). The two deepest samples examined in Hare Bay had 3.0+ % Ro values (anthracite range). Further investigation might document interesting relationships between these occurences of very high rank coaly particles in the northeast Grand Banks area.

References

Avery, M.P., 1984. Vitrinite reflectance (Ro) on true coals and dispersed organics in BP et al. Hare Bay E-21. Report No. EPGS-DOM.16-84MPA.

Avery, M.P., 1985. Vitrinite reflectance (Ro) of dispersed organics from Esso Voyageur Gabriel C-60. Report No. EPGS-DOM.12-85MPA.

Barss, M.S., 1983. Palynological analyses of samples from Texaco Shell et al. Blue H-28. Report No. EPGS-PAL.7-83MSB.

Canada Oil and Gas Lands Administration (COGLA), 1983. Offshore schedule of wells. Department of Energy, Mines and Resources, Ottawa.

Dow, W.G., 1977. Kerogen studies and geological interpretations. Journal of Geochemical Exploration, no. 7, p. 79-99.

Dow, W.G., 1979. Geochemical analysis of Texaco-Shell et al. Blue H-28 well, offshore Newfoundland: Robertson Research (US) Inc. Report no. 90, Project: RRUS/790/II/28 (Open file report, available from Canada Oil and Gas Lands Administration Branch, Dept. of Energy, Mines and Resources, Canada.)

Gradstein, F.M., 1983. Stratigraphy and Depositional Environment of Texaco Blue H-28. Report No. EPGS-PAL.1-83FMG/FCT.

Hacquebard, P.A., 1972. Report on Carbonaceous Material from Orphan Knoll; in : Site 111, Laughton, A.S.,Berggen, W.A., et al., 1972, Initial Reports of the Deep Sea Drilling Project, Vol. XII, Washington.

Texaco Canada Resources Ltd.,Calgary, Alberta, 1980. Well report Texaco Shell et al. Blue H-28. Open file report, Department of Energy, Mine and Resources, Ottawa.

Umpleby, D.C., 1980. Statigraphy of BP et al. Hare Bay E-21. Report No. EPGS-STRAT.22-80DCU.

December 19, 1985.

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Table II

Summary of vitrinite reflectance

Seq. #	Sample #	Depth in meters	Mean Ro (SD) non-rotated Edit 1	Edit 2	Number of readings Total	Ed.1	Ed.2
1	K0554A	2660-2670	.55(±.04)	.34(±.04)	67	12	3
2	K0554B	2810-2820	.52(±.03)	.22(±.05)	63	8	2
3	K0554C	3010-3020	.55(±.04)	.29(±.05)	62	26	4
4	K0555A	3130-3140	.69(±.07)	.31(±.04)	76	37	5
5	K0555B	3290-3330	.69(±.04)	.32(±.08)	63	16	8
6	K0555C	3410-3420	.71(±.08)	.36(±.06)	33	15	3
7	K0556A	3590-3600	.72(±.06)	.36(±.08)	48	20	5
8	K0556B	3750-3760	.68(±.09)	.39(±.03)	52	30	6
9	K0556C	4030-4040	.7 (±.09)	.37(±.06)	89	41	34
10	K0557A	4150-4160	.82(±.06)	.38(±.06)	79	28	27
11	K0557B	4330-4340	.89(±.06)	.48(±.04)	46	23	5
12	K0557C	4480-4490	.87(±.07)	.51(±.04)	99	31	17
13	K0558A	4690-4700	1.00(±.05)	.56(±.08)	99	37	27
14	K0558B	4770-4780	1.04(±.05)	.6 (±.08)	43	13	9
15	K0558C	4930-4940	1.16(±.06)	.63(±.06)	92	32	6
16	K0559A	5070-5080	1.11(±.06)	.68(±.08)	99	29	8
17	K0559B	5230-5240	1.13(±.06)	.72(±.07)	99	30	9
18	K0559C	5400-5410	1.2 (±.08)	.72(±.03)	99	49	2
19	K0560A	5530-5540	1.39(±.08)	.63(±.05)	86	38	9
20	K0560B	5690-5700	1.53(±.13)	-----	99	13	--
21	K0560C	5830-5840	1.43(±.11)	.88(±.06)	99	31	9
22	K0561A	5970-5980	1.44(±.08)	.9 (±.05)	76	33	4
23	K0562B	6090-6100	1.6 (±.06)	.89(±.04)	89	23	4

Note : All samples are Kerogen Type.

Table III

Formation Tops (COGLA, 1983)

Depth	Formation
4837m	Upper Cretaceous SS
4964m	Coarse SS
5134m	Verrill Canyon
5281m	Paleozic LS
5380m	Shale
5615m	Shale & Quartize
6103m	T.D.

Table IV

Biostrat data

Depth	(Gradstein, 1983)
2070m	in Pliocene
3170m	top Miocene
3810m	top Oligocene
3830m	top Eocene
4840m	top Late Cret.
4880m	top Early Cret.
	(Barss, 1983)
5550 - 5680m	Visean to Namurian

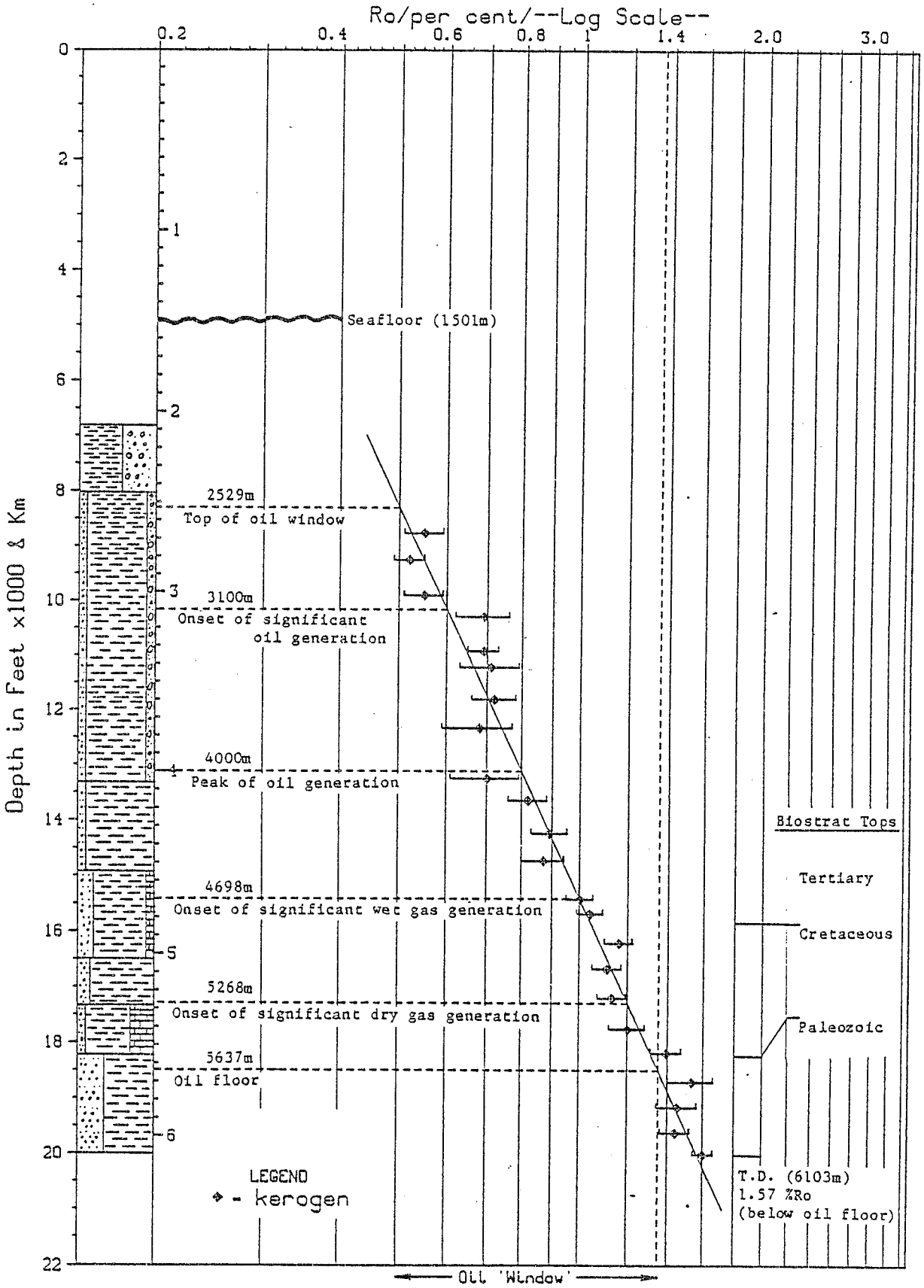


Fig. 1 Blue H-28

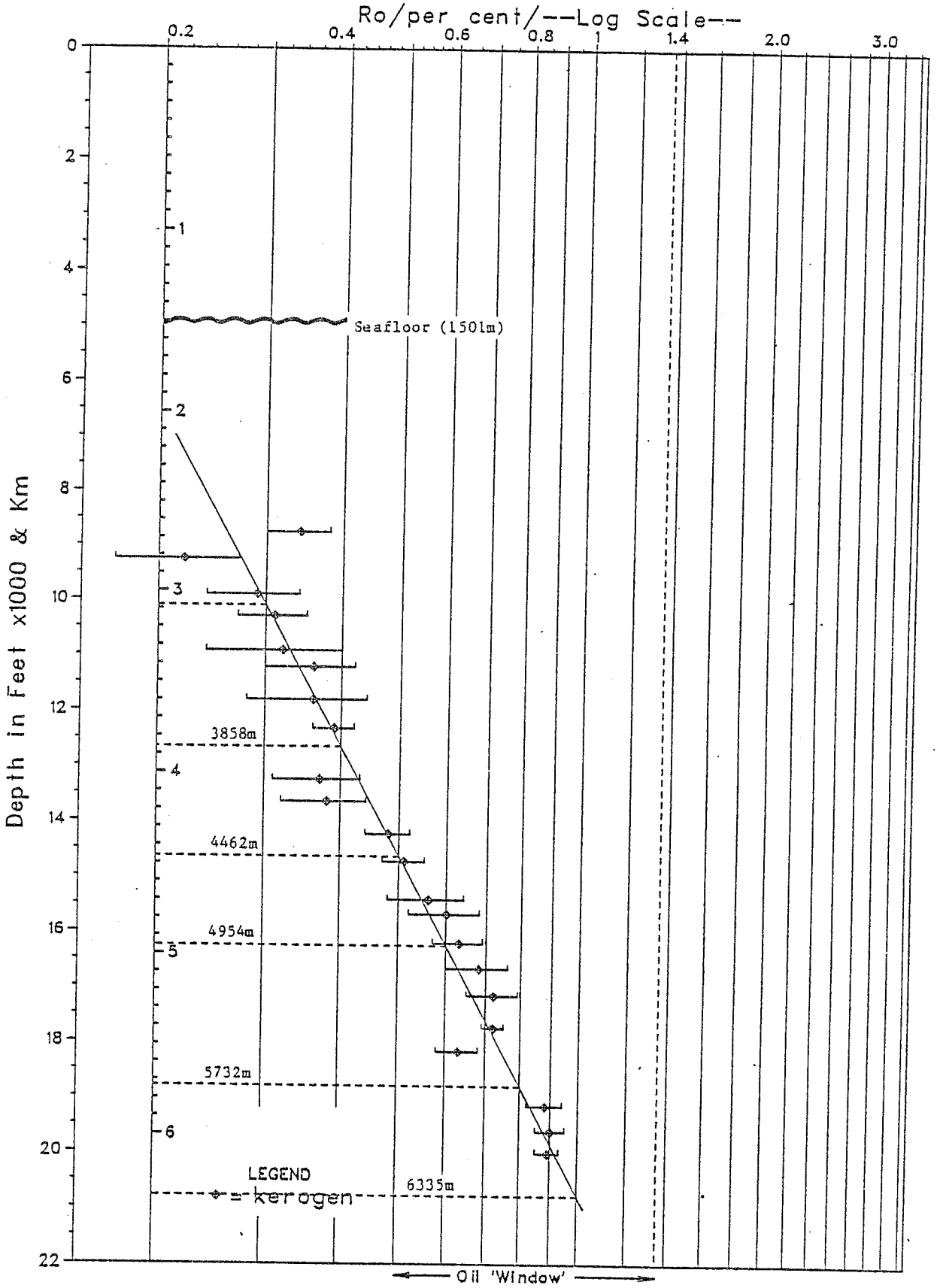


Fig. 2 Blue H-28 (Alternace Profile)

FIGURE 19

TEXACO SHELL ET AL BLUE H-28
FORMATION STATIC TEMPERATURE PLOT

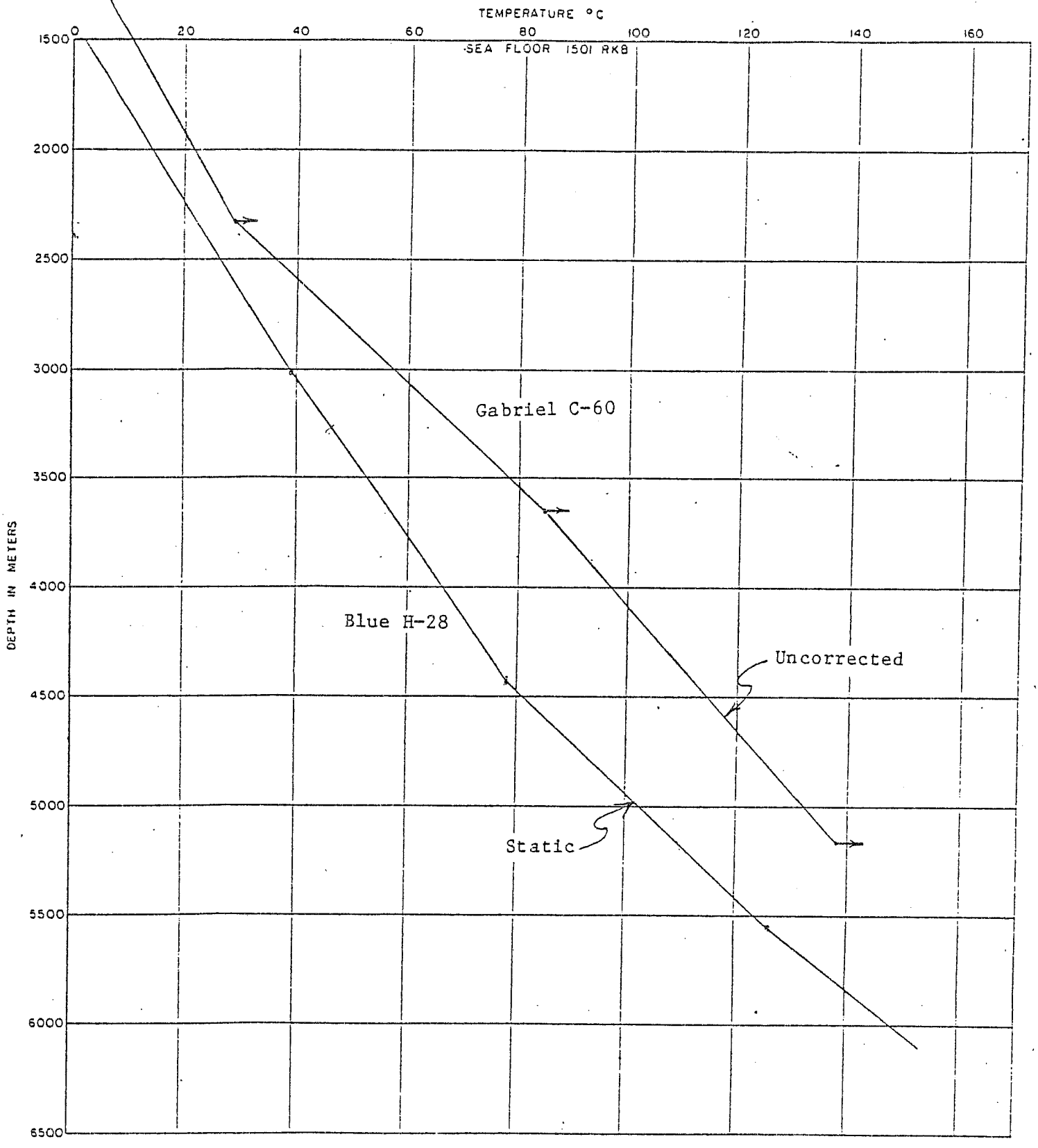


Fig. 3 Comparison of Thermal Gradients (taken from well report plots)

APPENDIX I

Sample Preparation Method

COGLA Lab preparation

Preliminary Wash
Samples dried in oven
Split: a. all of coarse to Petrology Lab
b. ½ medium to Palynology Lab
c. rest of medium and all of fine combined for Micropaleo Lab
Split "b" is delivered to Palynology Lab and treated as follows:

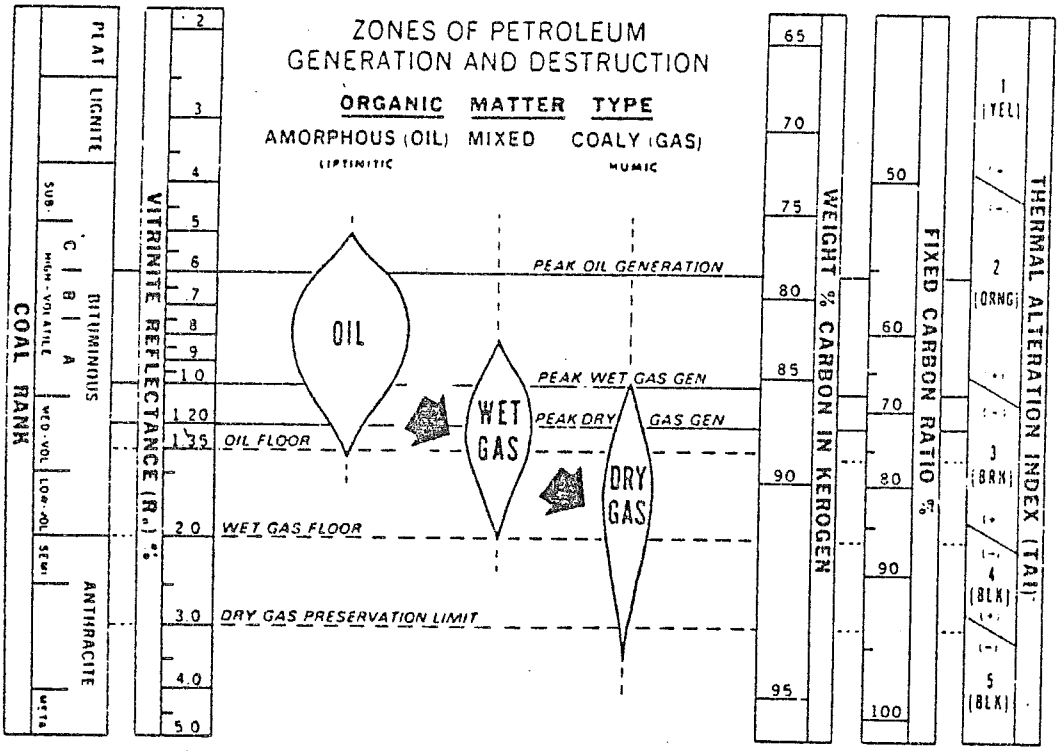
PALYNOLOGY Lab preparation

20-30 grams placed in 250ml plastic beaker.
Add 10% HCl till reaction ceases (removes carbonates).
Washed (rinsed) 3 times.
Conc. HF overnight (removes silicates).
Washed (rinsed) 3 times.
Heated (60-65°C) conc. HCl (remove fluorides caused by HF).
Washed 3 times.
Then put into 15ml test tube with 4-5ml 4% Alconox.
Differential centrifuge at 1500rpm for 90 sec.
Decant.
Wash 3 times with centrifuging.
Float off organic fraction using 2.0 S.G. Znbr solution.
Centrifuge 1000rpm, 8 min.
Float fraction into second test tube.
Wash 3 times with centrifuging.
Kerogen smear slide made.
Remaining kerogen material delivered to Vitrinite Reflectance Lab.

VITRINITE REFLECTANCE Lab preparation

Excess water pipetted off.
Freeze dried.
Mounted using epoxy resin (EPO-TEK 301) in predrilled plastic stubs.
Polished using modified coal petrology polishing methods.
Examined under oil lens at approximately 800x mag'n.

Appendix II (Dow,1977)



Note: For these reports, the terminology used to describe the various maturation levels has been modified. The 'peak' designation, as used in this figure, has been changed to 'onset of significant' and 0.8 Ro is now used as the 'peak of oil generation' (Table I, Figure 1).

Vitrinite Reflectance Histograms

EDIT 1

FILE >> K0554A DESCRIPTION FOLLOWS :
DEPTH 2660-2670M, BLUE H-28, MIKE AVERY, AUG-31-85

COL>	0	1	2	3	4	5	6	7	8	9
ROW		.3	.33	.38	*.5	*.5	*.51	*.53	*.54	*.56
1	*.57	*.57	*.58	*.59	*.6	*.6	*.63	*.65	*.66	*.68
2	*.69	.74	.77	.78	.82	.83	.91	.94	1.06	1.11
3	1.15	1.21	1.24	1.24	1.24	1.25	1.25	1.28	1.31	1.32
4	1.33	1.34	1.34	1.35	1.35	1.36	1.36	1.36	1.37	1.37
5	1.4	1.41	1.41	1.41	1.42	1.42	1.42	1.43	1.43	1.43
6	1.45	1.46	1.46	1.46	1.46	1.5	1.51	1.51		

	SUM	NUMBER	MIN	MAX	MEAN	STAND.DEV.
TOTAL >	70.94	67	.3	1.51	1.06	.38
*EDIT >	9.96	17	.5	.69	.59	.06

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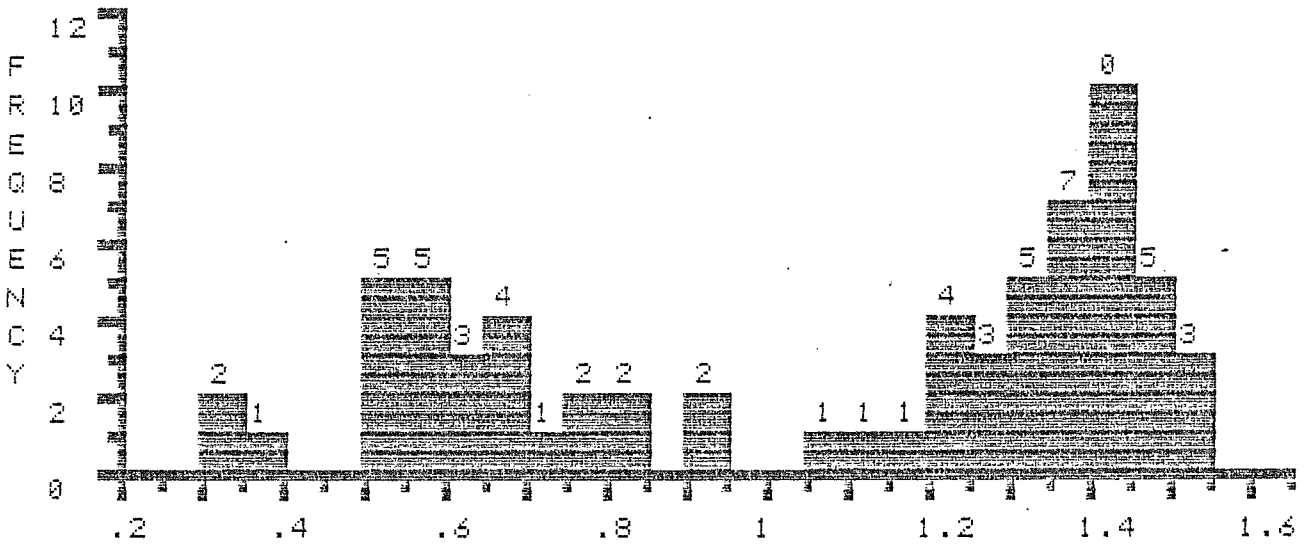

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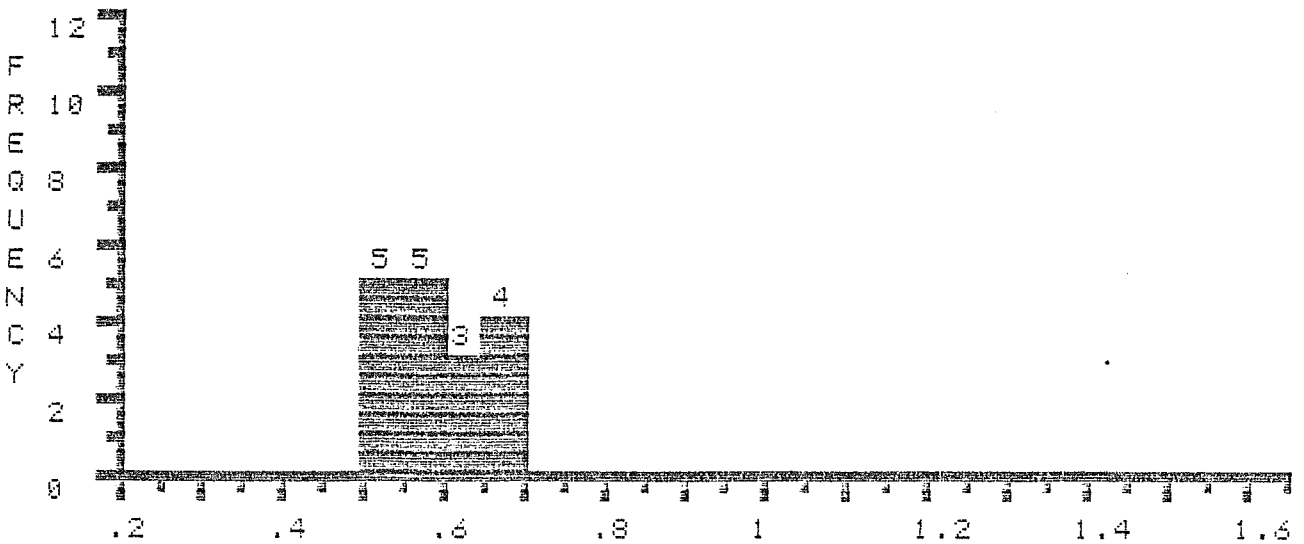
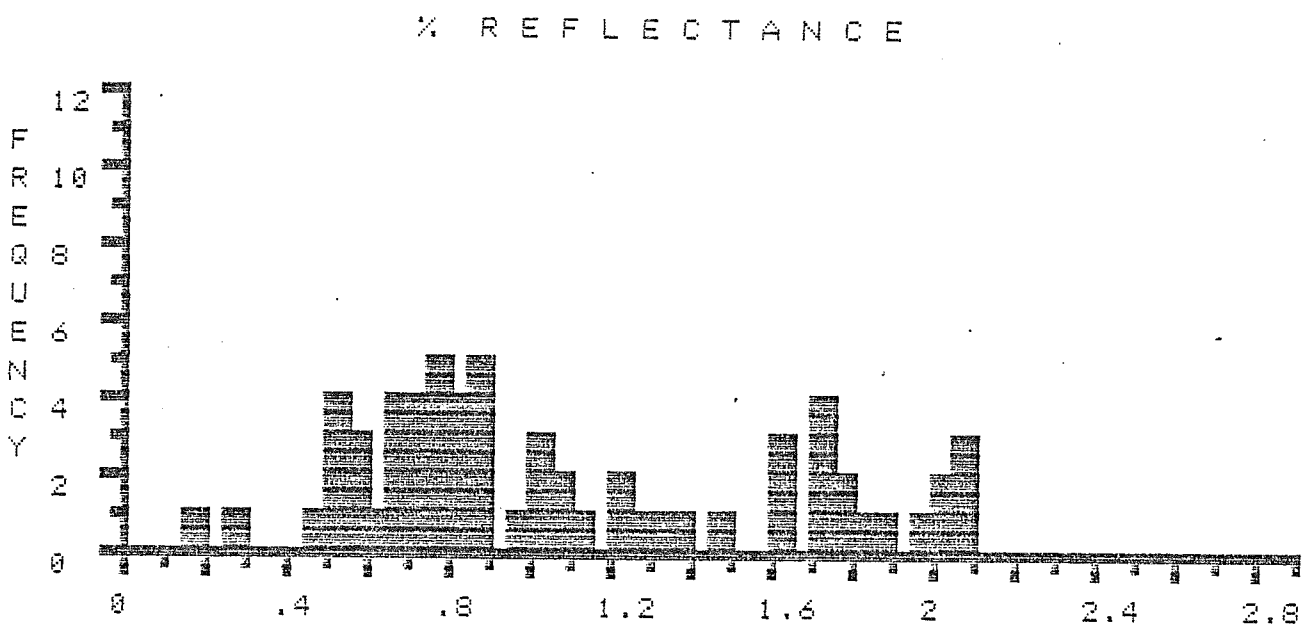
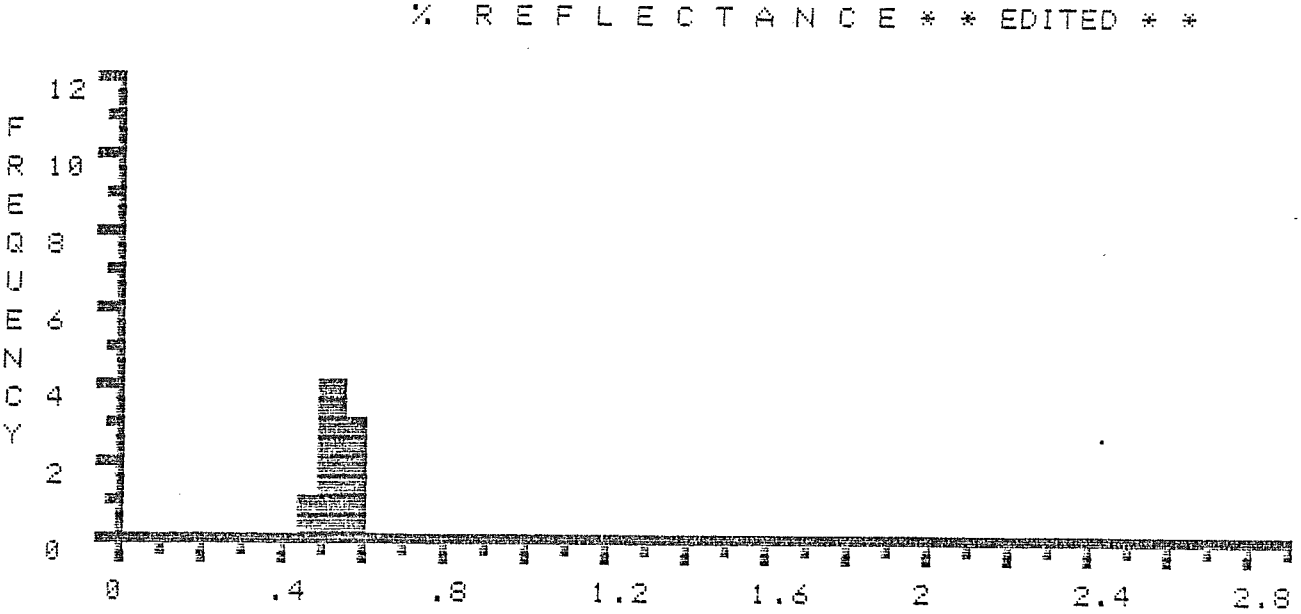


FILE >> K0554B DESCRIPTION FOLLOWS :
DEPTH 2810-2820M. BLUE H-28, MIKE AVERY, AUG-31-85

COL>	0	1	2	3	4	5	6	7	8	9
ROW		.18	.25	*.49	*.51	*.51	*.52	*.53	*.55	*.56
1	*.59	.64	.65	.68	.68	.69	.7	.72	.72	.74
2	.76	.77	.78	.79	.79	.81	.83	.83	.84	.85
3	.86	.88	.88	.88	.99	1.02	1.04	1.04	1.07	1.09
4	1.14	1.23	1.24	1.29	1.32	1.35	1.49	1.61	1.62	1.63
5	1.71	1.73	1.74	1.74	1.77	1.78	1.8	1.87	1.95	2
6	2.04	2.05	2.05	2.06						

	SUM	NUMBER	MIN	MAX	MEAN	STAND.DEV.
TOTAL >	68.92	68	.18	2.06	1.09	.52
*EDIT >	4.26	8	.49	.59	.53	.03

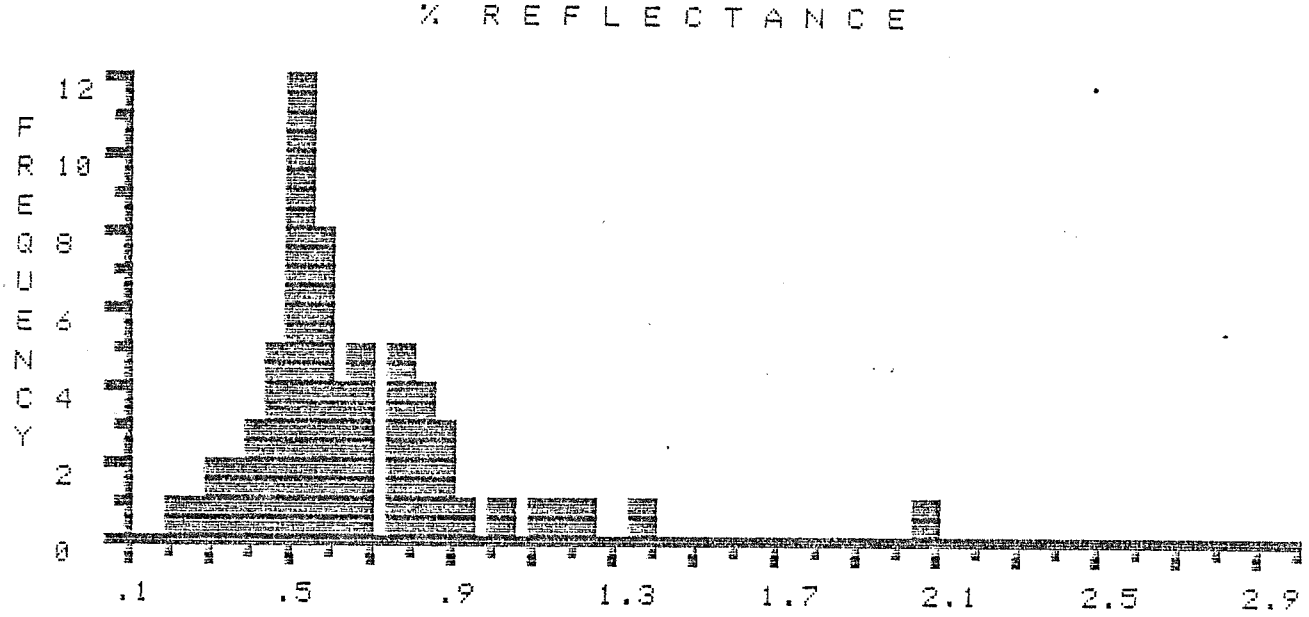


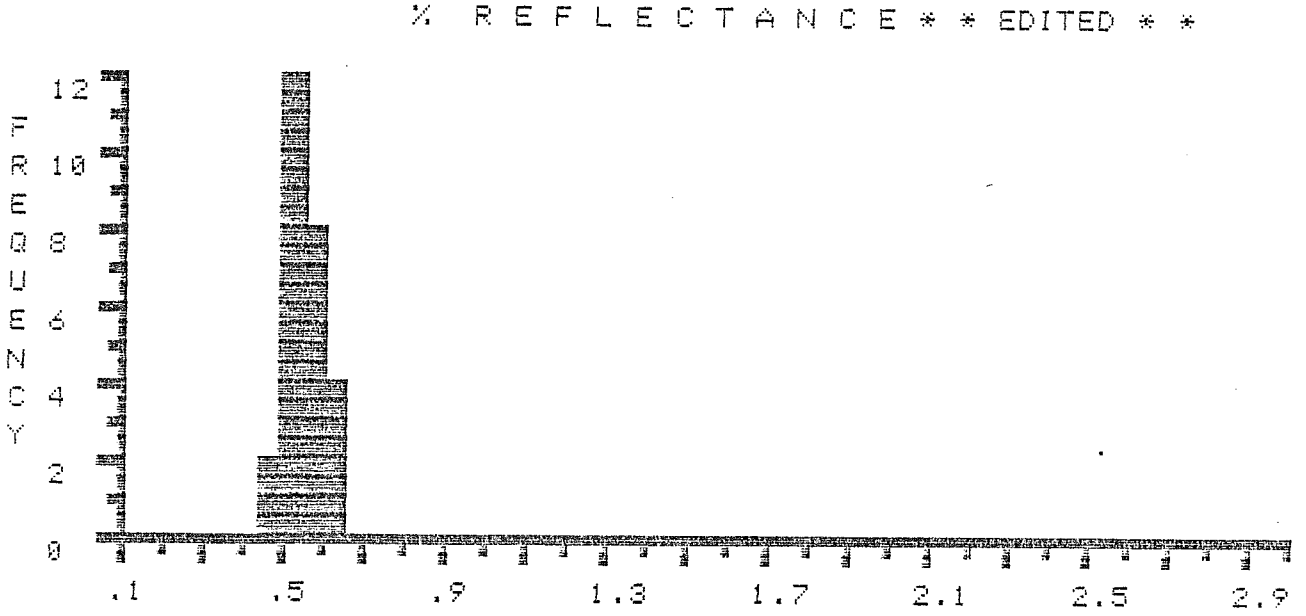


FILE >> K0554C DESCRIPTION FOLLOWS :
DEPTH 3010-3020M, HIBERNIA B-08, MIKE AVERY, SEPT-7-85

COL>	0	1	2	3	4	5	6	7	8	9
ROW		.21	.29	.31	.33	.37	.39	.41	.43	.43
1	.45	.45	.46	*.49	*.49	*.5	*.5	*.51	*.51	*.51
2	*.52	*.52	*.53	*.53	*.53	*.54	*.54	*.55	*.55	*.55
3	*.56	*.56	*.56	*.59	*.59	*.6	*.6	*.62	*.63	.68
4	.68	.68	.69	.69	.75	.75	.76	.76	.78	.81
5	.82	.82	.84	.87	.88	.89	.91	1.04	1.12	1.16
6	1.21	1.38	2.07							

	SUM	NUMBER	MIN	MAX	MEAN	STAND.DEV.
TOTAL >	40.75	62	.21	2.07	.66	.29
*EDIT >	14.18	26	.49	.63	.55	.04





FILE >> K0555A DESCRIPTION FOLLOWS :
DEPTH 3130-3140M, HIBERNIA B-08, MIKE AVERY, SEPT-7-85

COL>	0	1	2	3	4	5	6	7	8	9
ROW		.24	.31	.33	.34	.34	.41	.43	.43	.43
1	.44	.44	.45	.46	.47	.47	.48	.48	.48	.48
2	.48	.48	.5	*.55	*.56	*.57	*.59	*.6	*.6	*.63
3	*.63	*.63	*.64	*.64	*.65	*.65	*.66	*.67	*.67	*.67
4	*.68	*.69	*.69	*.69	*.7	*.71	*.72	*.72	*.73	*.73
5	*.74	*.75	*.76	*.76	*.77	*.78	*.79	*.8	*.81	*.81
6	.84	.86	.87	.89	.93	.96	.96	.97	.99	1
7	1.04	1.1	1.12	1.15	1.19	1.26	1.45			

	SUM	NUMBER	MIN	MAX	MEAN	STAND.DEV.
TOTAL >	52.39	76	.24	1.45	.69	.24
*EDIT >	25.44	37	.55	.81	.69	.07

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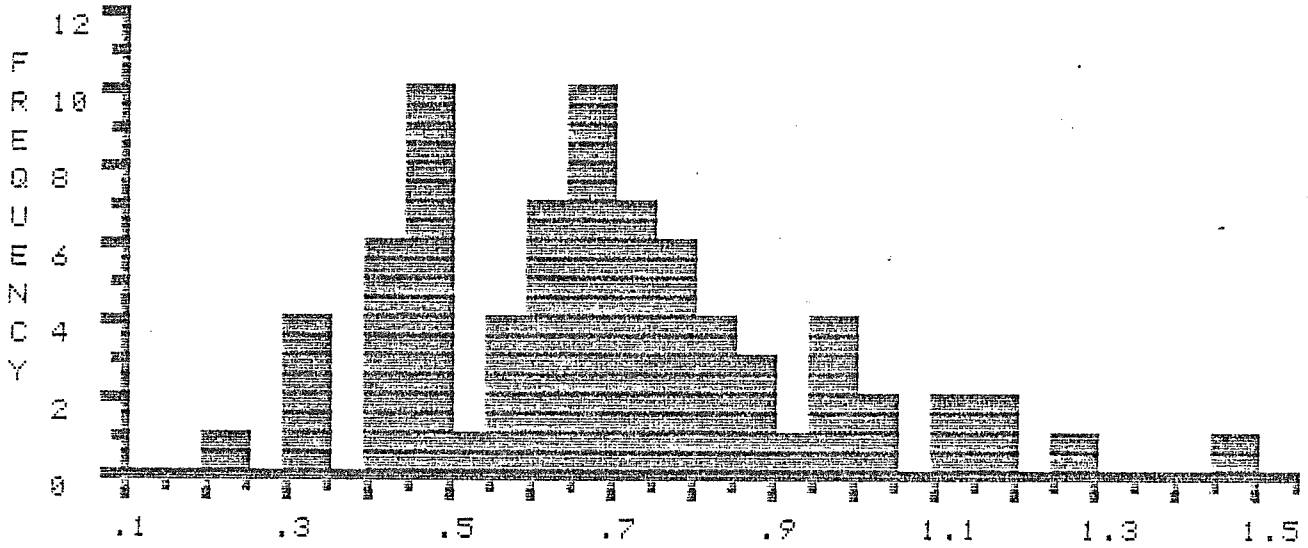

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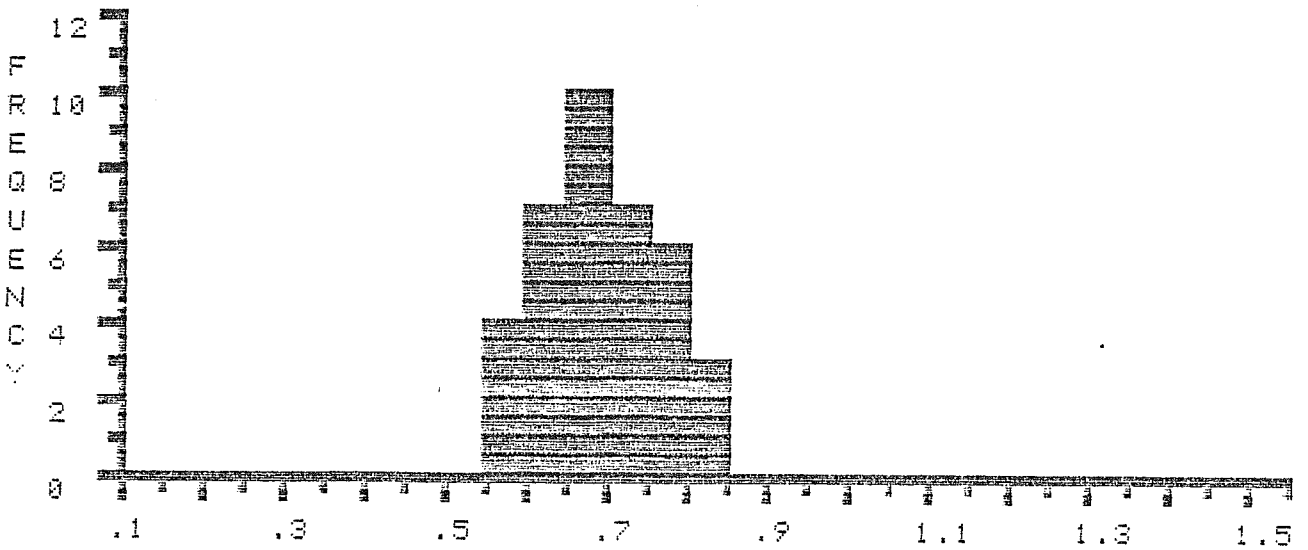
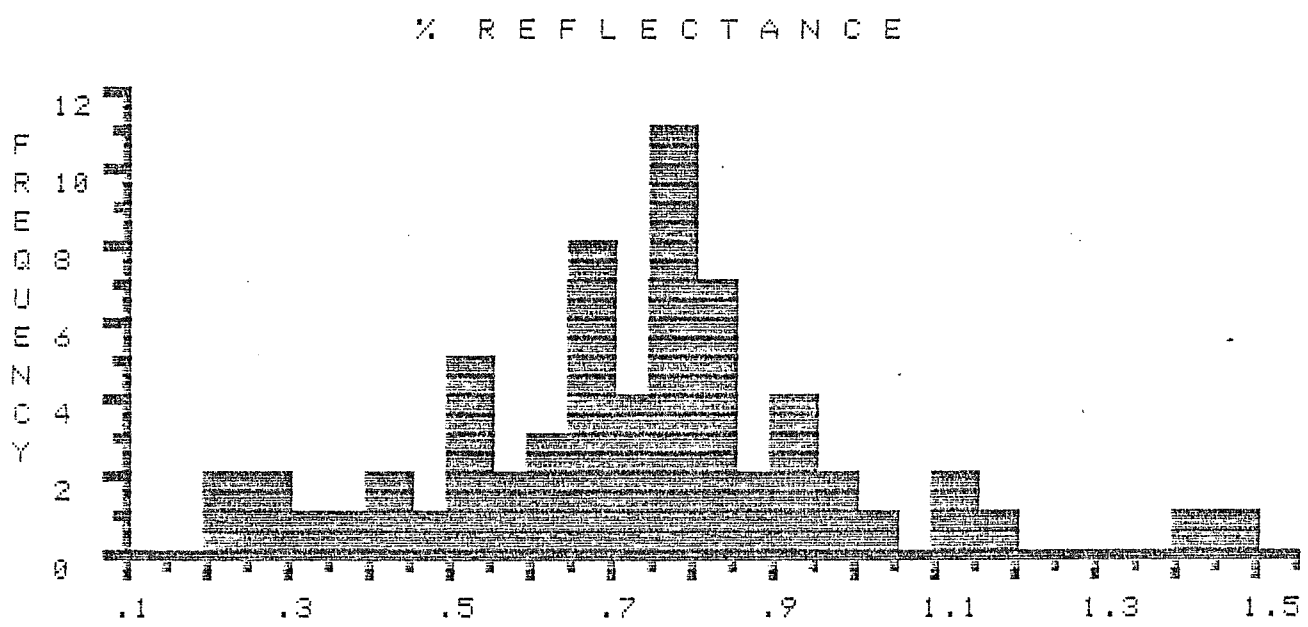
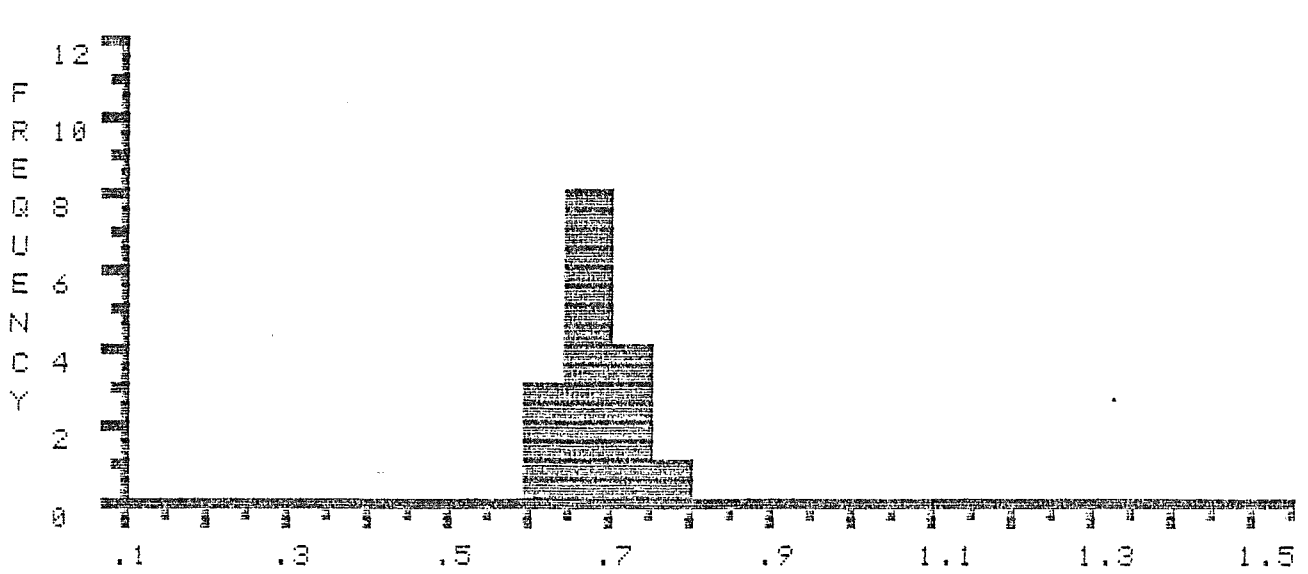


FILE >> K0555B DESCRIPTION FOLLOWS :
DEPTH 3290-3300M, BLUE H-28, MIKE AVERY, SEPT-7-85

COL>	0	1	2	3	4	5	6	7	8	9
ROW		.2	.23	.27	.28	.34	.39	.41	.41	.47
1	.5	.51	.52	.53	.54	.55	.57	*.62	*.63	*.64
2	*.65	*.66	*.66	*.68	*.68	*.69	*.69	*.69	*.71	*.73
3	*.74	*.74	*.75	.77	.77	.77	.77	.78	.78	.78
4	.79	.79	.79	.8	.8	.8	.81	.83	.83	.84
5	.88	.89	.9	.91	.92	.92	.96	.97	1.02	1.11
6	1.13	1.16	1.4	1.47						

	SUM	NUMBER	MIN	MAX	MEAN	STAND.DEV.
TOTAL >	45.82	63	.2	1.47	.73	.25
*EDIT >	10.96	16	.62	.75	.69	.04

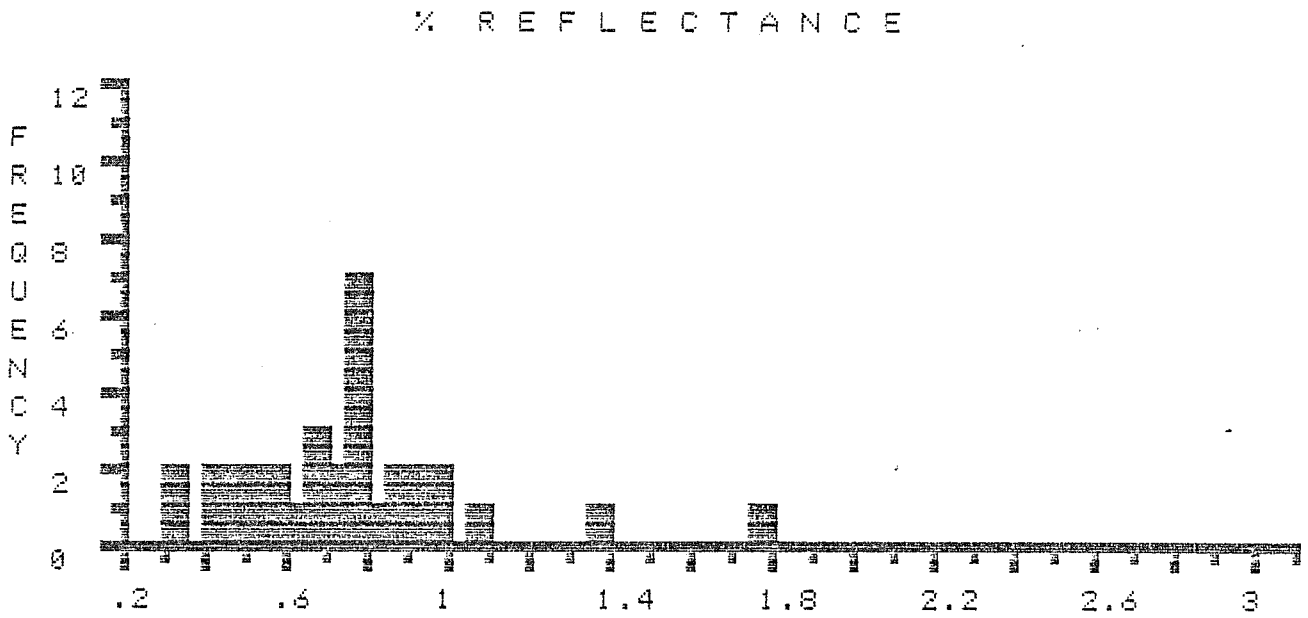


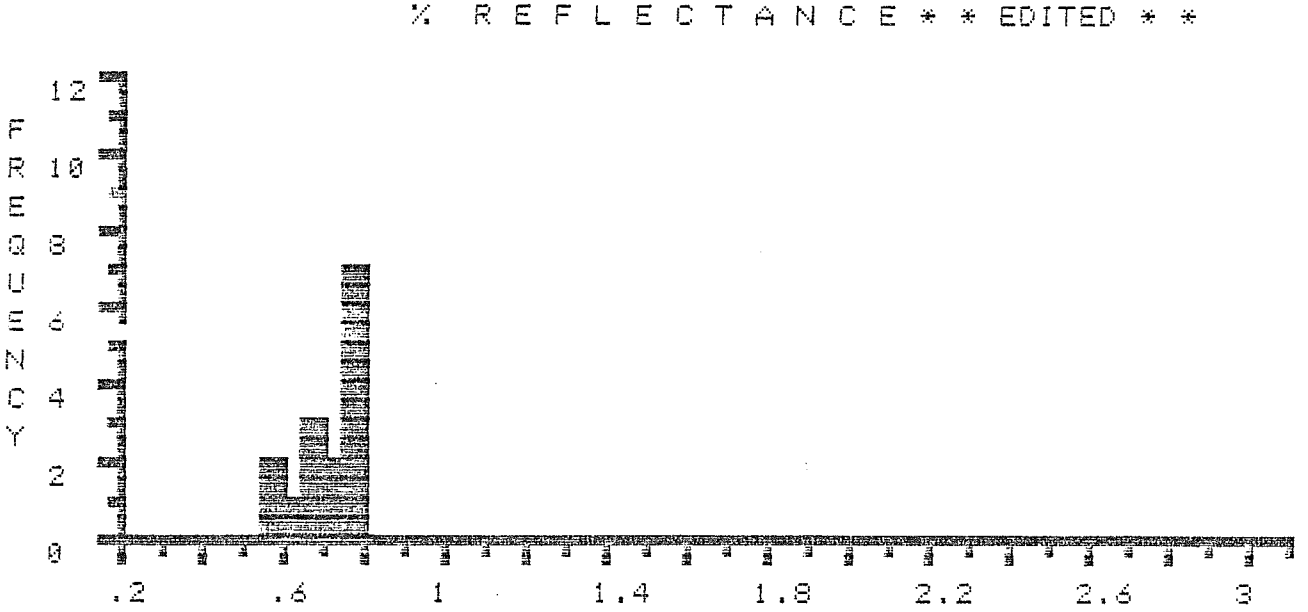


FILE >> K0555C DESCRIPTION FOLLOWS :
DEPTH 3410-3420M, BLUE H-28, MIKE AVERY, SEPT-7-85

COL>	0	1	2	3	4	5	6	7	8	9
ROW		.31	.34	.42	.44	.46	.47	.5	.54	*.57
1	*.59	*.62	*.66	*.67	*.69	*.72	*.73	*.75	*.76	*.78
2	*.78	*.79	*.79	*.79	.84	.85	.87	.94	.94	.96
3	.97	1.07	1.39	1.79						

	SUM	NUMBER	MIN	MAX	MEAN	STAND.DEV.
TOTAL >	24.79	33	.31	1.79	.75	.29
*EDIT >	10.69	15	.57	.79	.71	.08



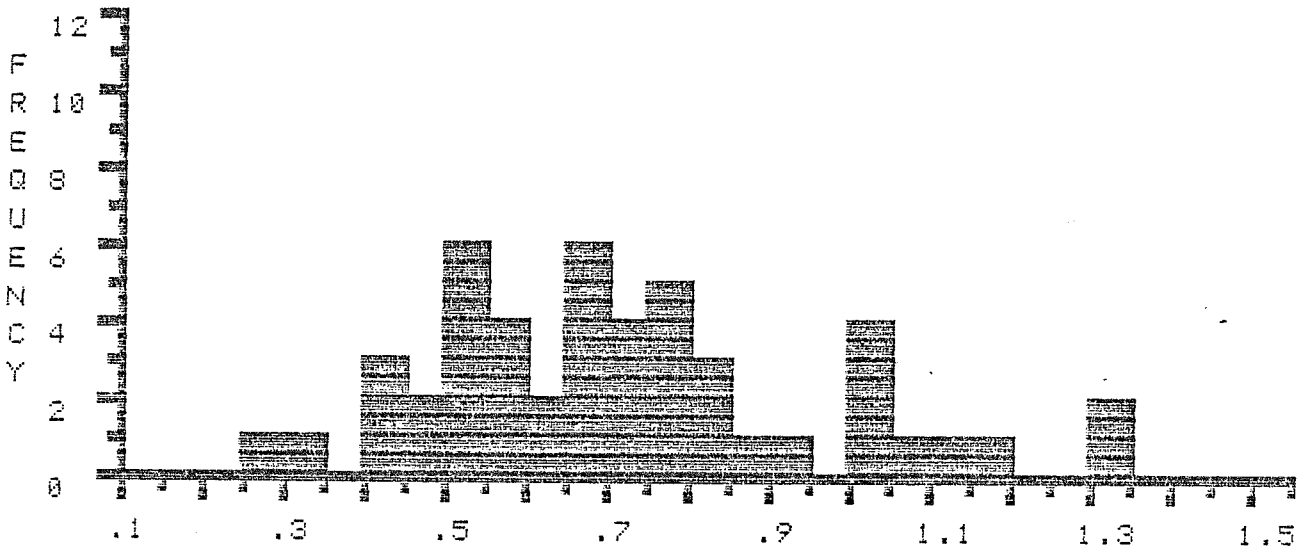


FILE >> K0556A DESCRIPTION FOLLOWS :
DEPTH 3590-3600M. BLUE H-28. MIKE AVERY. SEPT-7-85

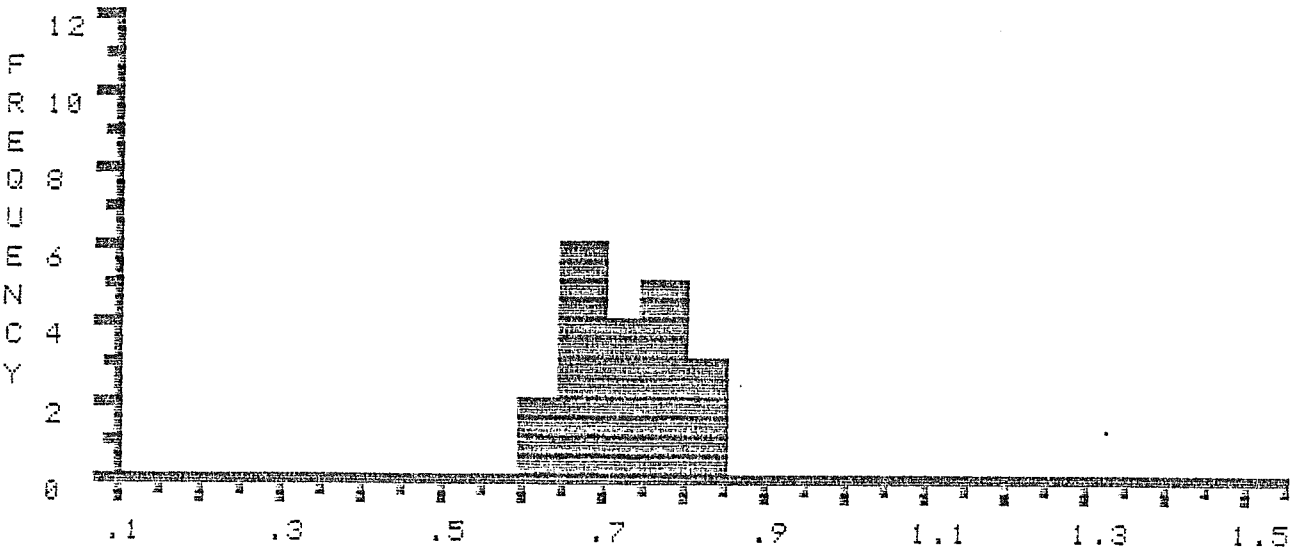
COL>	0	1	2	3	4	5	6	7	8	9
ROW		.25	.3	.41	.41	.43	.47	.47	.5	.51
1	.51	.52	.54	.54	.55	.56	.57	.57	*.6	*.63
2	*.67	*.67	*.68	*.68	*.68	*.68	*.72	*.73	*.73	*.73
3	*.75	*.77	*.77	*.78	*.78	*.8	*.8	*.8	.89	.92
4	1	1	1.03	1.04	1.08	1.12	1.18	1.31	1.31	

	SUM	NUMBER	MIN	MAX	MEAN	STAND.DEV.
TOTAL >	34.44	48	.25	1.31	.72	.25
*EDIT >	14.45	20	.6	.8	.72	.06

% R E F L E C T A N C E



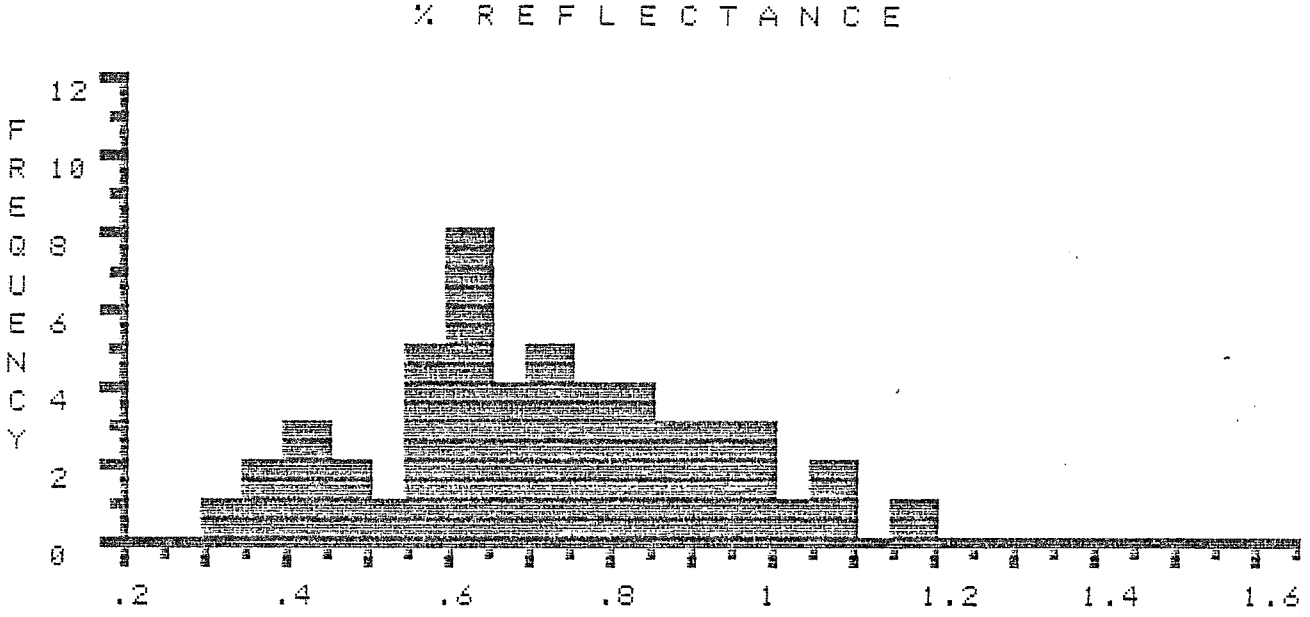
% R E F L E C T A N C E * * EDITED * *

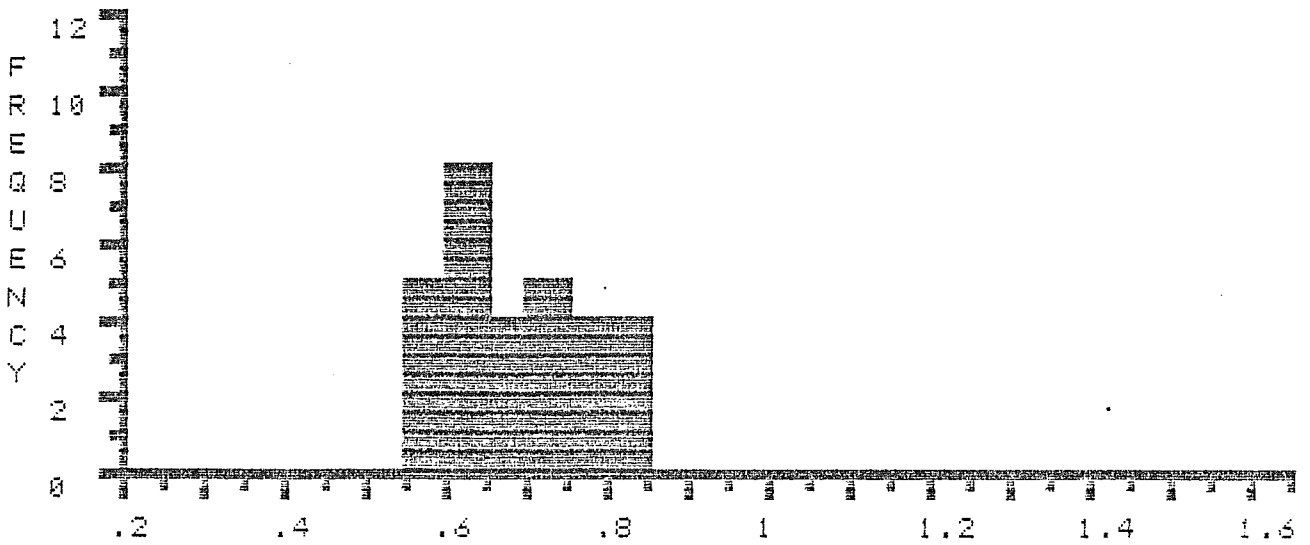


FILE >> K0556B DESCRIPTION FOLLOWS :
DEPTH 3750-3760M, BLUE H-28, MIKE AVERY, SEPT-7-85

COL>	0	1	2	3	4	5	6	7	8	9
ROW		.33	.39	.39	.4	.41	.43	.48	.49	.51
1	*.55	*.55	*.55	*.57	*.57	*.6	*.6	*.62	*.62	*.63
2	*.63	*.64	*.64	*.65	*.66	*.67	*.68	*.71	*.71	*.72
3	*.72	*.73	*.76	*.77	*.77	*.77	*.8	*.8	*.82	*.83
4	.86	.86	.89	.9	.92	.94	.95	.97	.98	1.01
5	1.09	1.09	1.17							

	SUM	NUMBER	MIN	MAX	MEAN	STAND.DEV.
TOTAL >	36.8	52	.33	1.17	.71	.2
*EDIT >	20.34	30	.55	.83	.68	.09



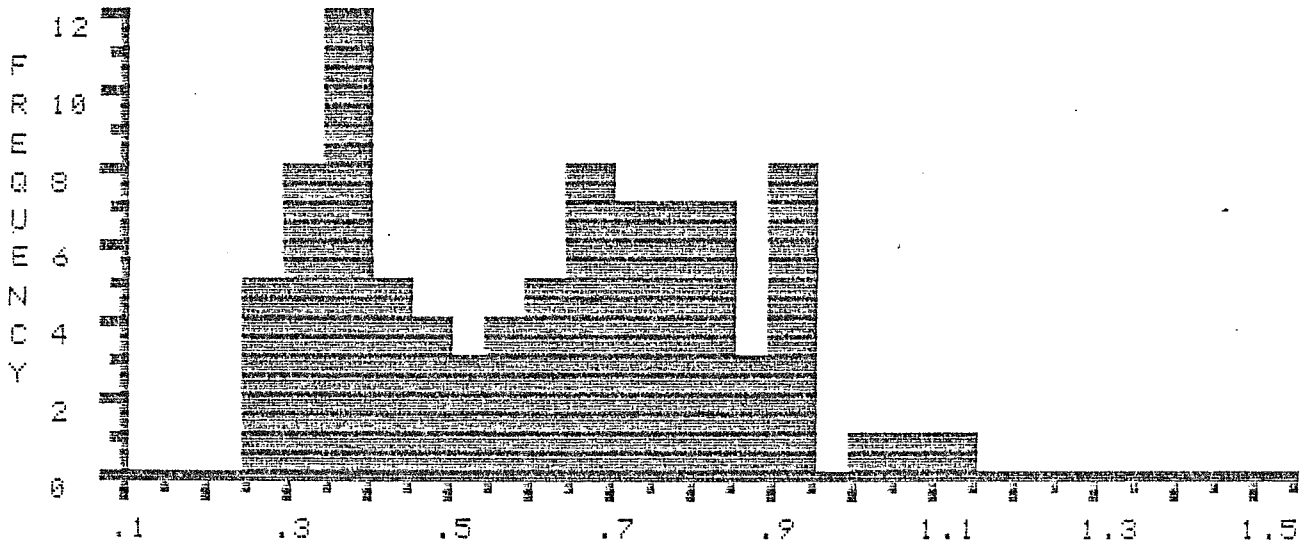


FILE >> K0556C DESCRIPTION FOLLOWS :
DEPTH 4030-4040M, SLUE H-28, MIKE AVERY, SEPT-7-85

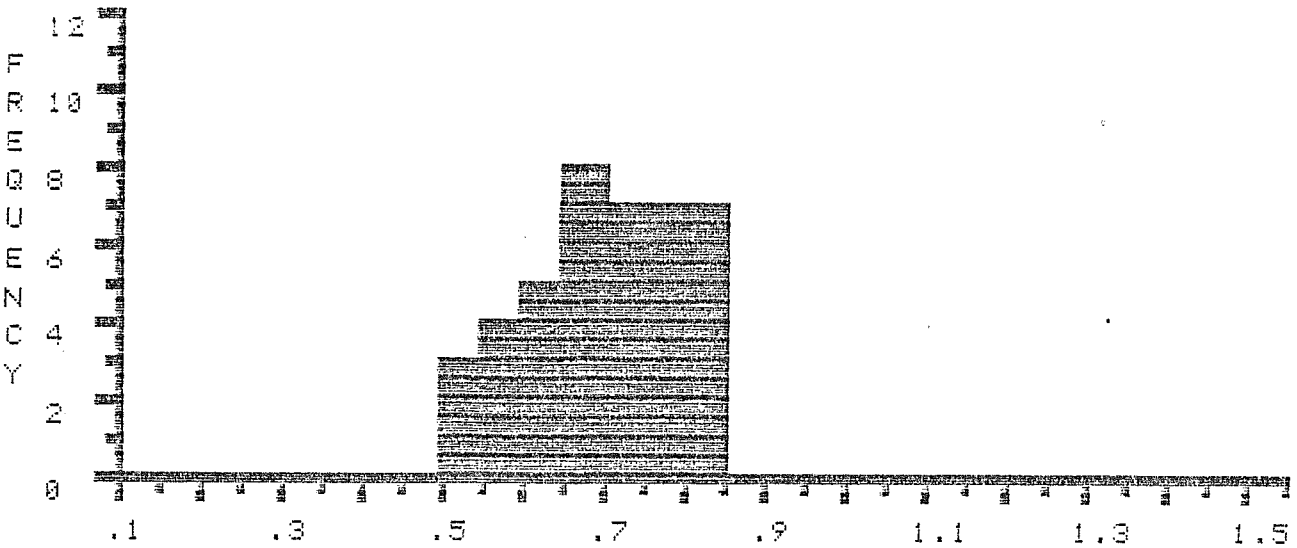
COL>	0	1	2	3	4	5	6	7	8	9
ROW		.27	.28	.29	.29	.29	.3	.31	.33	.33
1	.34	.34	.34	.34	.35	.35	.35	.35	.35	.36
2	.37	.37	.38	.39	.39	.39	.41	.43	.44	.44
3	.44	.45	.46	.48	.49	*.52	*.54	*.54	*.55	*.57
4	*.59	*.59	*.62	*.63	*.64	*.64	*.64	*.65	*.66	*.67
5	*.67	*.67	*.67	*.68	*.69	*.7	*.7	*.7	*.71	*.73
6	*.73	*.73	*.75	*.75	*.76	*.77	*.78	*.78	*.78	*.8
7	*.8	*.81	*.82	*.82	*.83	*.84	.87	.87	.88	.9
8	.9	.91	.91	.91	.92	.93	.93	1	1.08	1.13

	SUM	NUMBER	MIN	MAX	MEAN	STAND.DEV.
TOTAL >	54.15	89	.27	1.13	.61	.22
*EDIT >	28.52	41	.52	.84	.7	.09

% R E F L E C T A N C E



% R E F L E C T A N C E * * EDITED * *

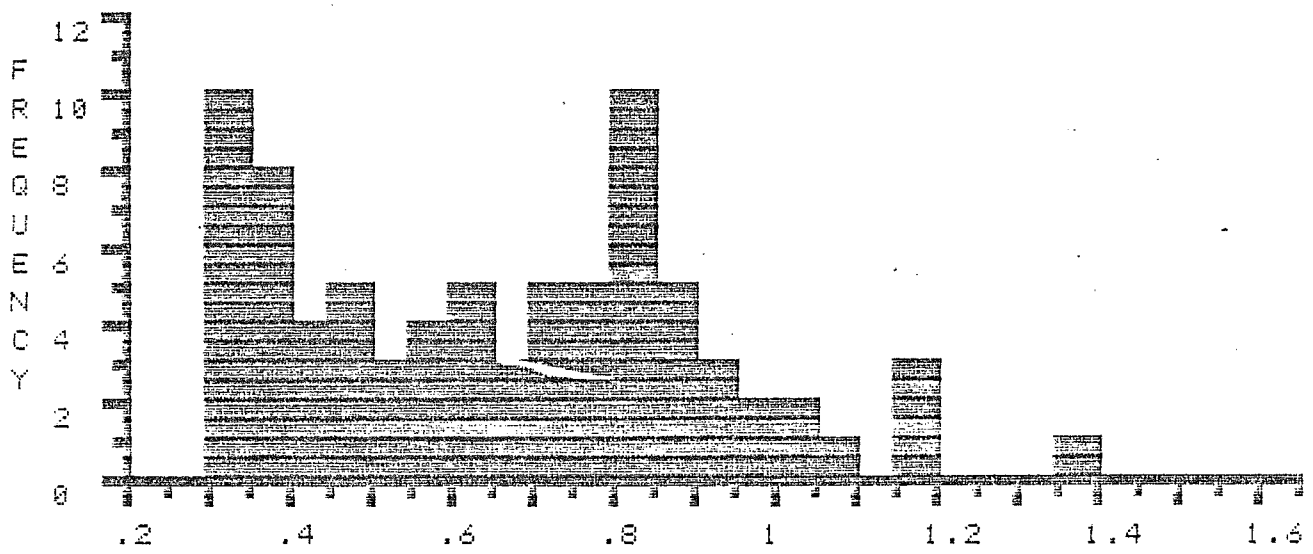


FILE >> K0557A DESCRIPTION FOLLOWS :
DEPTH 4150-4160M, BLUE H-28, MIKE AVERY, SEPT-24-85

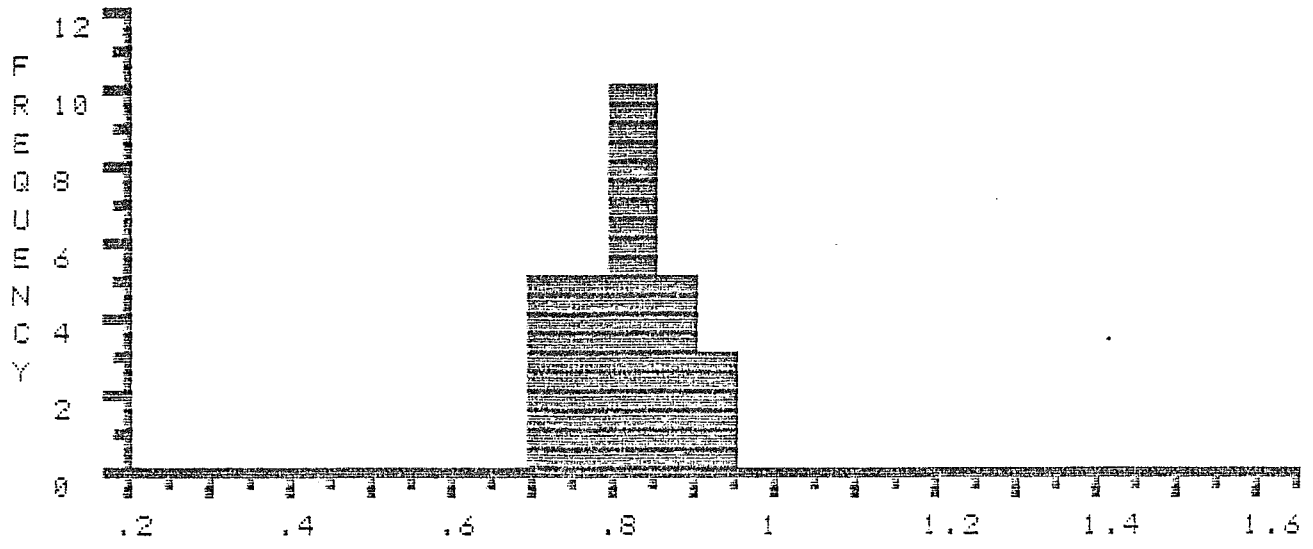
COL>	0	1	2	3	4	5	6	7	8	9
ROW		.3	.31	.32	.32	.32	.33	.33	.33	.33
1	.34	.35	.35	.36	.36	.37	.37	.38	.39	.4
2	.41	.44	.44	.45	.46	.47	.48	.49	.51	.53
3	.54	.56	.58	.59	.59	.6	.61	.61	.62	.64
4	.65	.68	.68	*.72	*.73	*.74	*.74	*.74	*.75	*.78
5	*.79	*.79	*.79	*.8	*.81	*.82	*.82	*.82	*.82	*.84
6	*.84	*.84	*.84	*.85	*.85	*.85	*.87	*.87	*.9	*.92
7	*.93	.96	.98	1	1	1.06	1.15	1.17	1.19	1.39

	SUM	NUMBER	MIN	MAX	MEAN	STAND.DEV.
TOTAL >	51.95	79	.3	1.39	.66	.25
*EDIT >	22.86	28	.72	.93	.82	.06

% R E F L E C T A N C E



% R E F L E C T A N C E * * EDITED * *

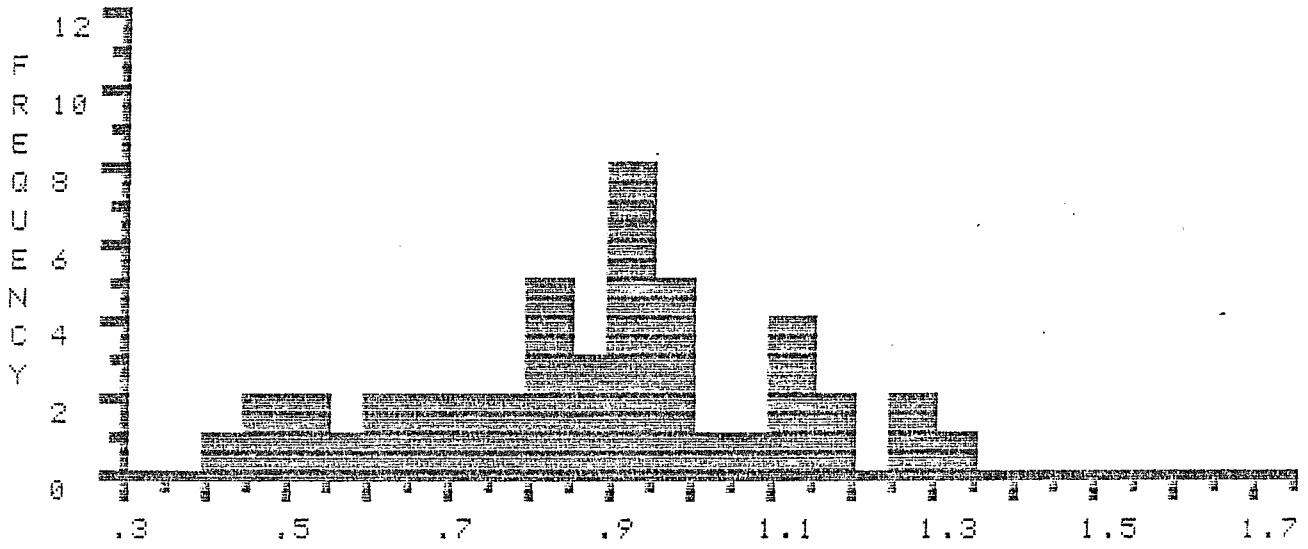


FILE >> K05578 DESCRIPTION FOLLOWS :
DEPTH 4330-4340M, BLUE H-28, MIKE AVERY, SEPT-24-85

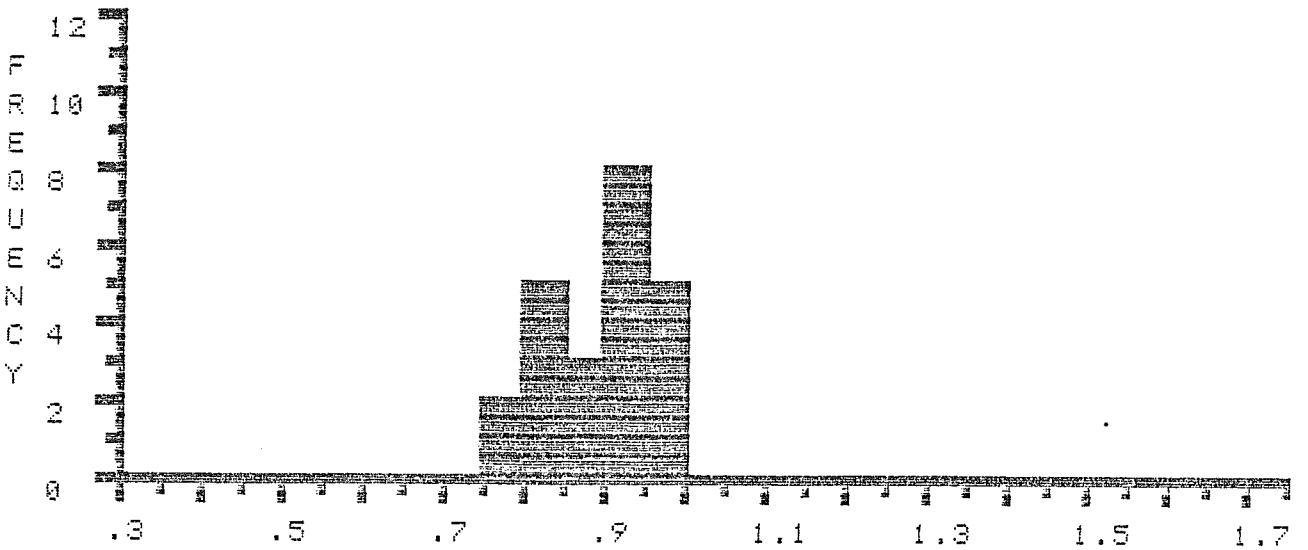
COL>	0	1	2	3	4	5	6	7	8	9
ROW		.42	.48	.49	.5	.51	.58	.61	.62	.65
1	.66	.72	.74	*.77	*.77	*.8	*.82	*.83	*.83	*.84
2	*.87	*.88	*.89	*.9	*.91	*.91	*.92	*.93	*.93	*.94
3	*.94	*.95	*.95	*.96	*.96	*.98	1.04	1.06	1.11	1.11
4	1.13	1.13	1.17	1.17	1.25	1.27	1.34			

	SUM	NUMBER	MIN	MAX	MEAN	STAND.DEV.
TOTAL >	40.24	46	.42	1.34	.87	.22
*EDIT >	20.48	23	.77	.98	.89	.06

% R E F L E C T A N C E



% R E F L E C T A N C E * * EDITED * *

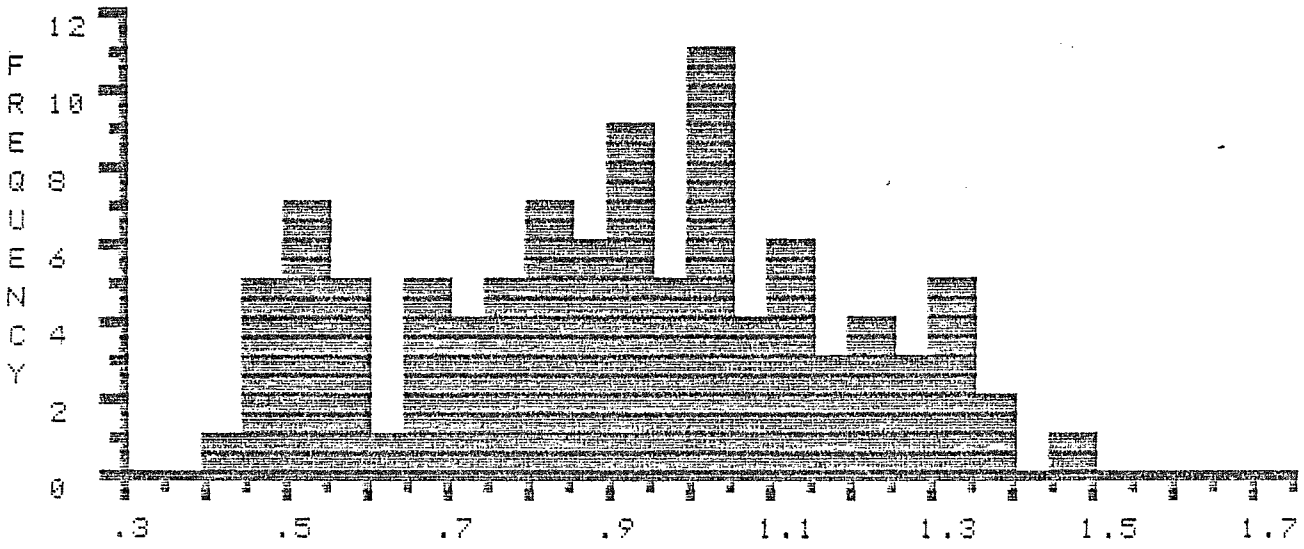


FILE >> K0557C DESCRIPTION FOLLOWS :
DEPTH 4480-4490M, BLUE H-28, MIKE AVERY, SEPT-24-85

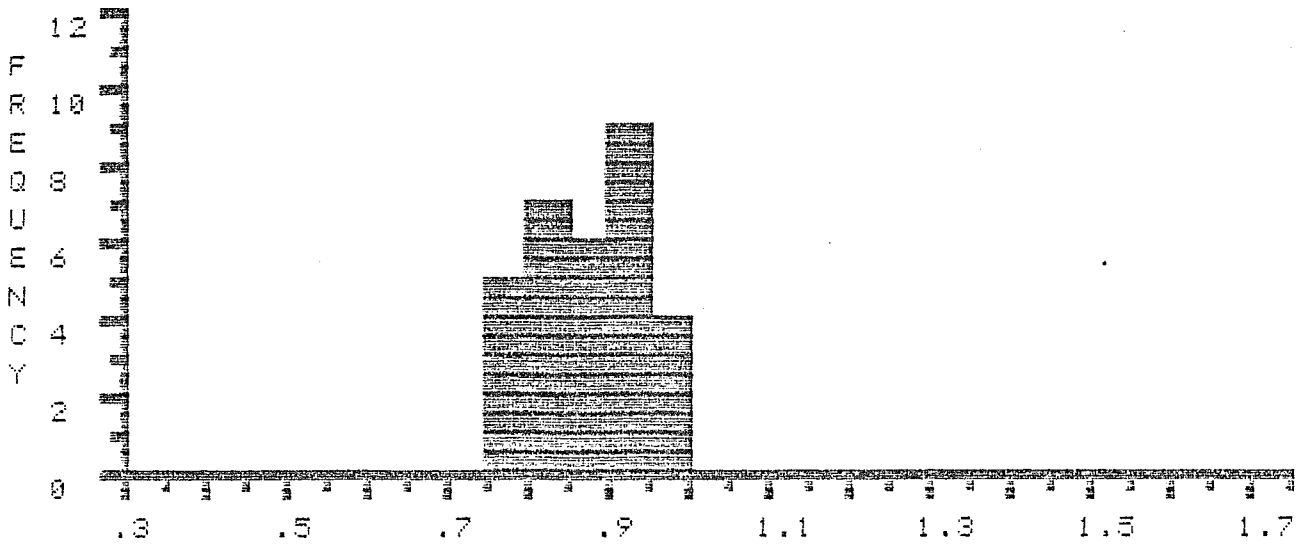
COL>	0	1	2	3	4	5	6	7	8	9
ROW		.44	.46	.47	.49	.49	.49	.51	.51	.51
1	.51	.51	.53	.54	.55	.56	.56	.56	.59	.61
2	.65	.66	.68	.69	.69	.71	.71	.71	.71	*.75
3	*.76	*.76	*.77	*.79	*.81	*.82	*.83	*.83	*.83	*.84
4	*.84	*.87	*.88	*.88	*.88	*.88	*.89	*.91	*.91	*.91
5	*.92	*.93	*.94	*.94	*.94	*.94	*.95	*.95	*.96	*.96
6	.99	1	1	1	1.01	1.01	1.02	1.02	1.02	1.02
7	1.03	1.04	1.05	1.06	1.08	1.09	1.11	1.11	1.11	1.12
8	1.13	1.13	1.15	1.18	1.19	1.2	1.21	1.22	1.22	1.25
9	1.26	1.26	1.3	1.3	1.3	1.32	1.34	1.37	1.37	1.46

	SUM	NUMBER	MIN	MAX	MEAN	STAND.DEV.
TOTAL >	89.22	99	.44	1.46	.9	.26
*EDIT >	27.07	31	.75	.96	.87	.07

% R E F L E C T A N C E



% R E F L E C T A N C E * * EDITED * *

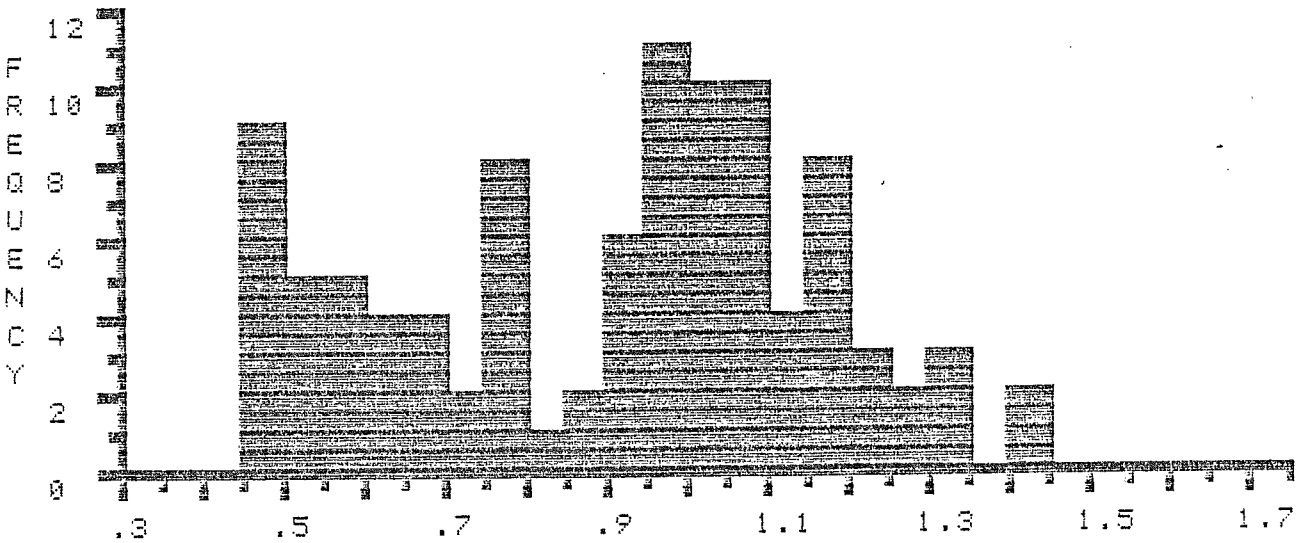


FILE >> K0558A DESCRIPTION FOLLOWS :
DEPTH 4690-4700M, BLUE H-28, MIKE AVERY, SEPT-29-85

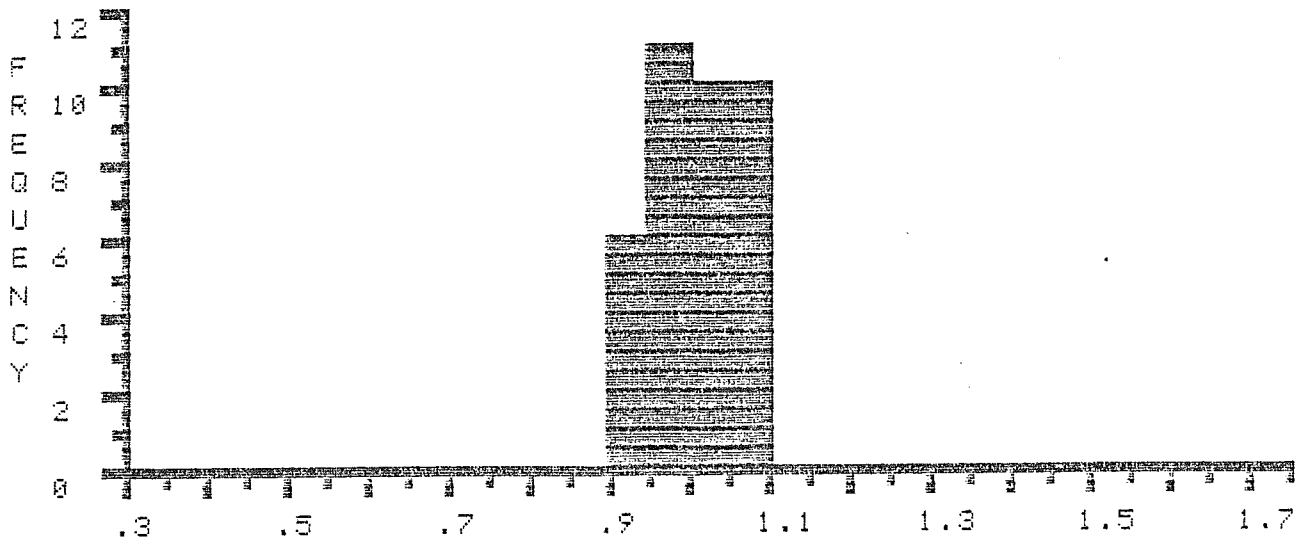
COL>	0	1	2	3	4	5	6	7	8	9
ROW		.45	.46	.46	.47	.48	.48	.48	.48	.49
1	.53	.53	.53	.54	.54	.55	.55	.57	.58	.58
2	.61	.62	.64	.64	.66	.68	.69	.69	.72	.74
3	.75	.77	.77	.78	.78	.78	.79	.79	.82	.85
4	.87	*.91	*.91	*.91	*.92	*.92	*.94	*.95	*.95	*.95
5	*.95	*.97	*.97	*.98	*.98	*.99	*.99	*.99	*1	*1.01
6	*1.01	*1.02	*1.02	*1.02	*1.03	*1.03	*1.03	*1.04	*1.05	*1.05
7	*1.05	*1.05	*1.06	*1.07	*1.07	*1.07	*1.08	*1.08	1.11	1.11
8	1.11	1.13	1.15	1.15	1.15	1.17	1.18	1.19	1.19	1.19
9	1.2	1.23	1.24	1.24	1.29	1.32	1.33		1.43	1.44

	SUM	NUMBER	MIN	MAX	MEAN	STAND.DEV.
TOTAL >	89.11	99	.45	1.44	.9	.26
*EDIT >	37.02	37	.91	1.08	1	.05

% R E F L E C T A N C E



% R E F L E C T A N C E * * EDITED * *

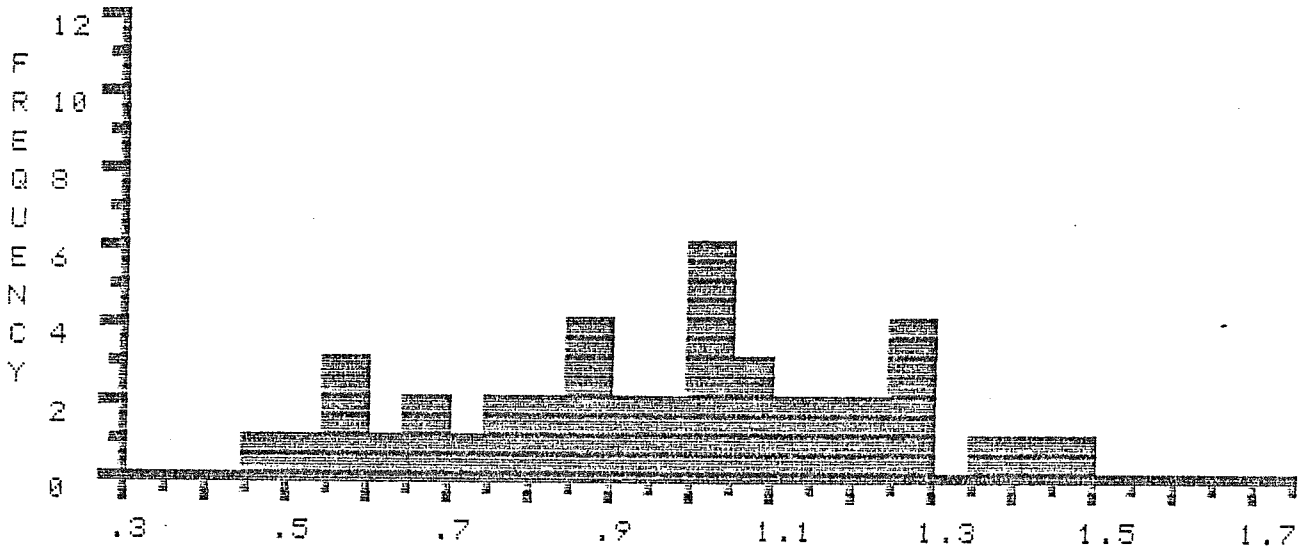


FILE >> K05588 DESCRIPTION FOLLOWS :
DEPTH 4770-4780M, BLUE H-28, MIKE AVERY, SEPT-28-85

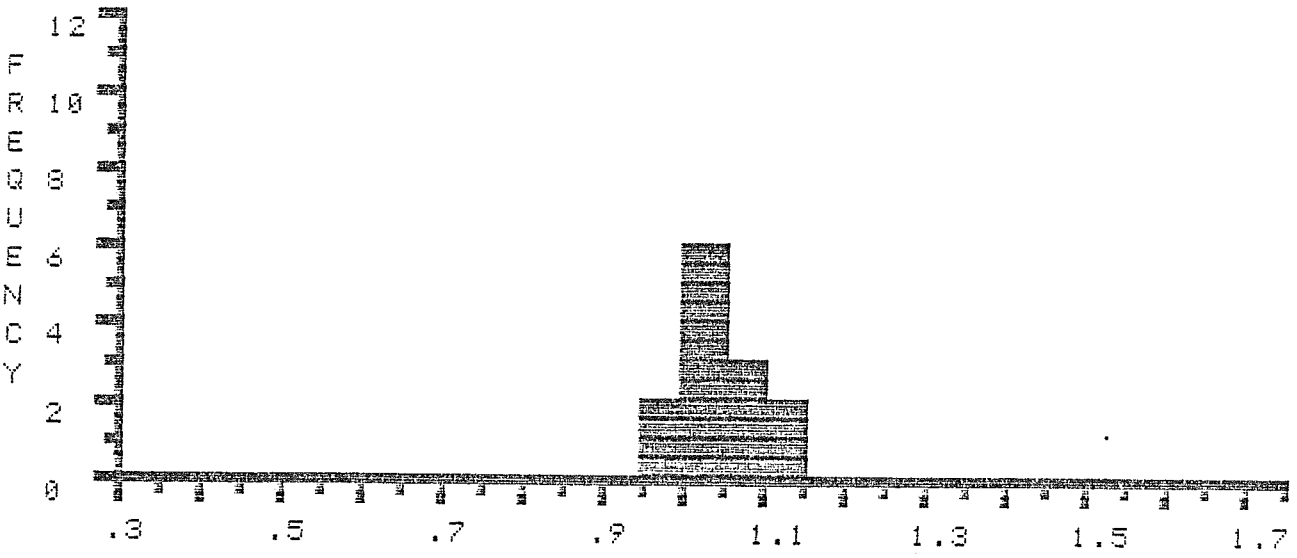
COL>	0	1	2	3	4	5	6	7	8	9
ROW		.48	.53	.55	.57	.57	.61	.67	.69	.73
1	.77	.79	.82	.82	.86	.87	.89	.89	.91	.93
2	*.95	*.99	*1	*1.01	*1.02	*1.03	*1.04	*1.04	*1.07	*1.07
3	*1.08	*1.11	*1.11	1.16	1.16	1.21	1.22	1.26	1.26	1.27
4	1.27	1.37	1.41	1.47						

	SUM	NUMBER	MIN	MAX	MEAN	STAND.DEV.
TOTAL >	41.53	43	.48	1.47	.97	.25
*EDIT >	13.52	13	.95	1.11	1.04	.05

% R E F L E C T A N C E



% R E F L E C T A N C E * * EDITED * *

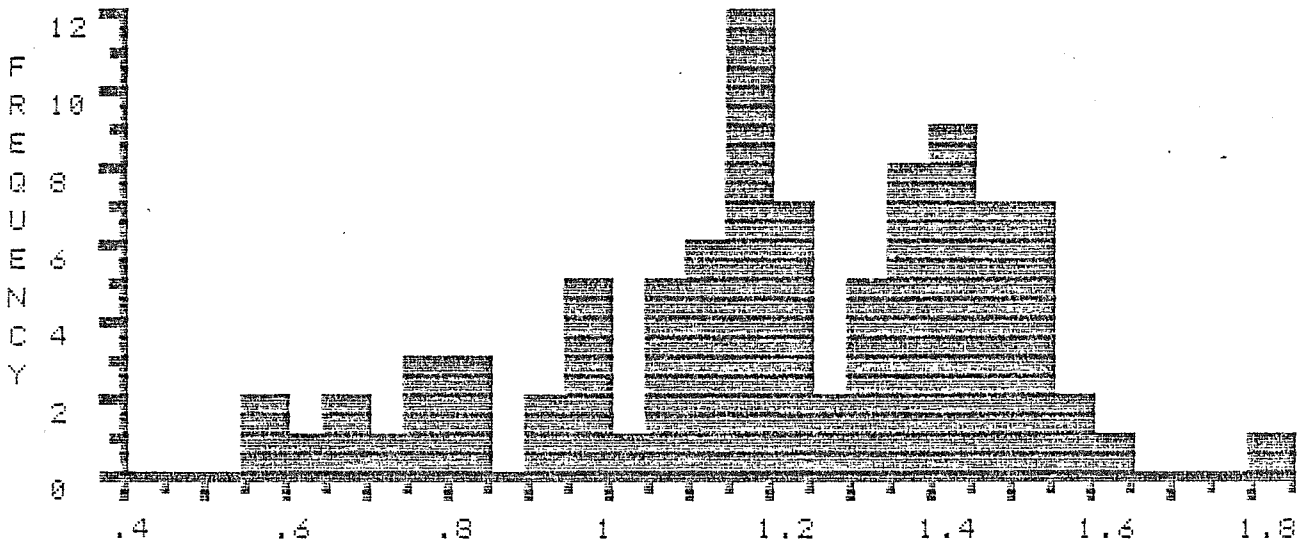


FILE >> K0558C DESCRIPTION FOLLOWS :
DEPTH 4930-4940M, BLUE H-28, MIKE AVERY, SEPT-28-85

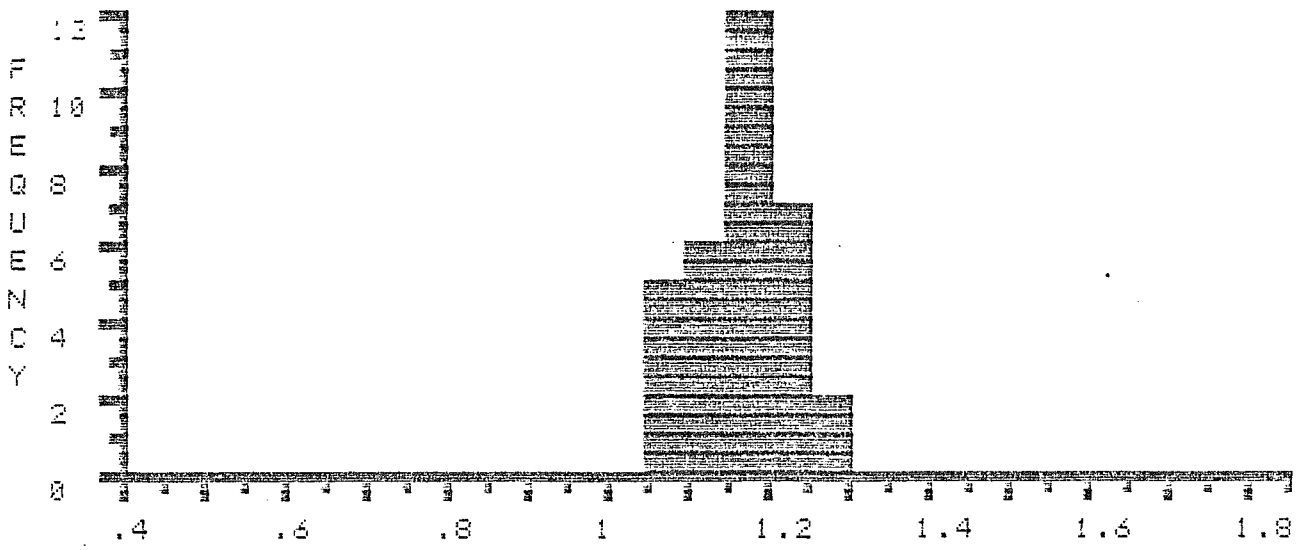
COL>	0	1	2	3	4	5	6	7	8	9
ROW		.55	.58	.63	.65	.66	.73	.75	.75	.76
1	.82	.84	.84	.93	.94	.95	.97	.98	.98	.99
2	1.01	*1.05	*1.06	*1.08	*1.09	*1.09	*1.12	*1.12	*1.13	*1.13
3	*1.14	*1.14	*1.15	*1.15	*1.15	*1.15	*1.16	*1.17	*1.18	*1.18
4	*1.18	*1.19	*1.19	*1.19	*1.21	*1.22	*1.22	*1.22	*1.23	*1.23
5	*1.24	*1.25	*1.26	1.31	1.31	1.32	1.33	1.34	1.35	1.35
6	1.36	1.36	1.37	1.38	1.39	1.39	1.4	1.41	1.41	1.41
7	1.42	1.43	1.43	1.44	1.44	1.45	1.45	1.47	1.48	1.48
8	1.49	1.49	1.5	1.51	1.51	1.52	1.52	1.52	1.53	1.56
9	1.59	1.64	1.82							

	SUM	NUMBER	MIN	MAX	MEAN	STAND.DEV.
TOTAL >	111.46	92	.55	1.82	1.21	.26
*EDIT >	37.27	32	1.05	1.26	1.16	.06

% R E F L E C T A N C E



% R E F L E C T A N C E * * EDITED * *

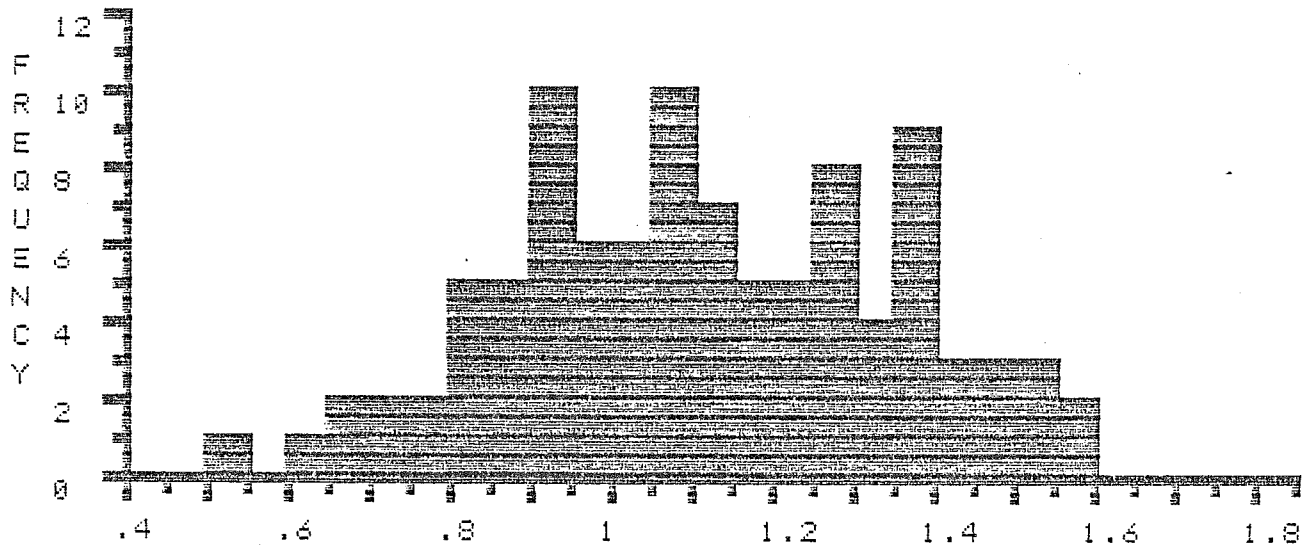


FILE >> K0559A DESCRIPTION FOLLOWS :
DEPTH 5070-5080M, BLUE H-28, MIKE AVERY, SEPT-28-85

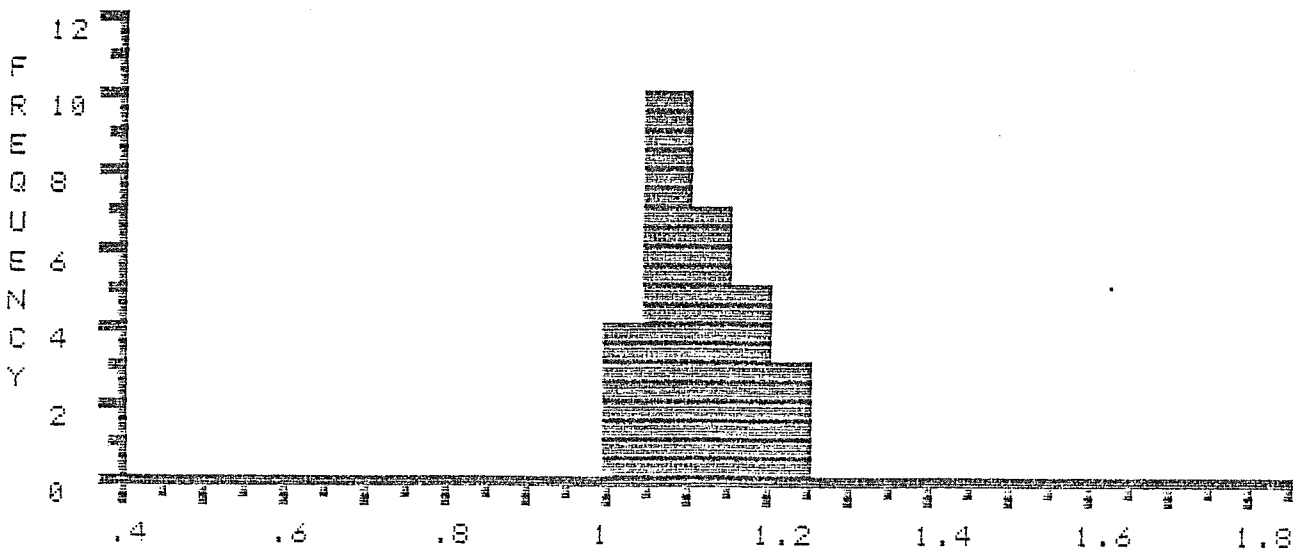
COL>	0	1	2	3	4	5	6	7	8	9
ROW		.52	.64	.68	.68	.71	.71	.75	.77	.8
1	.81	.82	.82	.82	.86	.88	.88	.89	.89	.9
2	.9	.9	.91	.92	.93	.93	.94	.94	.94	.95
3	.96	.97	.97	.98	.99	1	1	*1.03	*1.03	*1.04
4	*1.04	*1.05	*1.06	*1.07	*1.07	*1.08	*1.08	*1.08	*1.08	*1.08
5	*1.09	*1.1	*1.11	*1.12	*1.13	*1.13	*1.14	*1.14	*1.15	*1.16
6	*1.18	*1.19	*1.19	*1.2	*1.2	*1.21	1.24	1.24	1.25	1.25
7	1.26	1.28	1.28	1.29	1.29	1.29	1.3	1.3	1.3	1.34
8	1.35	1.37	1.37	1.38	1.38	1.38	1.39	1.39	1.39	1.4
9	1.4	1.44	1.45	1.46	1.47	1.5	1.51	1.51	1.59	1.59

	SUM	NUMBER	MIN	MAX	MEAN	STAND.DEV.
TOTAL >	109.82	99	.52	1.59	1.11	.24
*EDIT >	32.23	29	1.03	1.21	1.11	.06

% R E F L E C T A N C E



% R E F L E C T A N C E * * EDITED * *

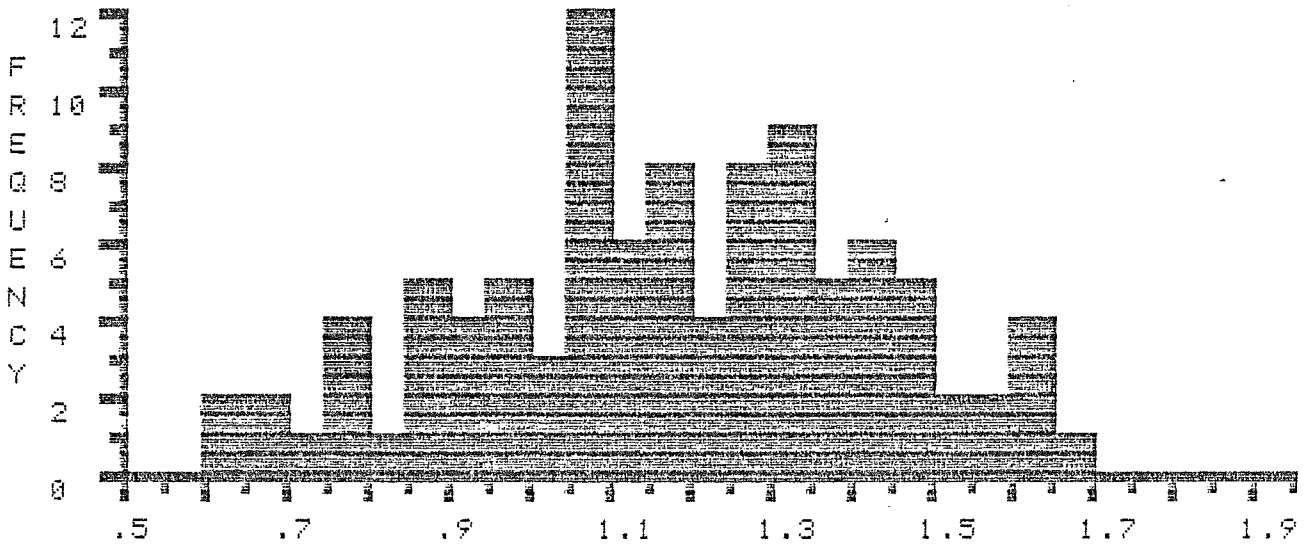


FILE >> K05598 DESCRIPTION FOLLOWS :
DEPTH 5230-5240M, BLUE H-29, MIKE AVERY, SEPT-28-85

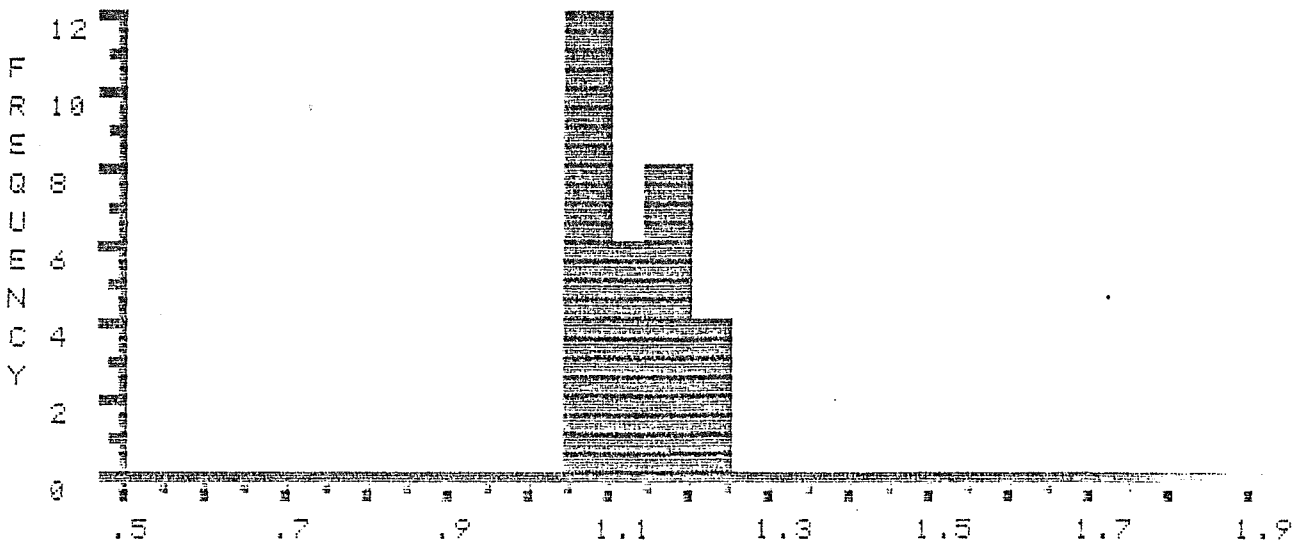
COL>	0	1	2	3	4	5	6	7	8	9
ROW		.62	.64	.66	.67	.74	.76	.78	.78	.79
1	.83	.85	.86	.87	.88	.89	.91	.91	.93	.93
2	.96	.97	.98	.98	.99	1.01	1.01	1.02	*1.05	*1.05
3	*1.06	*1.06	*1.07	*1.07	*1.07	*1.08	*1.08	*1.08	*1.09	*1.09
4	*1.1	*1.11	*1.12	*1.12	*1.13	*1.13	*1.15	*1.15	*1.16	*1.16
5	*1.19	*1.19	*1.19	*1.19	*1.2	*1.2	*1.21	*1.23	1.25	1.25
6	1.26	1.27	1.27	1.27	1.29	1.29	1.3	1.31	1.31	1.31
7	1.31	1.32	1.33	1.33	1.34	1.35	1.37	1.37	1.38	1.39
8	1.41	1.43	1.43	1.43	1.44	1.44	1.46	1.46	1.46	1.47
9	1.49	1.5	1.51	1.58	1.59	1.6	1.6	1.6	1.6	1.67

	SUM	NUMBER	MIN	MAX	MEAN	STAND.DEV.
TOTAL >	116.04	99	.62	1.67	1.17	.25
*EDIT >	33.78	30	1.05	1.23	1.13	.06

% R E F L E C T A N C E



% R E F L E C T A N C E * * EDITED * *

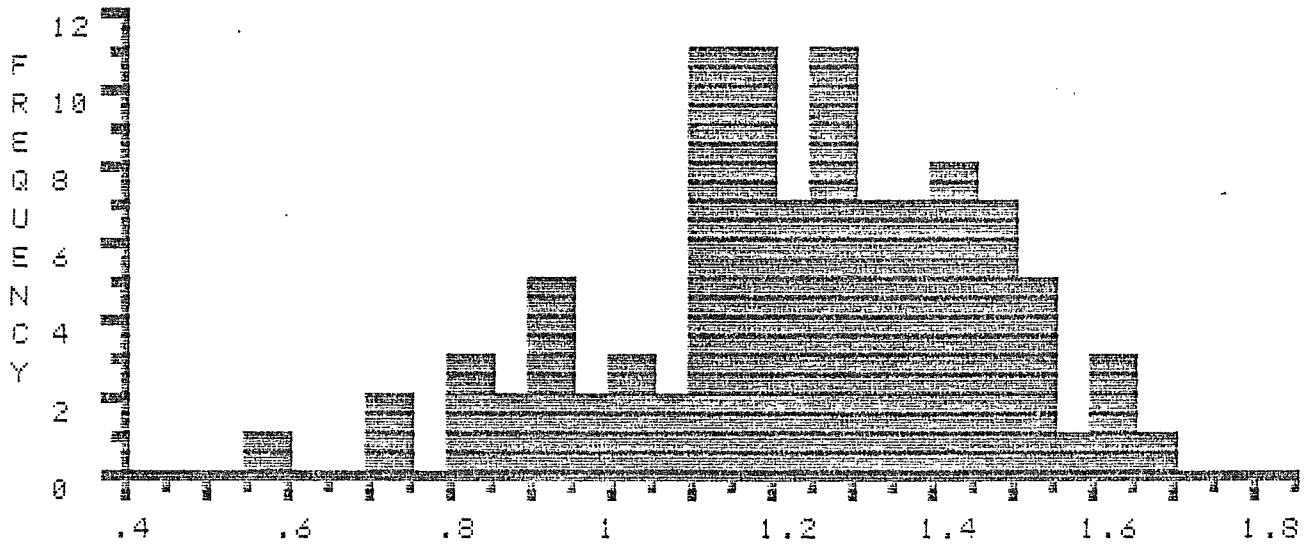


FILE >> K0559C DESCRIPTION FOLLOWS :
DEPTH 5400-5410M, BLUE H-28, MIKE AVERY, SEPT-28-85

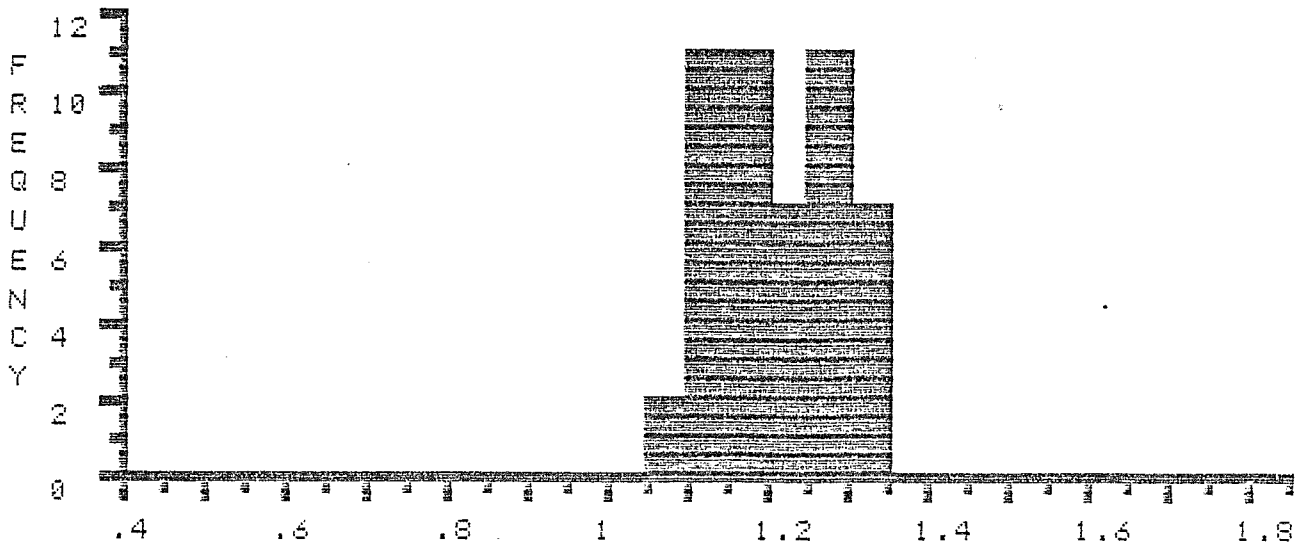
COL>	0	1	2	3	4	5	6	7	8	9
ROW		.59	.7	.74	.8	.8	.84	.87	.89	.9
1	.9	.92	.92	.93	.99	.99	1	1.03	1.04	*1.07
2	*1.08	*1.1	*1.1	*1.1	*1.11	*1.12	*1.13	*1.13	*1.14	*1.14
3	*1.14	*1.14	*1.15	*1.15	*1.15	*1.15	*1.15	*1.15	*1.16	*1.16
4	*1.16	*1.16	*1.19	*1.2	*1.2	*1.22	*1.22	*1.22	*1.24	*1.24
5	*1.25	*1.25	*1.25	*1.25	*1.25	*1.25	*1.27	*1.27	*1.27	*1.28
6	*1.29	*1.3	*1.31	*1.31	*1.32	*1.33	*1.34	*1.34	1.35	1.35
7	1.35	1.36	1.36	1.38	1.39	1.4	1.4	1.41	1.42	1.43
8	1.43	1.44	1.44	1.45	1.45	1.45	1.46	1.47	1.49	1.49
9	1.5	1.51	1.52	1.52	1.54	1.55	1.6	1.62	1.64	1.66

	SUM	NUMBER	MIN	MAX	MEAN	STAND.DEV.
TOTAL >	121.58	99	.59	1.66	1.23	.22
*EDIT >	58.9	49	1.07	1.34	1.2	.08

% R E F L E C T A N C E



% R E F L E C T A N C E * * EDITED * *

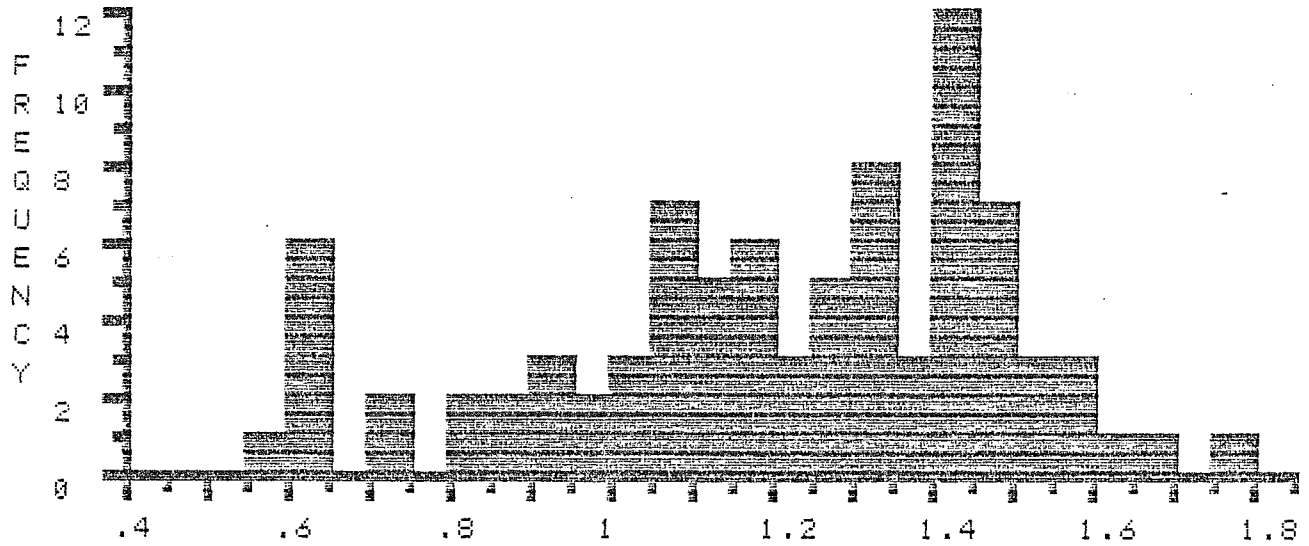


FILE >> K0560A DESCRIPTION FOLLOWS :
DEPTH 5530-5540M, BLUE H-28, MIKE AVERY, SEPT-28-85

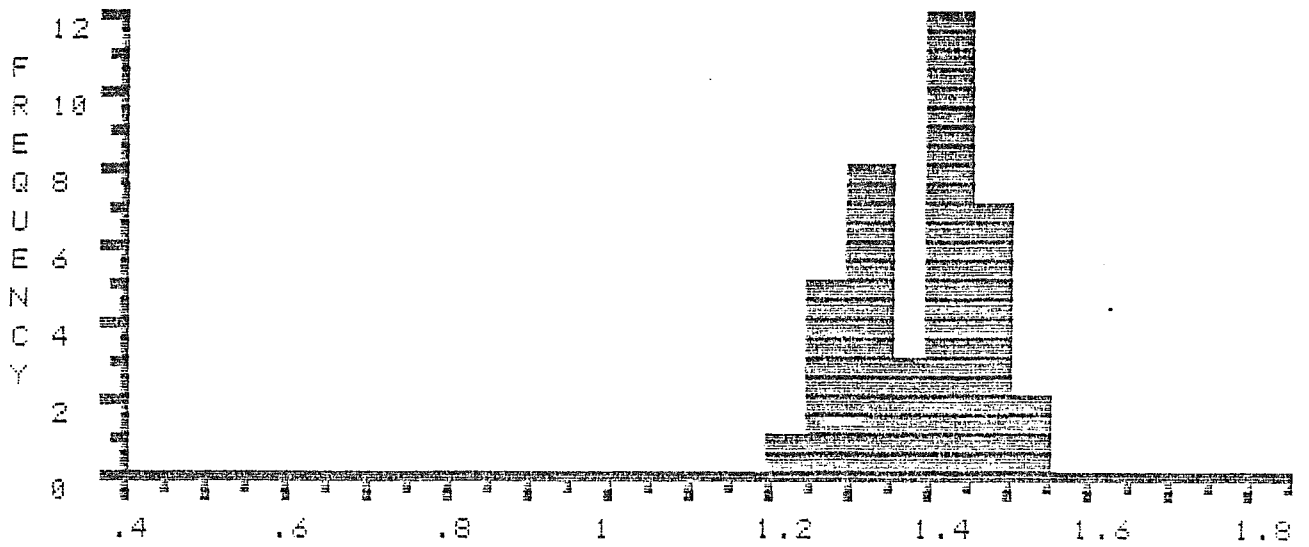
COL>	0	1	2	3	4	5	6	7	8	9
ROW		.58	.6	.6	.62	.62	.62	.64	.7	.72
1	.83	.83	.88	.89	.92	.93	.94	.95	.96	1.02
2	1.03	1.03	1.05	1.05	1.05	1.07	1.08	1.09	1.09	1.1
3	1.1	1.12	1.12	1.14	1.15	1.15	1.17	1.18	1.19	1.19
4	1.21	1.21	*1.24	*1.26	*1.26	*1.27	*1.27	*1.27	*1.31	*1.31
5	*1.31	*1.33	*1.34	*1.34	*1.34	*1.34	*1.35	*1.35	*1.38	*1.41
6	*1.41	*1.41	*1.41	*1.42	*1.42	*1.42	*1.43	*1.43	*1.44	*1.44
7	*1.44	*1.45	*1.45	*1.46	*1.46	*1.48	*1.48	*1.49	*1.51	*1.51
8	1.54	1.55	1.56	1.56	1.61	1.69	1.76			

	SUM	NUMBER	MIN	MAX	MEAN	STAND.DEV.
TOTAL >	103.33	86	.58	1.76	1.2	.28
*EDIT >	52.64	38	1.24	1.51	1.39	.08

% R E F L E C T A N C E



% R E F L E C T A N C E * * EDITED * *

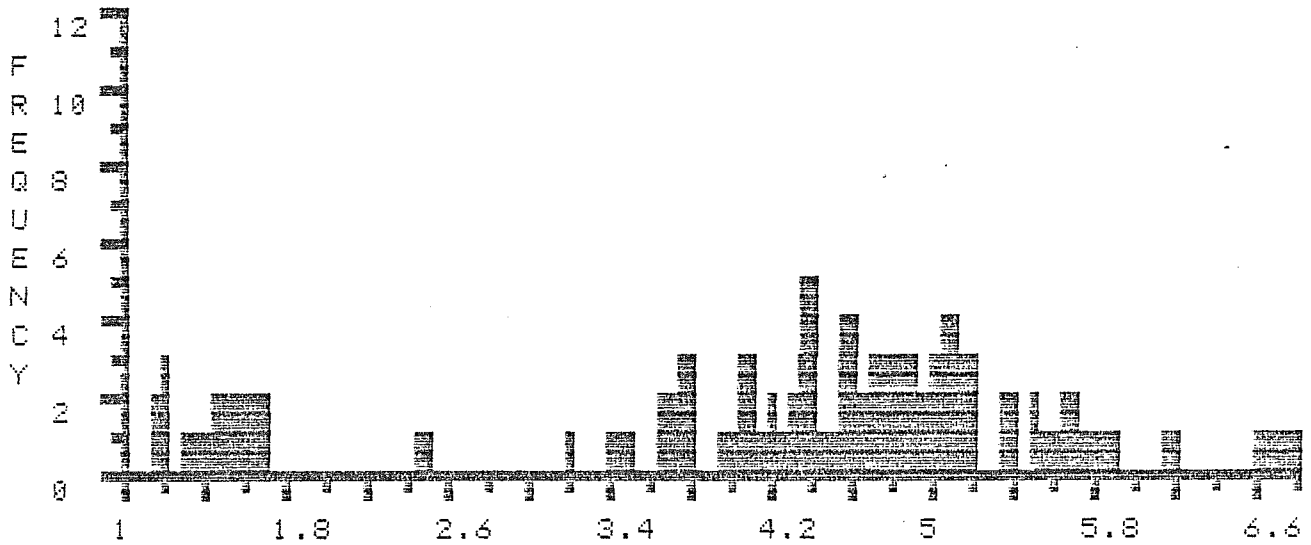


FILE >> K05608 DESCRIPTION FOLLOWS :
DEPTH 5690-5700M, BLUE H-28, MIKE AVERY, SEPT-28-85

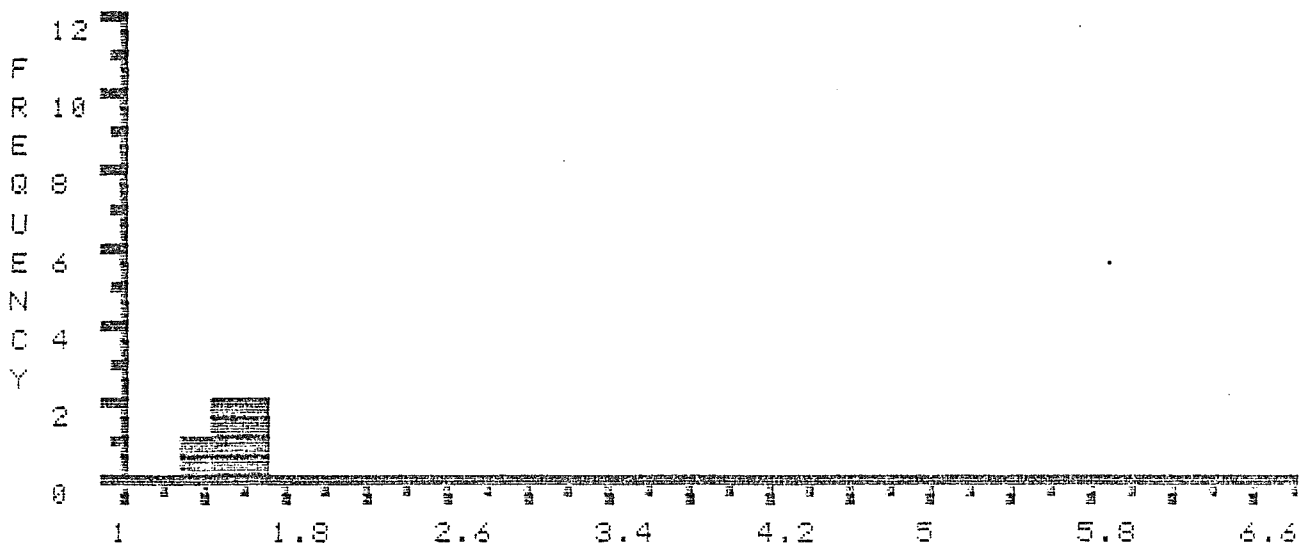
COL>	0	1	2	3	4	5	6	7	8	9
ROW		1.18	1.18	1.2	1.22	1.22	*1.32	*1.35	*1.41	*1.46
1	*1.48	*1.5	*1.53	*1.57	*1.59	*1.63	*1.67	*1.67	*1.74	2.49
2	3.21	3.41	3.48	3.52	3.67	3.68	3.76	3.74	3.79	3.8
3	3.81	3.96	4.08	4.08	4.09	4.19	4.23	4.23	4.26	4.32
4	4.33	4.37	4.37	4.37	4.38	4.39	4.41	4.41	4.48	4.52
5	4.56	4.56	4.57	4.58	4.6	4.62	4.67	4.69	4.73	4.73
6	4.74	4.78	4.78	4.79	4.82	4.84	4.84	4.85	4.85	4.89
7	4.9	4.97	4.97	5	5.03	5.03	5.05	5.06	5.07	5.09
8	5.1	5.14	5.17	5.18	5.19	5.35	5.39	5.5	5.53	5.59
9	5.65	5.67	5.7	5.75	5.87	6.18	6.6	6.68	6.71	6.77

	SUM	NUMBER	MIN	MAX	MEAN	STAND.DEV.
TOTAL >	409.14	99	1.18	6.77	4.13	1.47
*EDIT >	19.92	13	1.32	1.74	1.53	.13

% R E F L E C T A N C E



% R E F L E C T A N C E * * EDITED * *

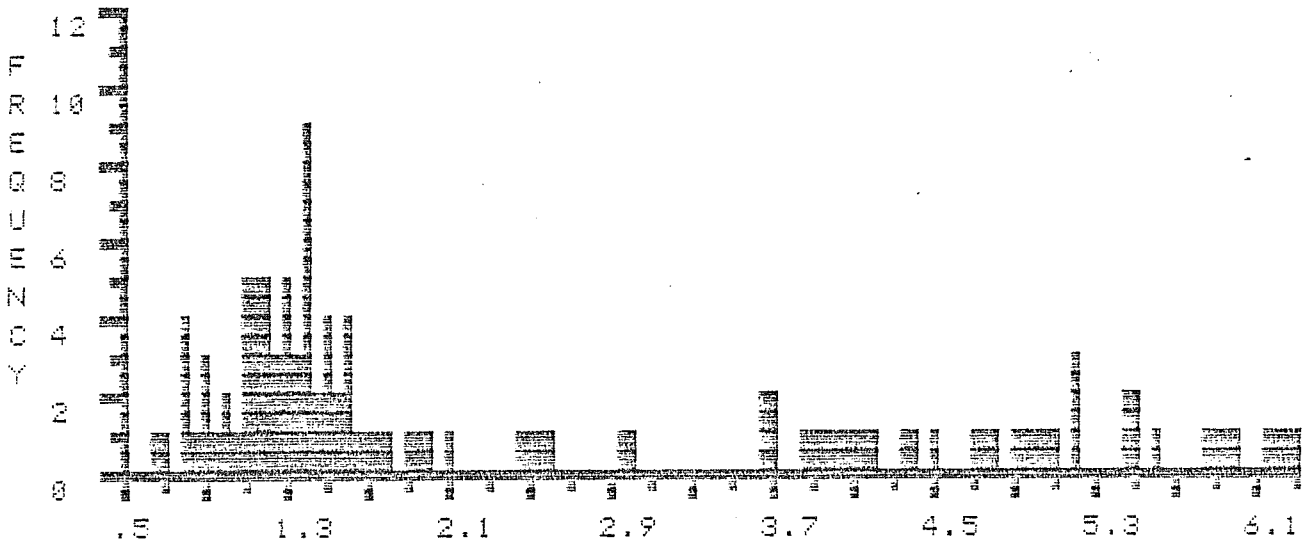


FILE >> K0560C DESCRIPTION FOLLOWS :
DEPTH 5830-5840M. BLUE H-38. MIKE AVERY. DEC-7-85

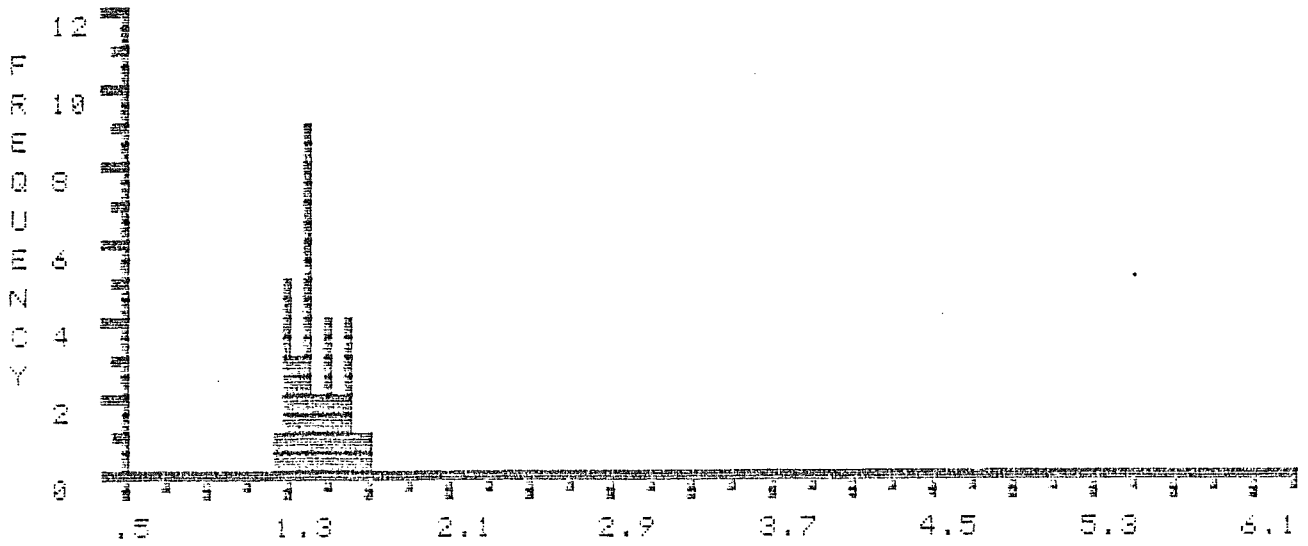
COL>	0	1	2	3	4	5	6	7	8	9
ROW		.68	.7	.8	.91	.83	.84	.88	.9	.93
1	.94	.96	1.03	1.04	1.09	1.11	1.14	1.14	1.14	1.14
2	1.16	1.17	1.18	1.19	1.19	1.2	1.21	1.22	1.22	1.23
3	1.25	1.26	*1.29	*1.31	*1.31	*1.32	*1.33	*1.34	*1.36	*1.37
4	*1.39	*1.4	*1.4	*1.41	*1.41	*1.41	*1.42	*1.42	*1.44	*1.44
5	*1.47	*1.48	*1.5	*1.5	*1.5	*1.53	*1.58	*1.58	*1.61	*1.62
6	*1.62	*1.64	*1.65	1.72	1.77	1.82	1.9	1.97	2.14	2.45
7	2.59	2.96	3.65	3.66	3.86	3.92	3.99	4.05	4.18	4.37
8	4.53	4.74	4.76	4.94	4.97	5.01	5.06	5.2	5.2	5.24
9	5.45	5.45	5.62	5.89	5.98	6.03	6.16	6.21	6.26	6.31

	SUM	NUMBER	MIN	MAX	MEAN	STAND.DEV.
TOTAL >	237.64	99	.68	6.31	2.4	1.75
*EDIT >	45.05	31	1.29	1.65	1.45	.11

% R E F L E C T A N C E



% R E F L E C T A N C E * * EDITED * *

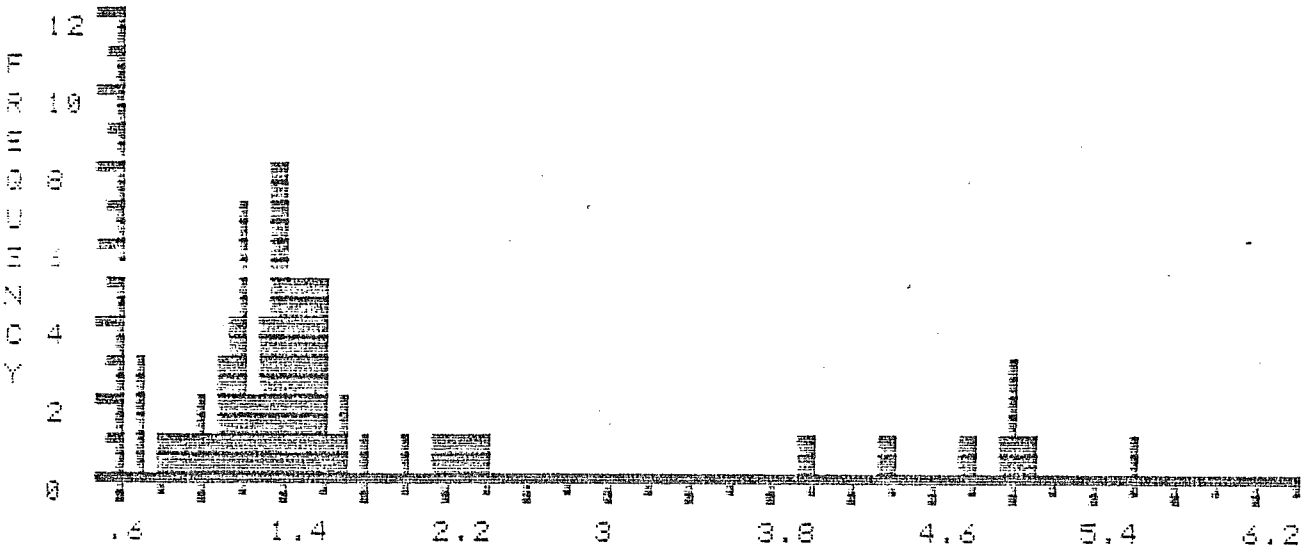


FILE >> K0561A DESCRIPTION FOLLOWS :
DEPTH 5970-5980M, BLUE H-28, MIKE AVERY, DEC-7-85

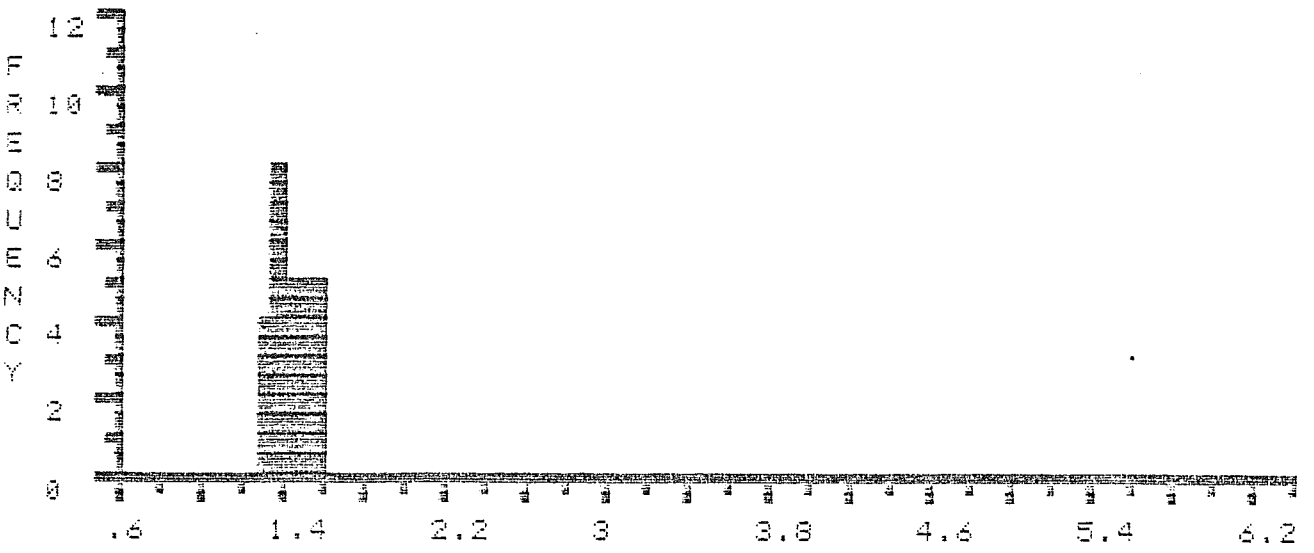
COL>	0	1	2	3	4	5	6	7	8	9
ROW		.72	.74	.74	.84	.87	.92	.96	1	1.02
1	1.06	1.12	1.13	1.14	1.16	1.18	1.18	1.19	1.2	1.21
2	1.22	1.22	1.24	1.24	1.24	1.26	1.27	*1.3	*1.3	*1.32
3	*1.33	*1.37	*1.37	*1.37	*1.37	*1.38	*1.38	*1.38	*1.39	*1.41
4	*1.42	*1.42	*1.43	*1.43	*1.43	*1.44	*1.45	*1.46	*1.46	*1.47
5	*1.49	*1.5	*1.52	*1.52	*1.55	*1.55	*1.56	*1.56	*1.58	*1.61
6	1.66	1.71	1.72	1.84	2.02	2.17	2.27	2.39	3.99	4.38
7	4.78	4.96	5.01	5.03	5.04	5.05	5.63			

	SUM	NUMBER	MIN	MAX	MEAN	STAND.DEV.
TOTAL >	135.24	76	.72	5.63	1.78	1.19
*EDIT >	47.52	38	1.3	1.61	1.44	.08

% R E F L E C T A N C E



% R E F L E C T A N C E * * EDITED * *

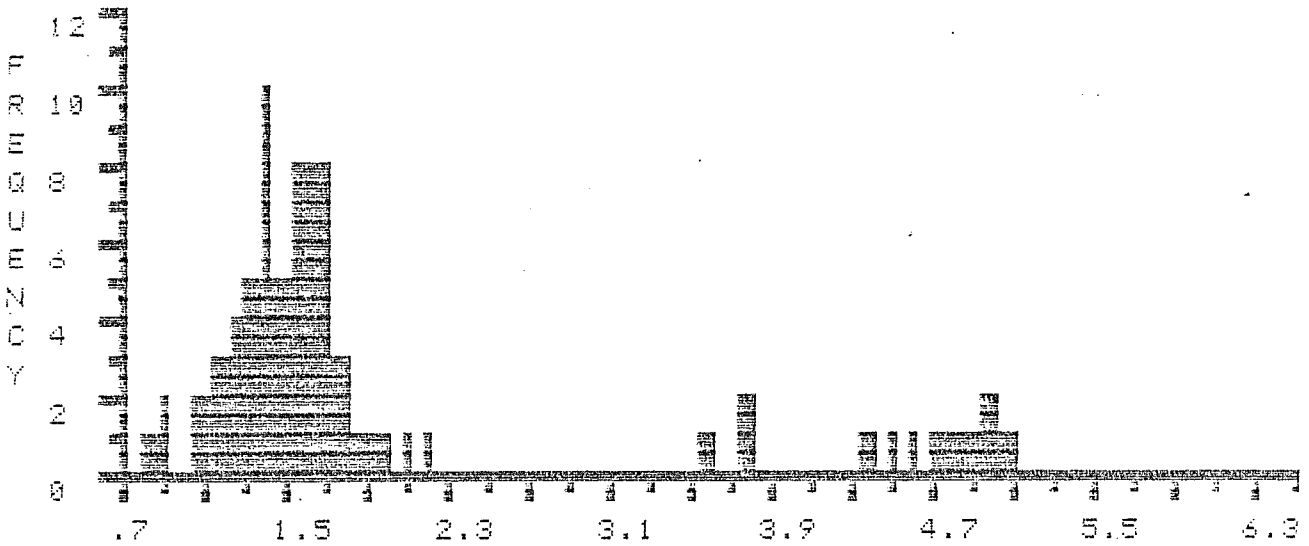


FILE >> K0561B DESCRIPTION FOLLOWS :
DEPTH 6090-6100M, BLUE H-28, MIKE AVERY, DEC-7-85

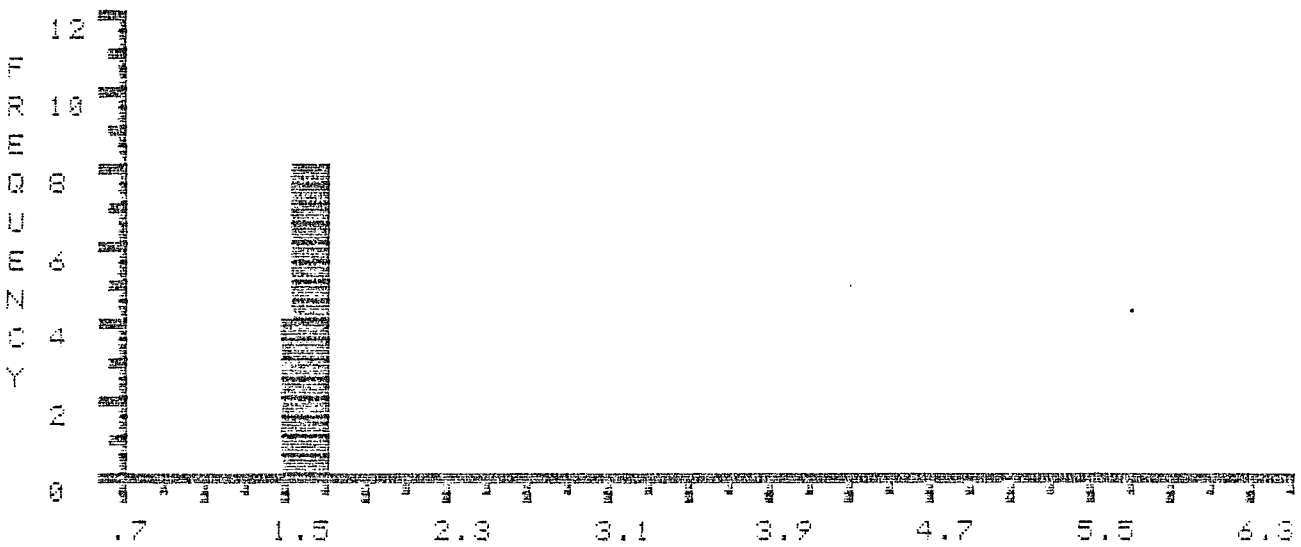
COL>	0	1	2	3	4	5	6	7	8	9
ROW		.84	.88	.91	.94	1.06	1.08	1.14	1.18	1.19
1	1.23	1.24	1.25	1.27	1.28	1.29	1.31	1.32	1.33	1.33
2	1.34	1.35	1.37	1.38	1.38	1.39	1.4	1.4	1.41	1.42
3	1.43	1.43	1.44	1.44	1.44	1.44	1.45	1.47	1.47	1.47
4	1.48	*1.5	*1.51	*1.54	*1.54	*1.55	*1.56	*1.57	*1.57	*1.57
5	*1.57	*1.58	*1.59	*1.61	*1.62	*1.62	*1.65	*1.66	*1.66	*1.66
6	*1.67	*1.69	*1.69	*1.69	1.72	1.72	1.74	1.76	1.76	1.77
7	1.8	1.82	1.83	1.86	1.93	1.95	2.12	2.22	3.59	3.77
8	3.79	4.35	4.54	4.6	4.7	4.78	4.86	4.96	4.97	5.07

	SUM	NUMBER	MIN	MAX	MEAN	STAND.DEV.
TOTAL >	168.74	89	.84	5.07	1.9	1.08
*EDIT >	36.87	23	1.5	1.69	1.6	.06

% R E F L E C T A N C E



% R E F L E C T A N C E * * EDITED * *



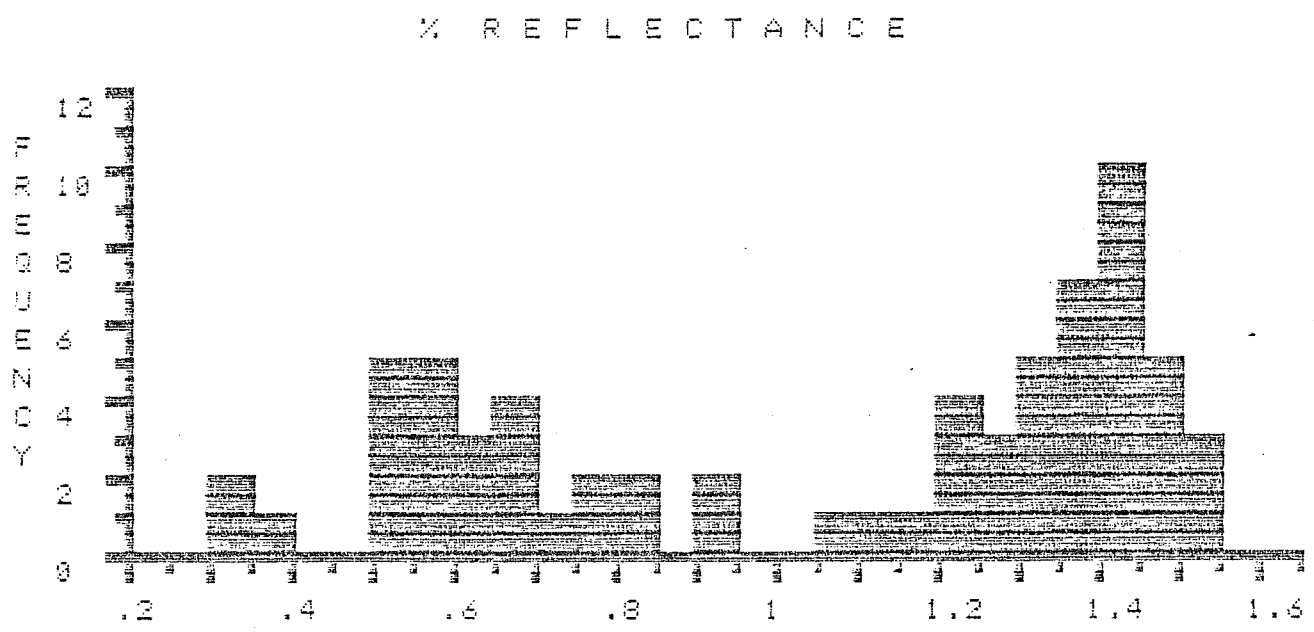
Vitrinite Reflectance Histograms

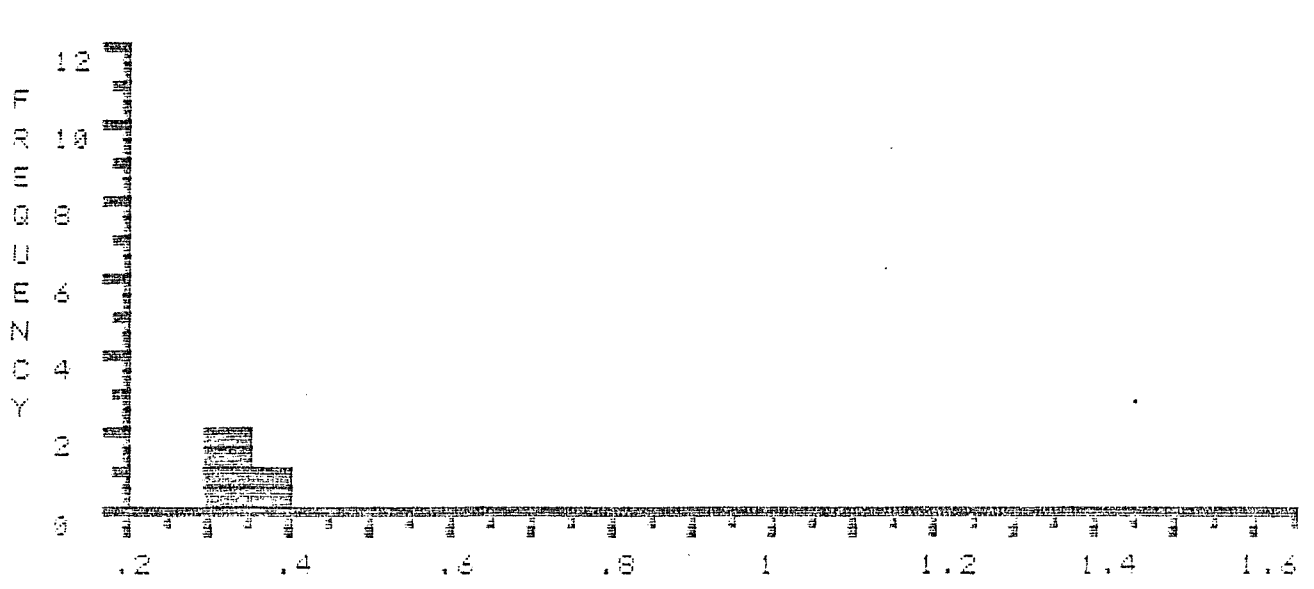
EDIT 2

FILE >> R0554A DESCRIPTION FOLLOWS :
DEPTH 2660-2670M, BLUE H-28, MIKE AVERY, AUG-31-85

COL>	0	1	2	3	4	5	6	7	8	9
ROW		*.3	*.33	*.38	.5	.5	.51	.53	.54	.56
1	.57	.57	.58	.59	.6	.6	.63	.65	.66	.68
2	.69	.74	.77	.78	.82	.83	.91	.94	1.06	1.11
3	1.15	1.21	1.24	1.24	1.24	1.25	1.25	1.28	1.31	1.32
4	1.33	1.34	1.34	1.35	1.35	1.36	1.36	1.36	1.37	1.37
5	1.4	1.41	1.41	1.41	1.42	1.42	1.42	1.43	1.43	1.43
6	1.45	1.46	1.46	1.46	1.46	1.5	1.51	1.51		

	SUM	NUMBER	MIN	MAX	MEAN	STAND.DEV.
TOTAL >	70.94	67	.3	1.51	1.06	.38
*EDIT >	1.01	3	.3	.38	.34	.04



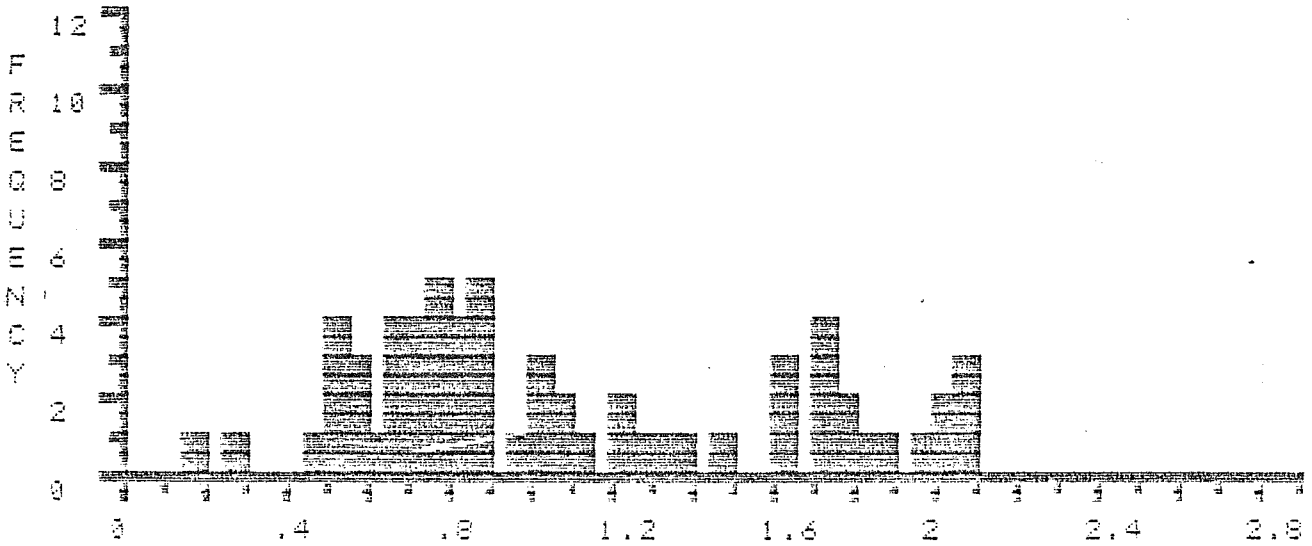


FILE >> K05548 DESCRIPTION FOLLOWS :
.DEPTH 2810-2820M, BLUE H-28, MIKE AVERY, AUG-31-85

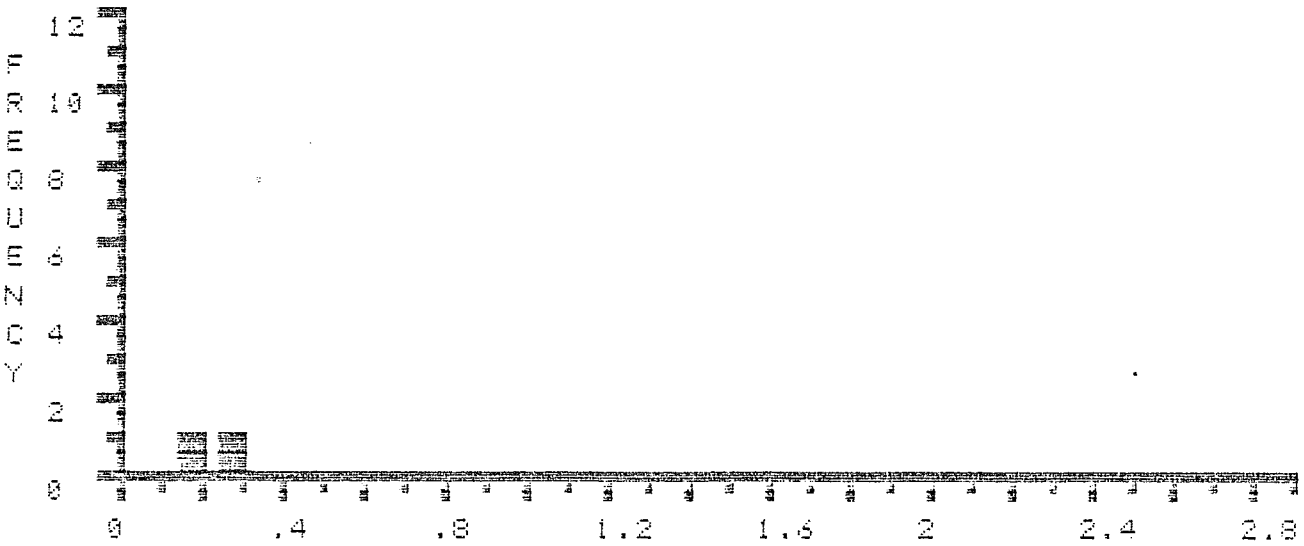
COL>	0	1	2	3	4	5	6	7	8	9
ROW		*.18	*.25	.49	.51	.51	.52	.53	.55	.56
1	.59	.64	.65	.68	.68	.69	.7	.72	.72	.74
2	.76	.77	.78	.79	.79	.81	.83	.83	.84	.85
3	.86	.88	.88	.88	.99	1.02	1.04	1.04	1.07	1.09
4	1.14	1.23	1.24	1.29	1.32	1.35	1.49	1.61	1.62	1.63
5	1.71	1.73	1.74	1.74	1.77	1.78	1.8	1.87	1.95	2
6	2.04	2.05	2.05	2.06						

	SUM	NUMBER	MIN	MAX	MEAN	STAND.DEV.
TOTAL >	68.92	63	.18	2.06	1.09	.52
*EDIT >	.43	2	.18	.25	.22	.05

% R E F L E C T A N C E



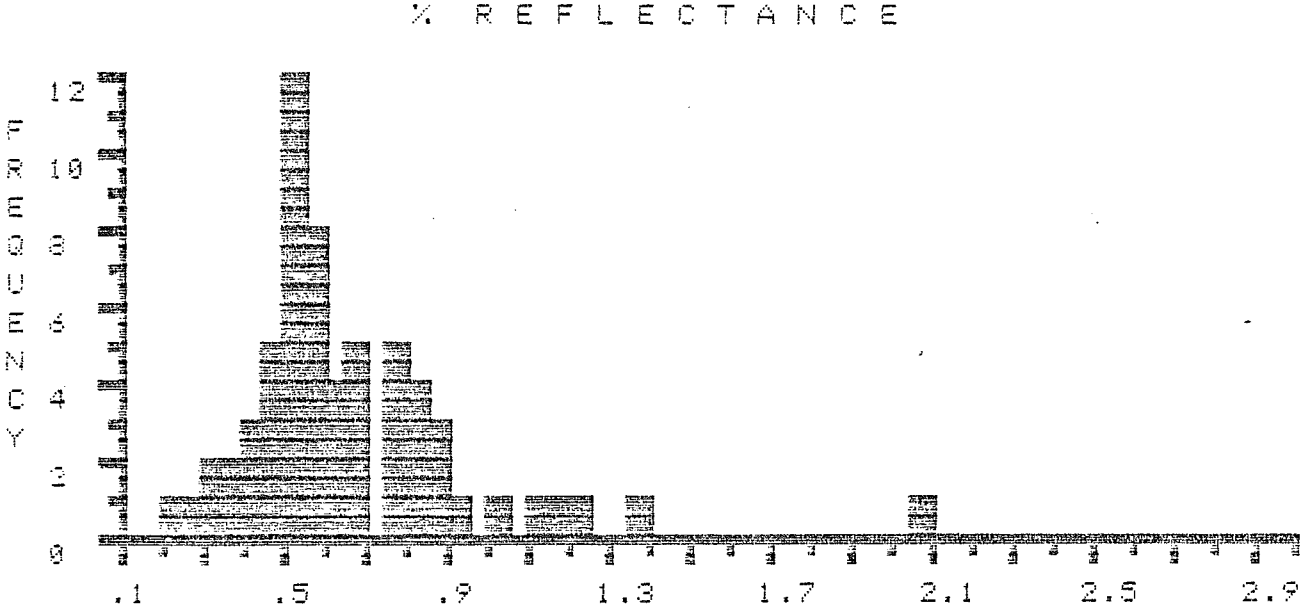
% R E F L E C T A N C E * * EDITED * *

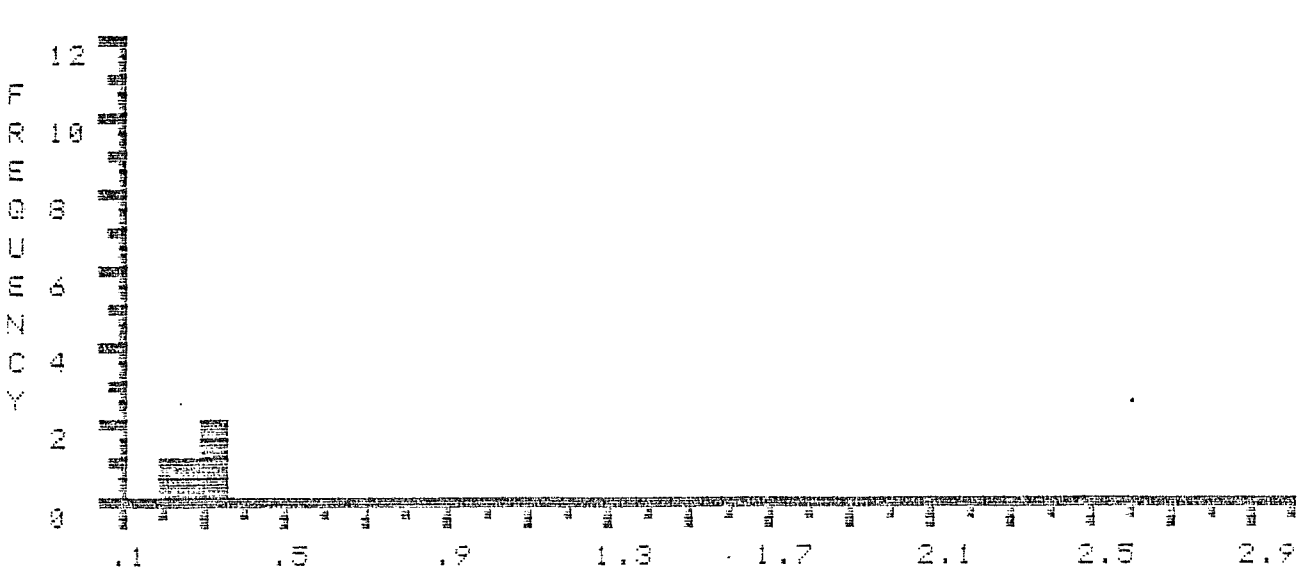


FILE >> K0554C DESCRIPTION FOLLOWS :
DEPTH 3010-3020M, BLUE H-28, MIKE AVERY, SEPT-7-85

COL>	0	1	2	3	4	5	6	7	8	9
ROW		*.21	*.29	*.31	*.33	.37	.39	.41	.43	.43
1	.45	.45	.46	.49	.49	.5	.5	.51	.51	.51
2	.52	.52	.53	.53	.53	.54	.54	.55	.55	.55
3	.56	.56	.56	.59	.59	.6	.6	.62	.63	.66
4	.68	.68	.69	.69	.75	.75	.76	.76	.78	.81
5	.82	.82	.84	.87	.88	.89	.91	1.04	1.12	1.16
6	1.21	1.38	2.07							

	SUM	NUMBER	MIN	MAX	MEAN	STAND.DEV.
TOTAL >	40.75	62	.21	2.07	.66	.29
*EDIT >	1.14	4	.21	.33	.29	.05



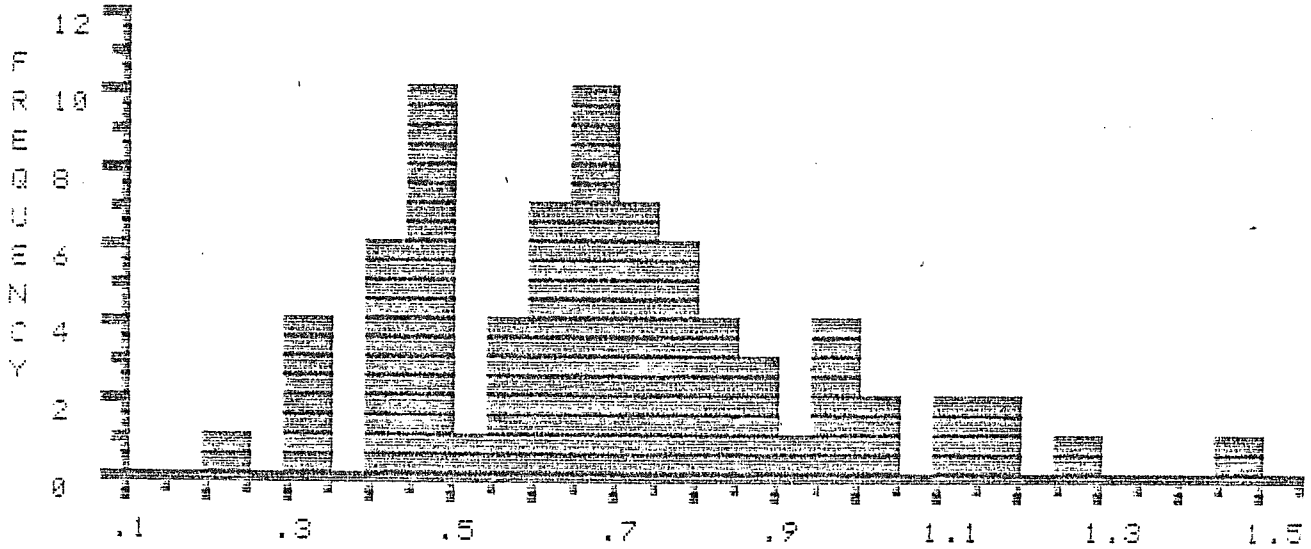


FILE >> K0555A DESCRIPTION FOLLOWS :
DEPTH 3130-3140M, BLUE H-28, MIKE AVERY, SEPT-7-85

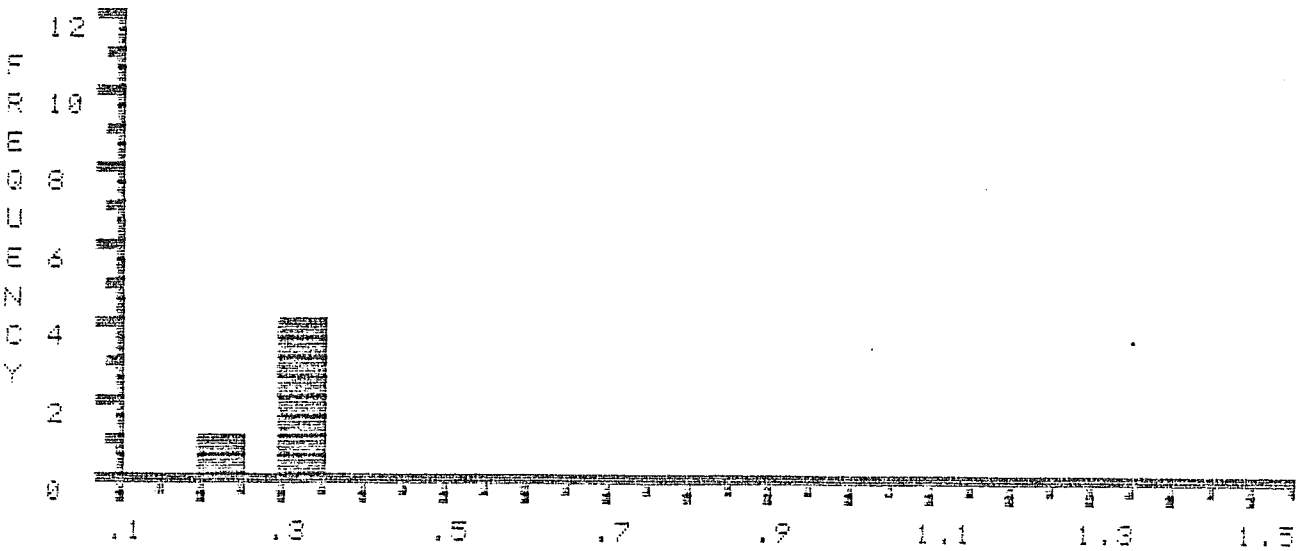
COL>	0	1	2	3	4	5	6	7	8	9
ROW		*.24	*.31	*.33	*.34	*.34	.41	.43	.43	.43
1	.44	.44	.45	.46	.47	.47	.48	.48	.48	.48
2	.48	.48	.5	.55	.56	.57	.59	.6	.6	.63
3	.63	.63	.64	.64	.65	.65	.66	.67	.67	.67
4	.68	.69	.69	.69	.7	.71	.72	.72	.73	.73
5	.74	.75	.76	.76	.77	.78	.79	.8	.81	.81
6	.84	.86	.87	.89	.93	.96	.96	.97	.99	1
7	1.04	1.1	1.12	1.15	1.19	1.26	1.45			

	SUM	NUMBER	MIN	MAX	MEAN	STAND.DEV.
TOTAL >	52.89	76	.24	1.45	.69	.24
*EDIT >	1.56	5	.24	.34	.31	.04

% R E F L E C T A N C E



% R E F L E C T A N C E * * EDITED * *

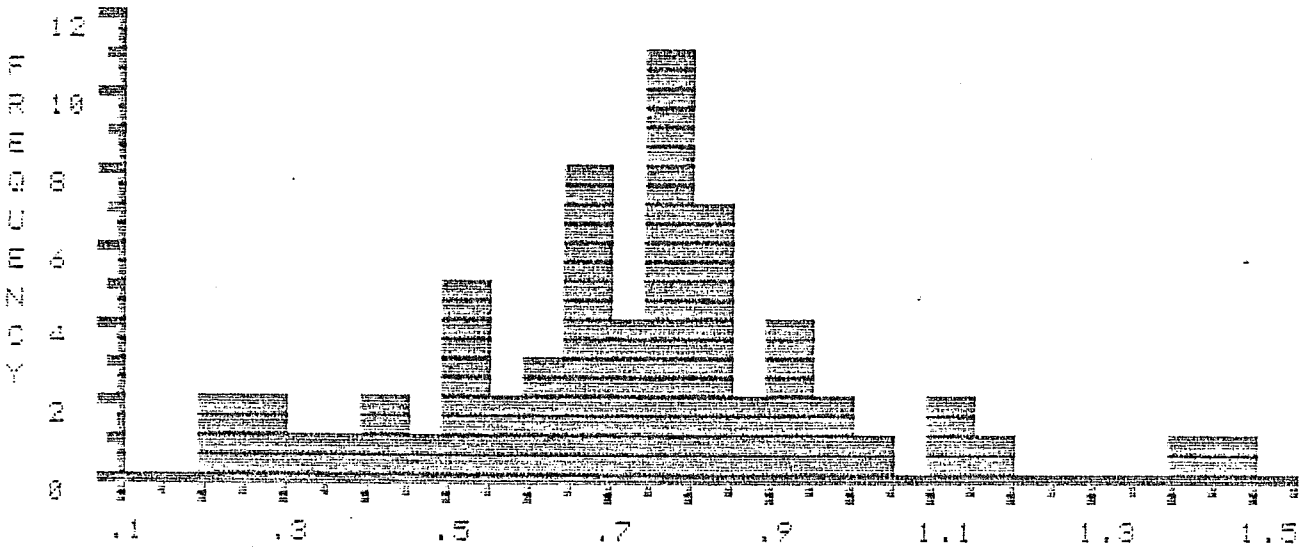


FILE >> K05558 DESCRIPTION FOLLOWS :
DEPTH 8290-8300M, BLUE H-28, MIKE AVERY, SEPT-7-85

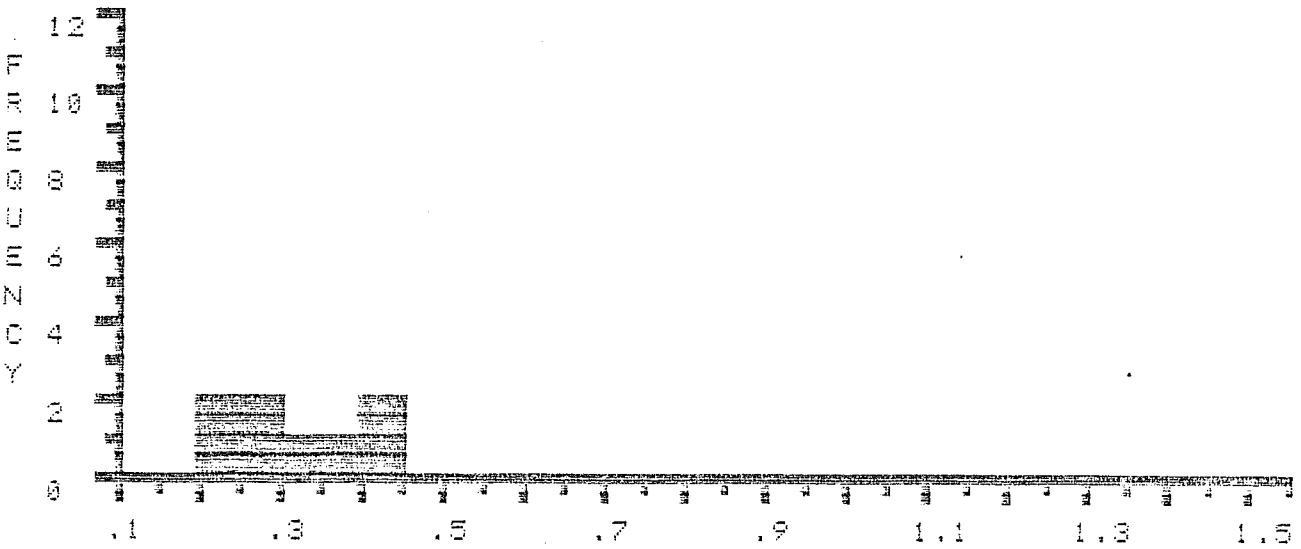
COL>	0	1	2	3	4	5	6	7	8	9
ROW		*.2	*.23	*.27	*.28	*.34	*.39	*.41	*.41	.47
1	.5	.51	.52	.53	.54	.55	.57	.62	.63	.64
2	.65	.66	.66	.68	.68	.69	.69	.69	.71	.73
3	.74	.74	.75	.77	.77	.77	.77	.78	.78	.78
4	.79	.79	.79	.8	.8	.8	.81	.83	.83	.84
5	.88	.89	.9	.91	.92	.92	.96	.97	1.02	1.11
6	1.13	1.16	1.4	1.47						

	SUM	NUMBER	MIN	MAX	MEAN	STAND.DEV.
TOTAL >	45.82	63	.2	1.47	.73	.25
*EDIT >	2.53	8	.2	.41	.32	.08

% R E F L E C T A N C E



% R E F L E C T A N C E * * EDITED * *

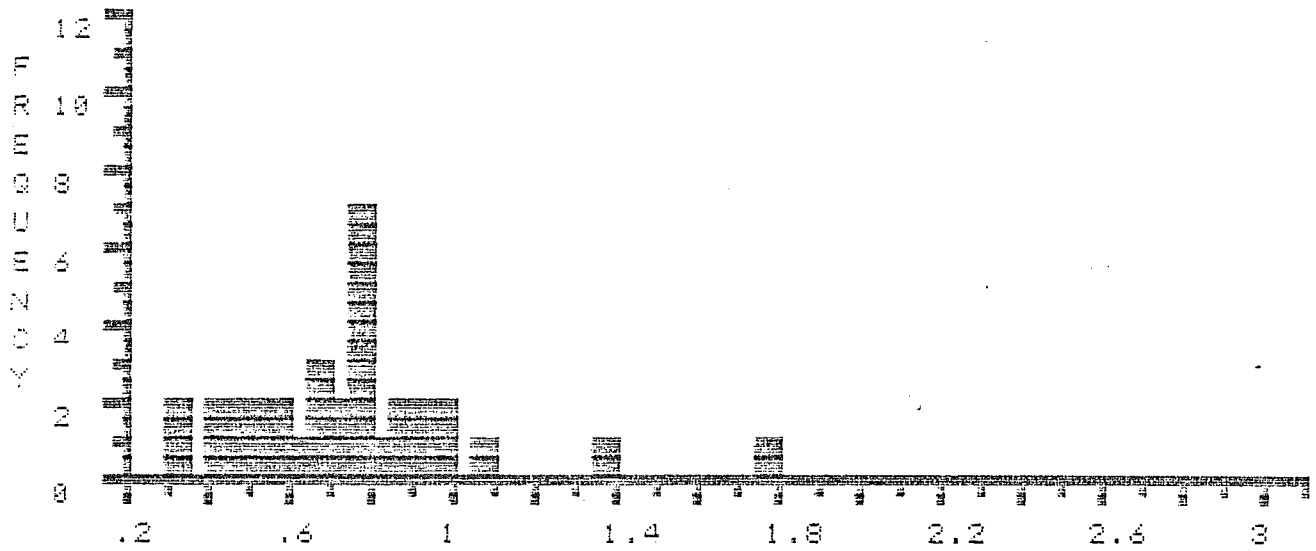


FILE >> K05550C DESCRIPTION FOLLOWS :
DEPTH 3410-3420M, BLUE H-28, MIKE AVERY, SEPT-7-85

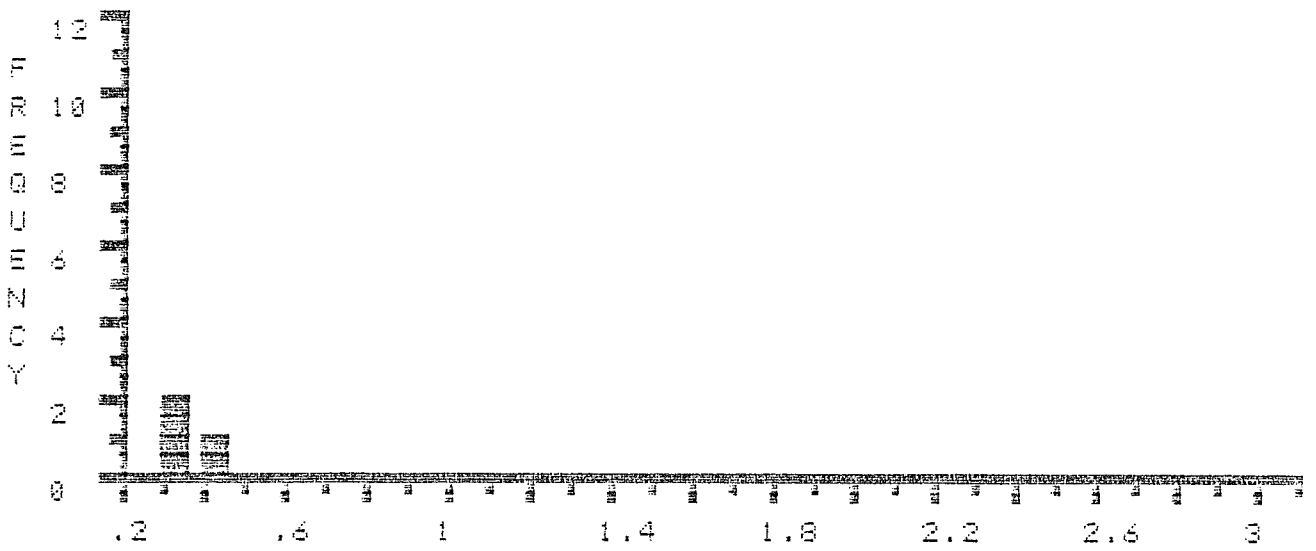
COL>	0	1	2	3	4	5	6	7	8	9
ROW		*.31	*.34	*.42	.44	.46	.47	.5	.54	.57
1	.59	.62	.66	.67	.69	.72	.73	.75	.76	.78
2	.78	.79	.79	.79	.84	.85	.87	.94	.94	.96
3	.97	1.07	1.39	1.79						

	SUM	NUMBER	MIN	MAX	MEAN	STAND.DEV.
TOTAL >	24.79	33	.31	1.79	.75	.29
*EDIT >	1.07	3	.31	.42	.36	.06

% R E F L E C T A N C E



% R E F L E C T A N C E * * EDITED * *

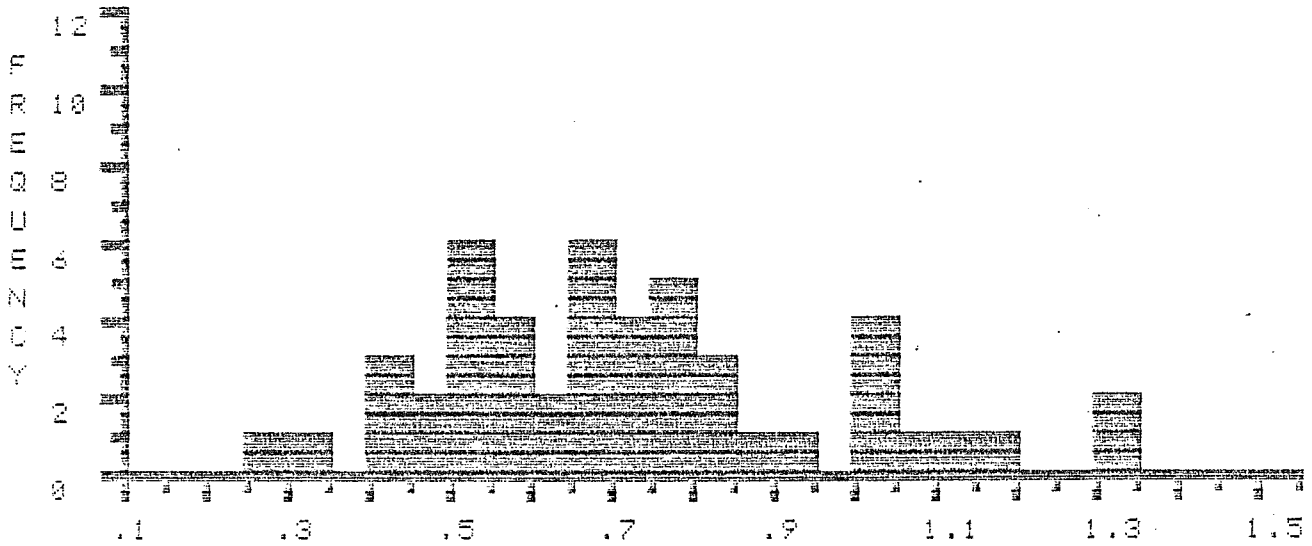


FILE >> K9556A DESCRIPTION FOLLOWS :
DEPTH 3590-3600M, BLUE H-26, MIKE AVERY, SEPT-7-85

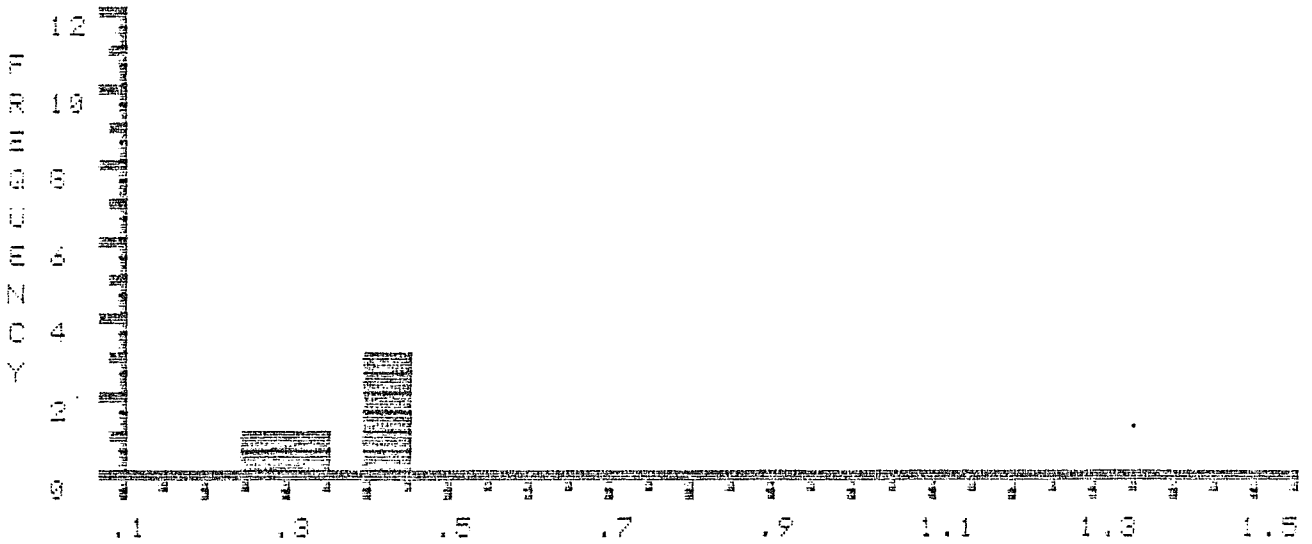
COL>	0	1	2	3	4	5	6	7	8	9
ROW		*.25	*.3	*.41	*.41	*.43	.47	.47	.5	.51
1	.51	.52	.54	.54	.55	.56	.57	.57	.6	.63
2	.67	.67	.68	.68	.68	.68	.72	.73	.73	.73
3	.75	.77	.77	.78	.78	.8	.8	.8	.89	.92
4	1	1	1.03	1.04	1.08	1.12	1.18	1.31	1.31	

	SUM	NUMBER	MIN	MAX	MEAN	STAND.DEV.
TOTAL >	34.44	48	.25	1.31	.72	.25
*EDIT >	1.8	5	.25	.43	.36	.08

% R E F L E C T A N C E



% R E F L E C T A N C E * * EDITED * *

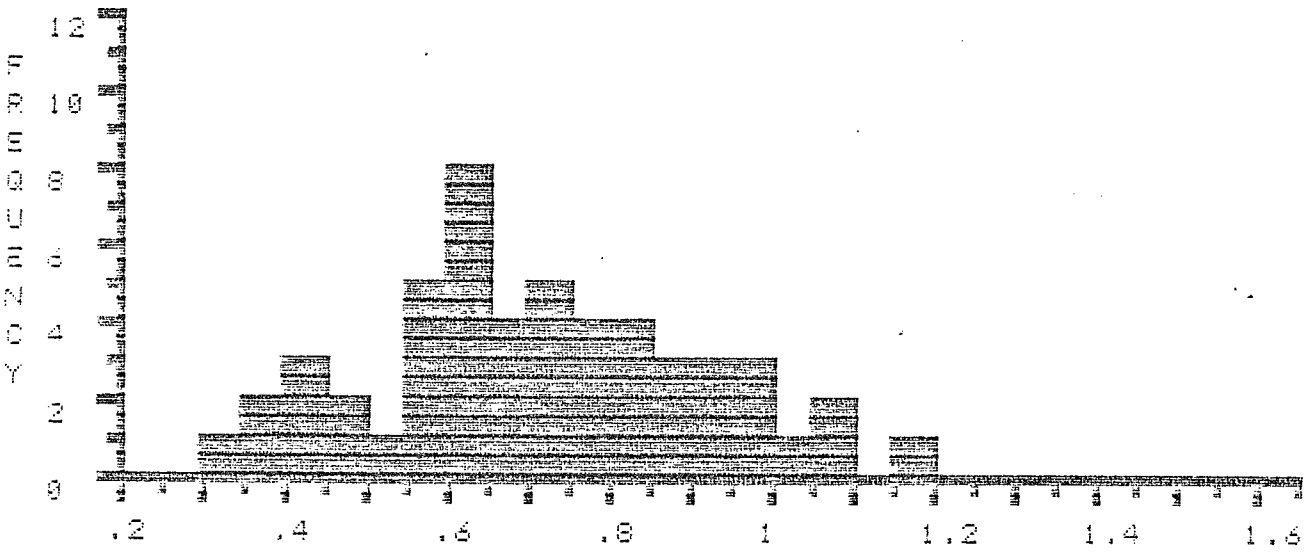


FILE >> K0556B DESCRIPTION FOLLOWS :
DEPTH 3750-3760M, BLUE H-28, MIKE AVERY, SEPT-7-85

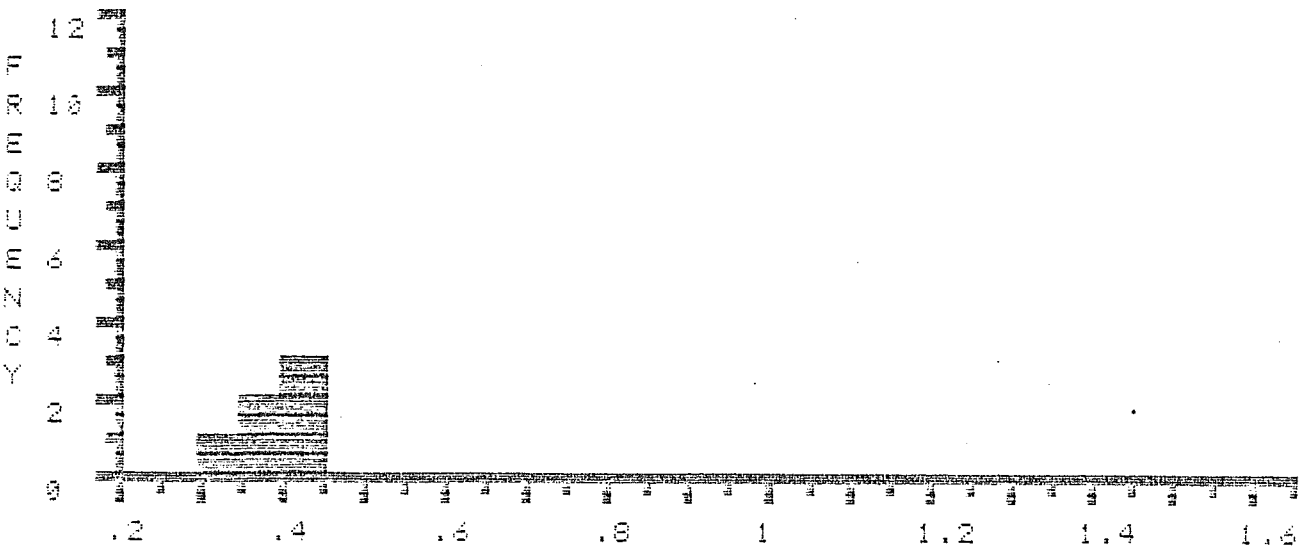
COL>	0	1	2	3	4	5	6	7	8	9
ROW		*.33	*.39	*.39	*.4	*.41	*.43	.48	.49	.51
1	.55	.55	.55	.57	.57	.6	.6	.62	.62	.63
2	.63	.64	.64	.65	.66	.67	.68	.71	.71	.72
3	.72	.73	.76	.77	.77	.77	.8	.8	.82	.83
4	.86	.86	.89	.9	.92	.94	.95	.97	.98	1.01
5	1.09	1.09	1.17							

	SUM	NUMBER	MIN	MAX	MEAN	STAND.DEV.
TOTAL >	36.8	52	.33	1.17	.71	.2
*EDIT >	2.35	6	.33	.43	.39	.03

% R E F L E C T A N C E



% R E F L E C T A N C E * * EDITED * *

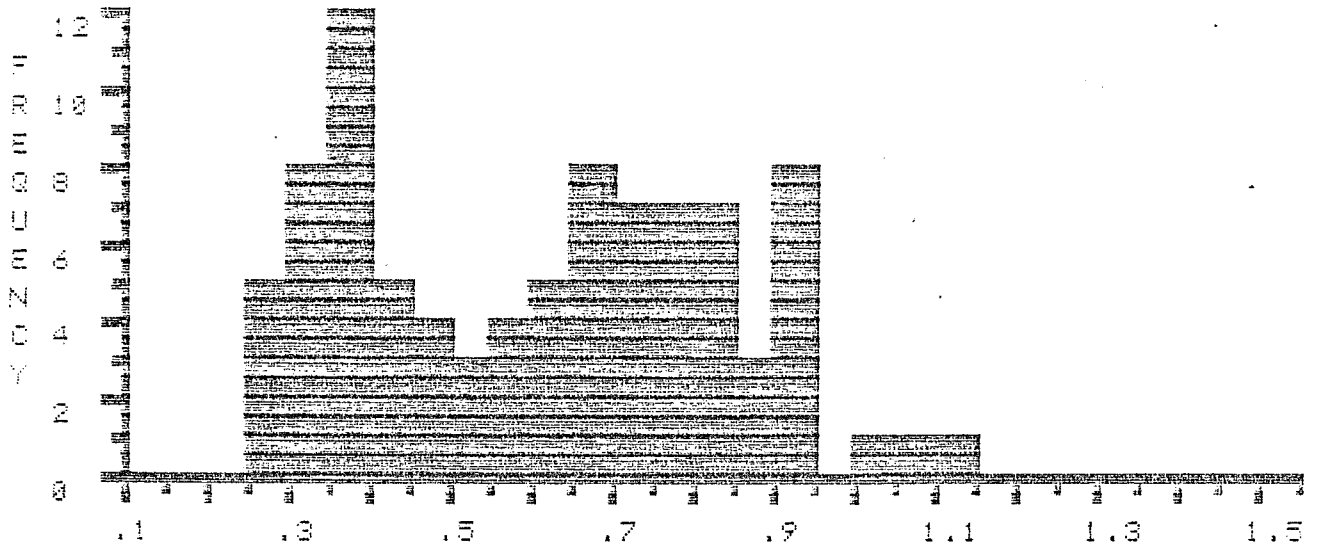


FILE >> K05560 DESCRIPTION FOLLOWS :
DEPTH 4030-4040M, BLUE H-28, MIKE AVERY, SEPT-7-85

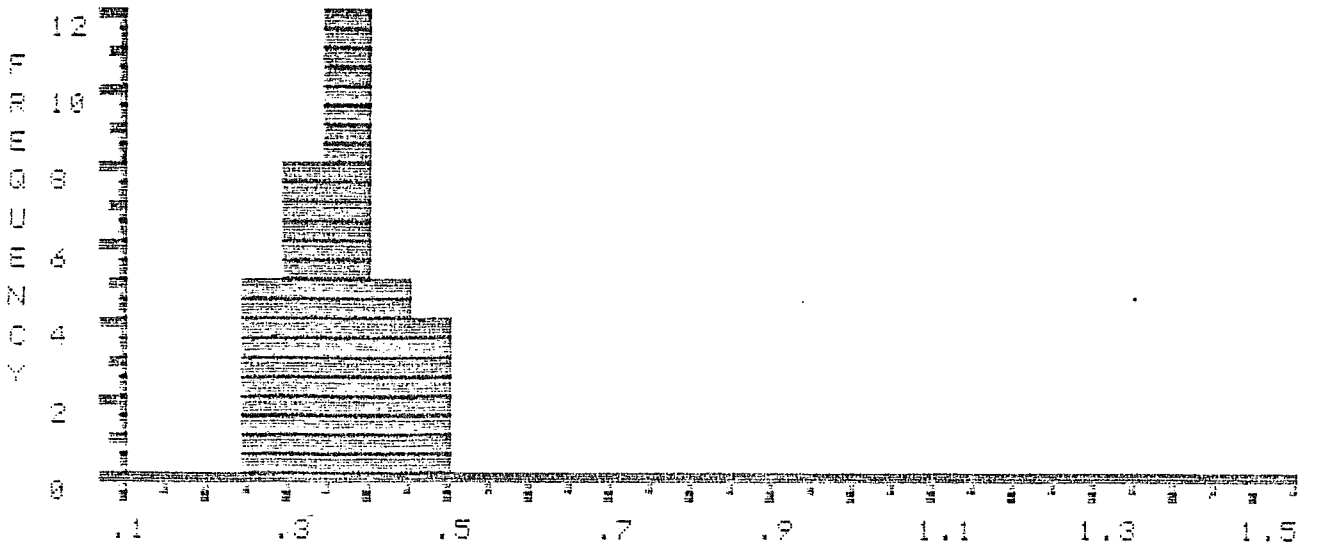
COL>	0	1	2	3	4	5	6	7	8	9
ROW		*.27	*.28	*.29	*.29	*.29	*.3	*.31	*.33	*.33
1	*.34	*.34	*.34	*.34	*.35	*.35	*.35	*.35	*.35	*.36
2	*.37	*.37	*.38	*.39	*.39	*.39	*.41	*.43	*.44	*.44
3	*.44	*.45	*.46	*.48	*.49	.52	.54	.54	.55	.57
4	.59	.59	.62	.63	.64	.64	.64	.65	.66	.67
5	.67	.67	.67	.68	.69	.7	.7	.7	.71	.73
6	.73	.73	.75	.75	.76	.77	.78	.78	.78	.8
7	.8	.81	.82	.82	.83	.84	.87	.87	.88	.9
8	.9	.91	.91	.91	.92	.93	.93	1	1.08	1.13

	SUM	NUMBER	MIN	MAX	MEAN	STAND.DEV.
TOTAL >	54.15	89	.27	1.13	.61	.22
*EDIT *	12.49	34	.27	.49	.37	.06

% R E F L E C T A N C E



% R E F L E C T A N C E * * EDITED * *

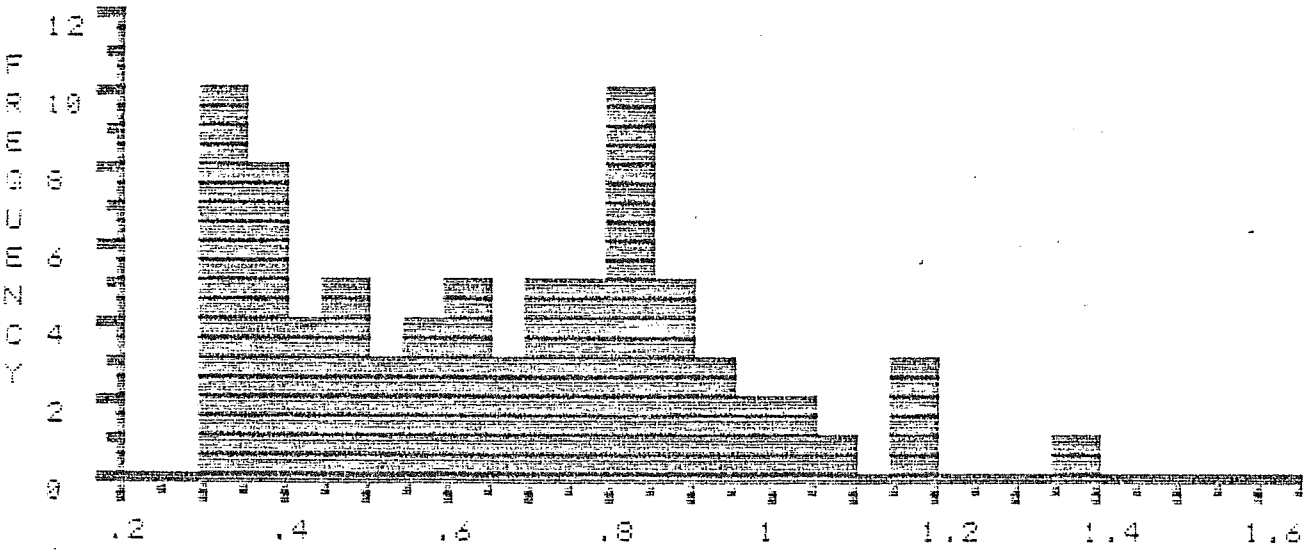


FILE >> K0E57A DESCRIPTION FOLLOWS :
DEPTH 4150-4160M, BLUE H-28, MIKE AVERY, SEPT-24-85

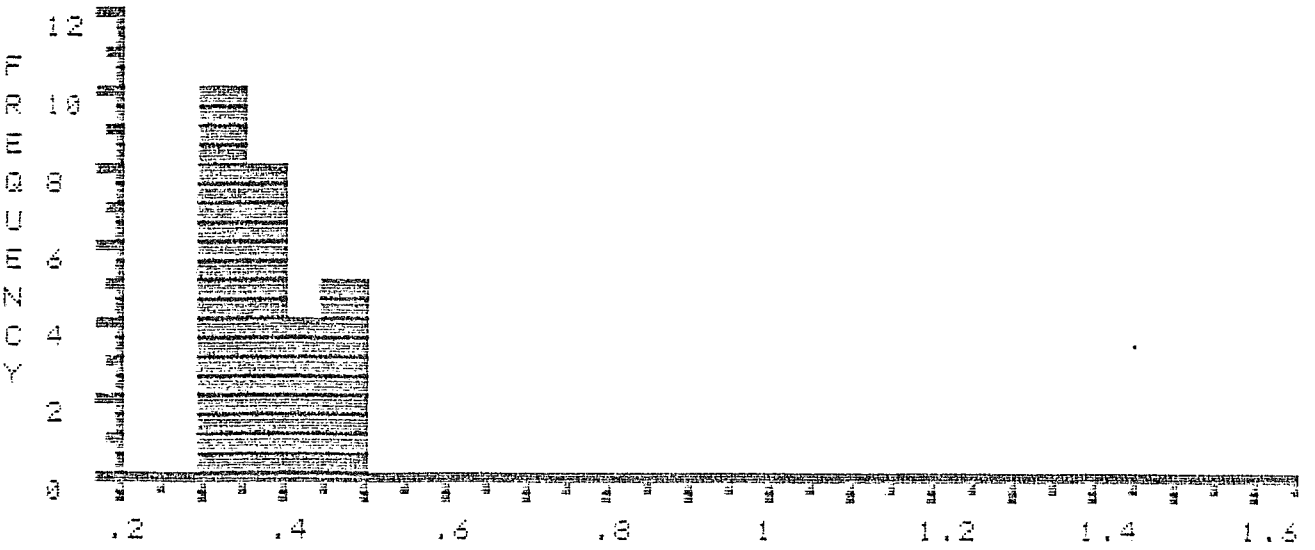
COL>	0	1	2	3	4	5	6	7	8	9
ROW		*.3	*.31	*.32	*.32	*.32	*.33	*.33	*.33	*.33
1	*.34	*.35	*.35	*.36	*.36	*.37	*.37	*.38	*.39	*.4
2	*.41	*.44	*.44	*.45	*.46	*.47	*.48	*.49	.51	.53
3	.54	.56	.58	.59	.59	.6	.61	.61	.62	.64
4	.65	.68	.68	.72	.73	.74	.74	.74	.75	.78
5	.79	.79	.79	.8	.81	.82	.82	.82	.82	.84
6	.84	.84	.84	.85	.85	.85	.87	.87	.9	.92
7	.93	.96	.98	1	1	1.06	1.15	1.17	1.19	1.39

	SUM	NUMBER	MIN	MAX	MEAN	STAND.DEV.
TOTAL >	51.95	79	.3	1.39	.66	.25
*EDIT >	10.2	27	.3	.49	.38	.06

% R E F L E C T A N C E



% R E F L E C T A N C E * * EDITED * *

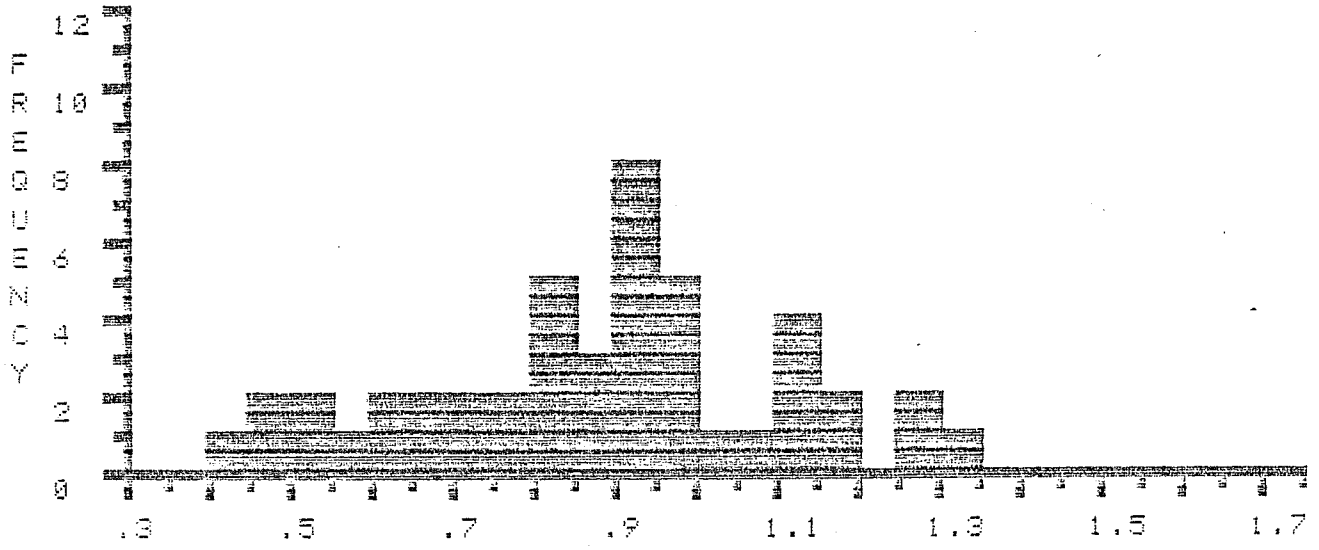


FILE >> K0557B DESCRIPTION FOLLOWS :
DEPTH 4330-4340M, BLUE H-28, MIKE AVERY, SEPT-24-85

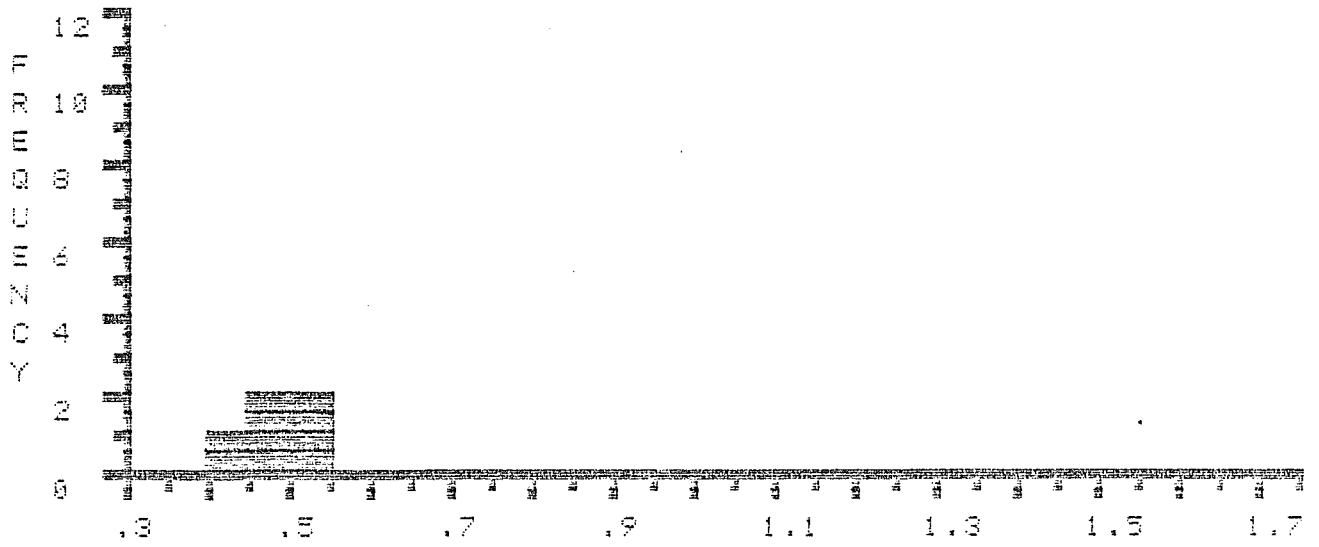
COL>	0	1	2	3	4	5	6	7	8	9
ROW		*.42	*.48	*.49	*.5	*.51	.58	.61	.62	.65
1	.66	.72	.74	.77	.77	.8	.82	.83	.83	.84
2	.87	.88	.89	.9	.91	.91	.92	.93	.93	.94
3	.94	.95	.95	.96	.96	.98	1.04	1.06	1.11	1.11
4	1.13	1.13	1.17	1.17	1.25	1.27	1.34			

	SUM	NUMBER	MIN	MAX	MEAN	STAND.DEV.
TOTAL >	40.24	46	.42	1.34	.87	.22
*EDIT >	2.4	5	.42	.51	.48	.04

% R E F L E C T A N C E



% R E F L E C T A N C E * * EDITED * *

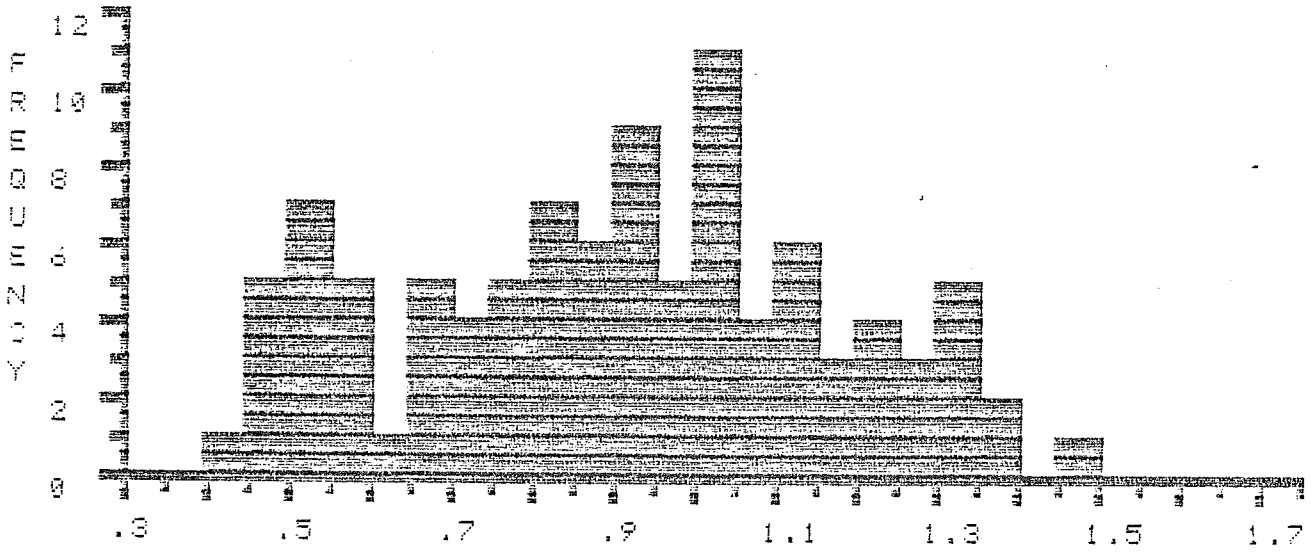


FILE >> K0557C DESCRIPTION FOLLOWS :
DEPTH 4480-4490M, BLUE H-28, MIKE AVERY, SEPT-24-85

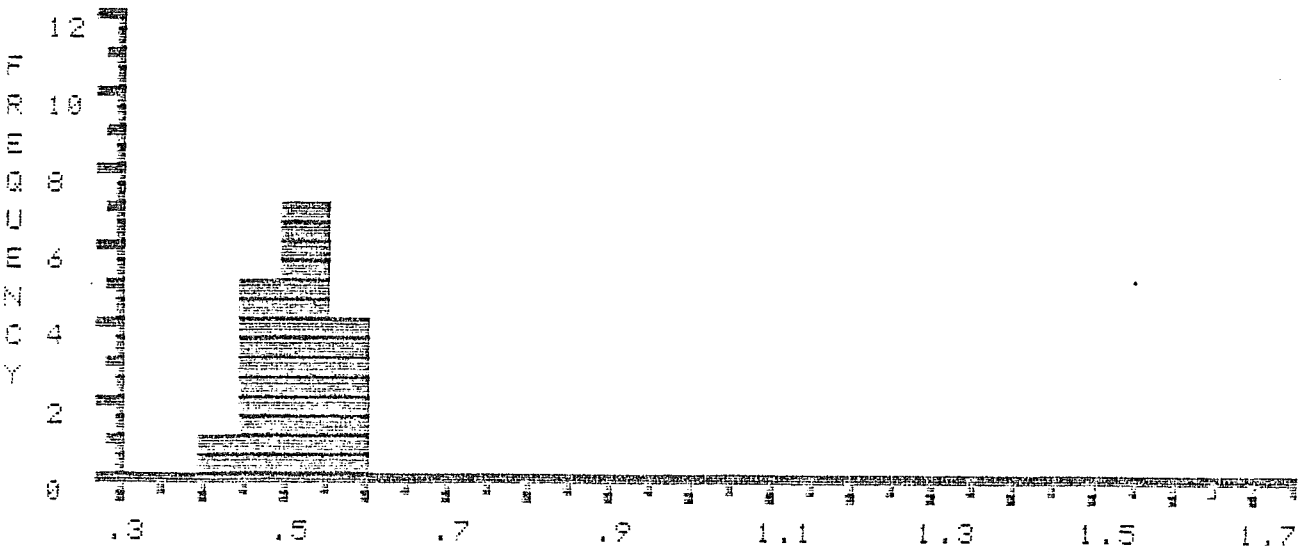
COL>	0	1	2	3	4	5	6	7	8	9
ROW		*.44	*.46	*.47	*.49	*.49	*.49	*.51	*.51	*.51
1	*.51	*.51	*.53	*.54	*.55	*.56	*.56	*.56	.59	.61
2	.65	.66	.68	.69	.69	.71	.71	.71	.71	.75
3	.76	.76	.77	.79	.81	.82	.83	.83	.83	.84
4	.84	.87	.88	.88	.88	.88	.89	.91	.91	.91
5	.92	.93	.94	.94	.94	.94	.95	.95	.96	.96
6	.99	1	1	1	1.01	1.01	1.02	1.02	1.02	1.02
7	1.03	1.04	1.05	1.06	1.08	1.09	1.11	1.11	1.11	1.12
8	1.13	1.13	1.18	1.18	1.19	1.2	1.21	1.22	1.22	1.25
9	1.26	1.26	1.3	1.3	1.3	1.32	1.34	1.37	1.37	1.46

	SUM	NUMBER	MIN	MAX	MEAN	STAND.DEV.
TOTAL >	89.22	99	.44	1.46	.9	.26
*EDIT >	8.69	17	.44	.56	.51	.04

% R E F L E C T A N C E



% R E F L E C T A N C E * * EDITED * *

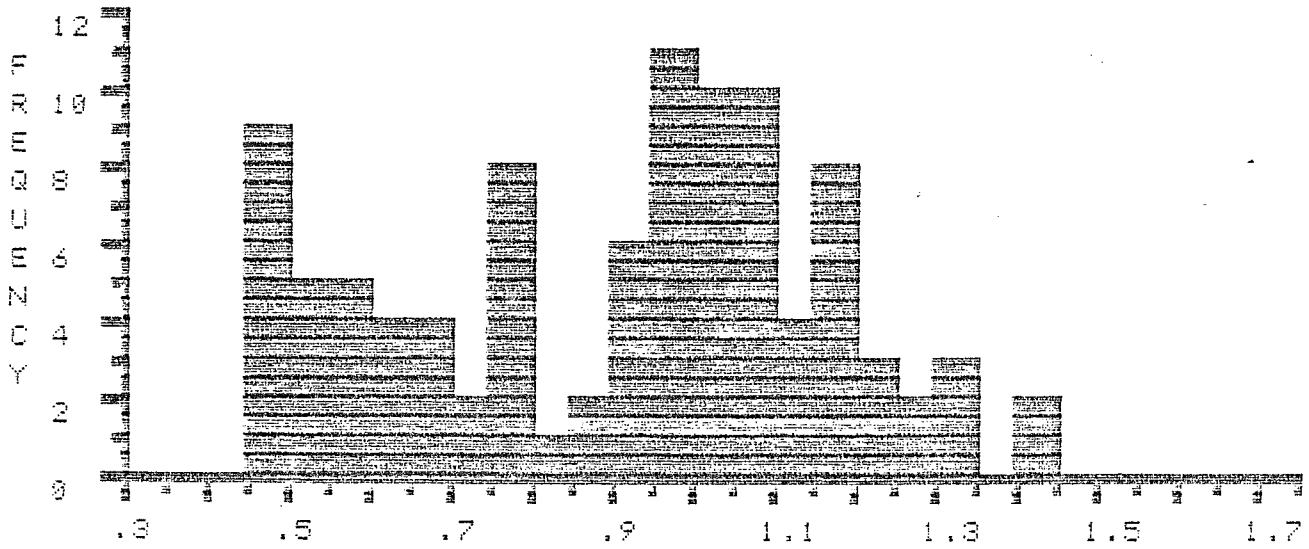


FILE >> K0558A DESCRIPTION FOLLOWS :
DEPTH 4690-4700M, BLUE H-28, MIKE AVERY, SEPT-28-83

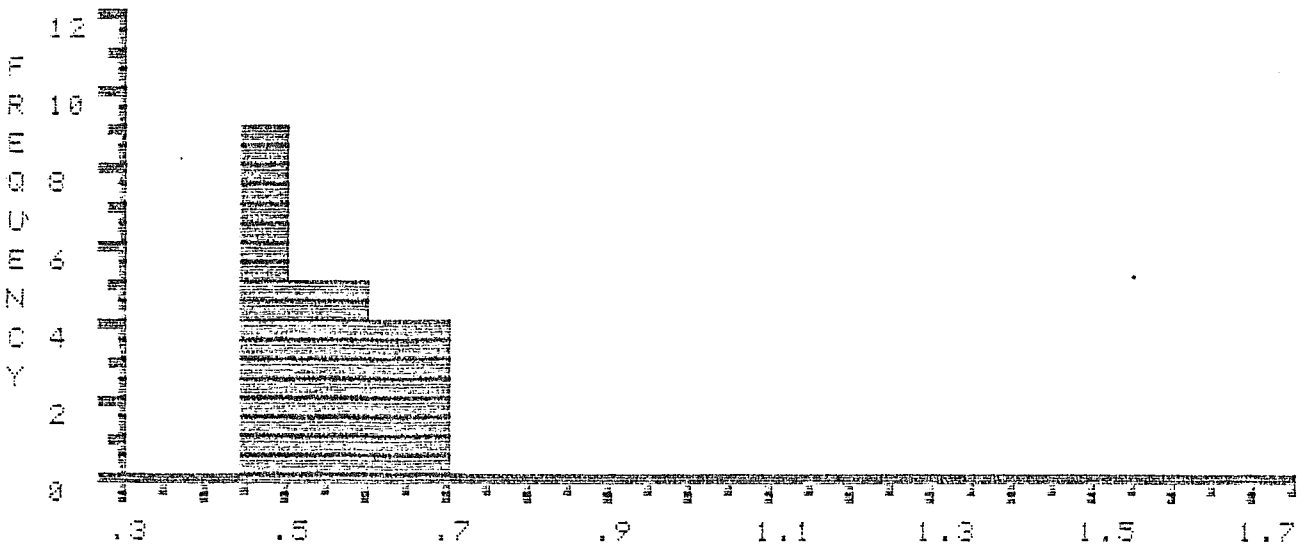
COL>	0	1	2	3	4	5	6	7	8	9
ROW		*.45	*.46	*.46	*.47	*.48	*.48	*.48	*.48	*.49
1	*.53	*.53	*.53	*.54	*.54	*.55	*.55	*.57	*.58	*.58
2	*.61	*.62	*.64	*.64	*.66	*.68	*.69	*.69	.72	.74
3	.75	.77	.77	.78	.78	.78	.79	.79	.82	.85
4	.87	.91	.91	.91	.92	.92	.94	.95	.95	.95
5	.95	.97	.97	.98	.98	.99	.99	.99	1	1.01
6	1.01	1.02	1.02	1.02	1.03	1.03	1.03	1.04	1.05	1.05
7	1.05	1.05	1.06	1.07	1.07	1.07	1.08	1.08	1.11	1.11
8	1.11	1.13	1.15	1.15	1.15	1.17	1.18	1.19	1.19	1.19
9	1.2	1.28	1.24	1.26	1.28	1.32	1.33	1.34	1.43	1.44

	SUM	NUMBER	MIN	MAX	MEAN	STAND.DEV.
TOTAL >	89.11	99	.45	1.44	.9	.26
*EDIT >	14.98	27	.45	.69	.55	.08

% R E F L E C T A N C E



% R E F L E C T A N C E * * EDITED * *

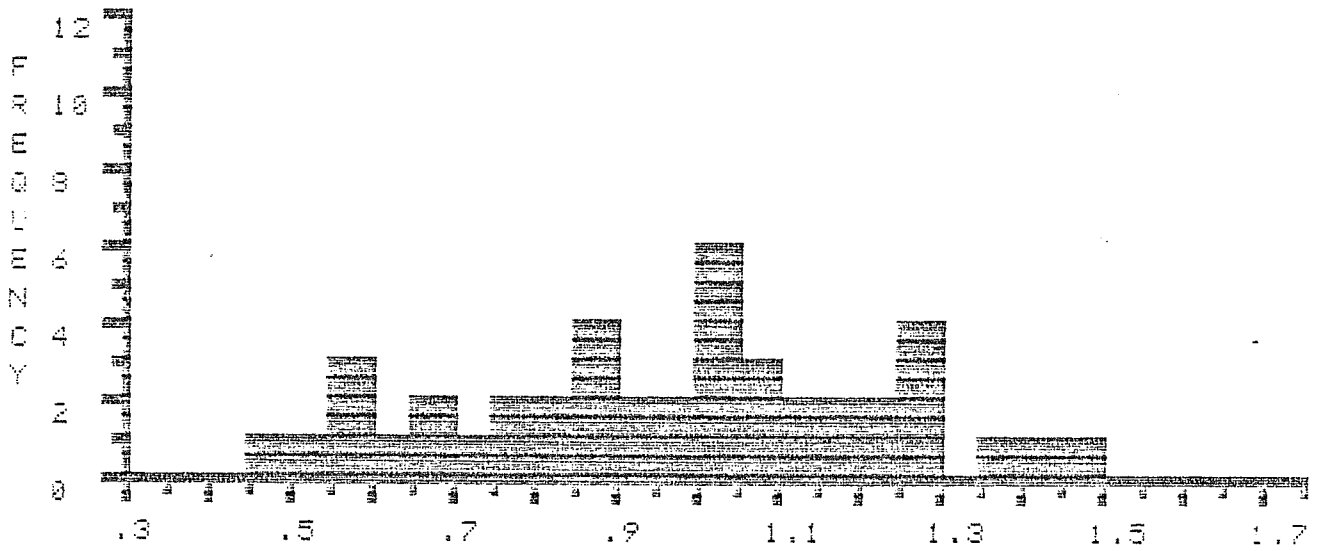


FILE >> M8E588 DESCRIPTION FOLLOWS :
. DEPTH 4770-4780M, BLUE H-28, MIKE AVERY, SEPT-28-85

COL>	0	1	2	3	4	5	6	7	8	9
ROW		*.48	*.53	*.55	*.57	*.57	*.61	*.67	*.69	*.73
1	.77	.79	.82	.82	.86	.87	.89	.89	.91	.93
2	.95	.99	1	1.01	1.02	1.03	1.04	1.04	1.07	1.07
3	1.08	1.11	1.11	1.16	1.16	1.21	1.22	1.26	1.26	1.27
4	1.27	1.37	1.41	1.47						

	SUM	NUMBER	MIN	MAX	MEAN	STAND.DEV.
TOTAL >	41.53	43	.48	1.47	.97	.25
*EDIT >	5.4	9	.48	.73	.6	.08

% R E F L E C T A N C E



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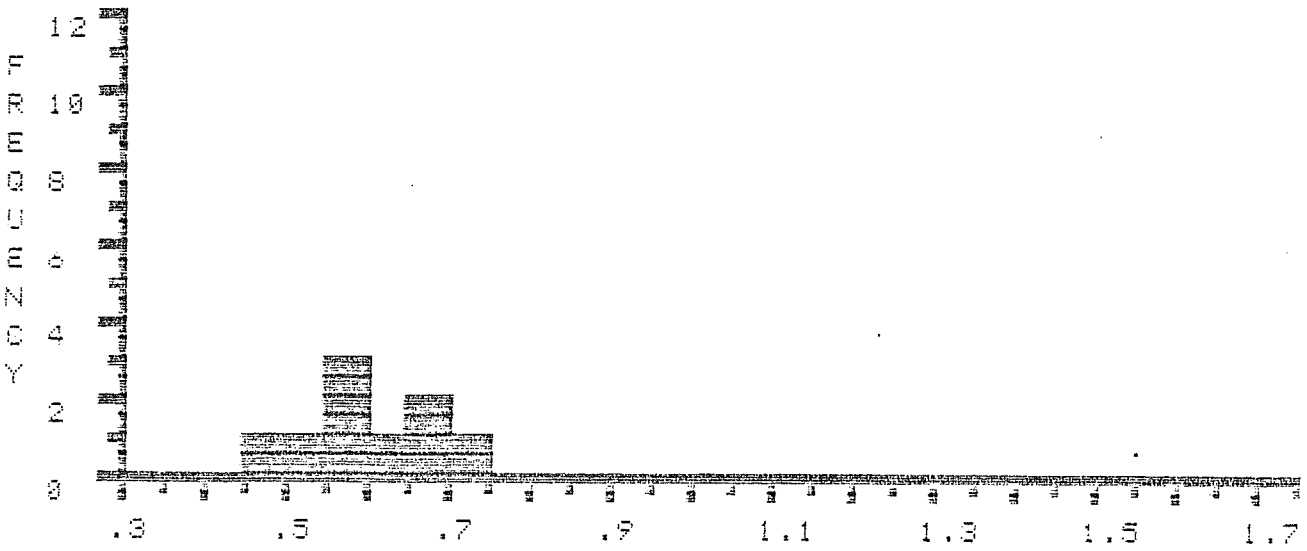
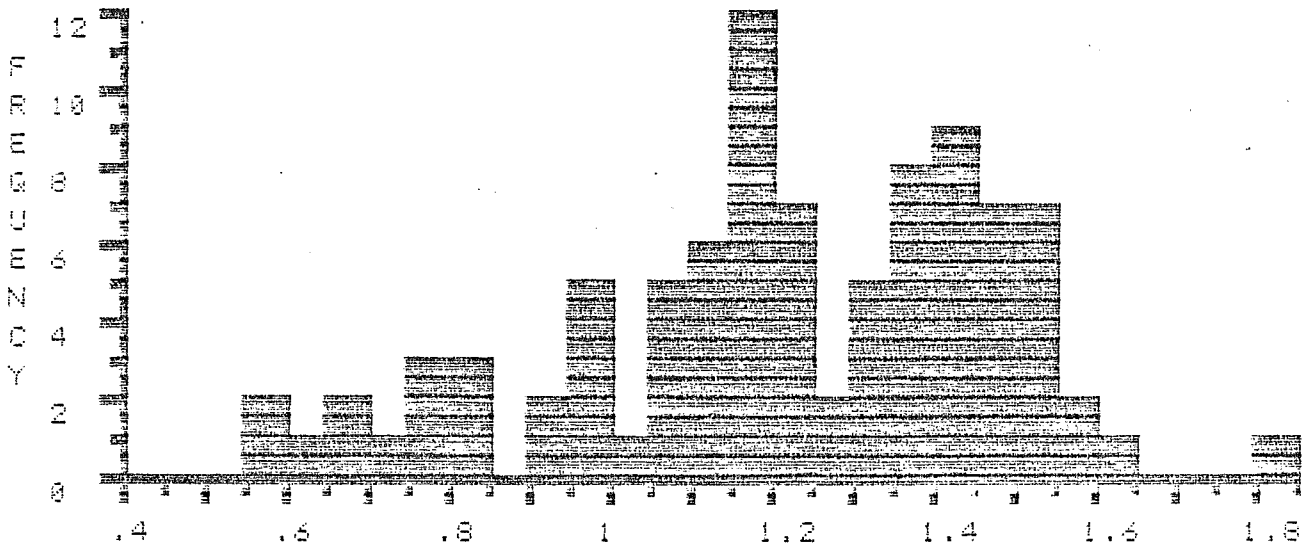


FILE >> K8558C DESCRIPTION FOLLOWS :
DEPTH 4930-4940M, BLUE H-28, MIKE AVERY, SEP1-29-85

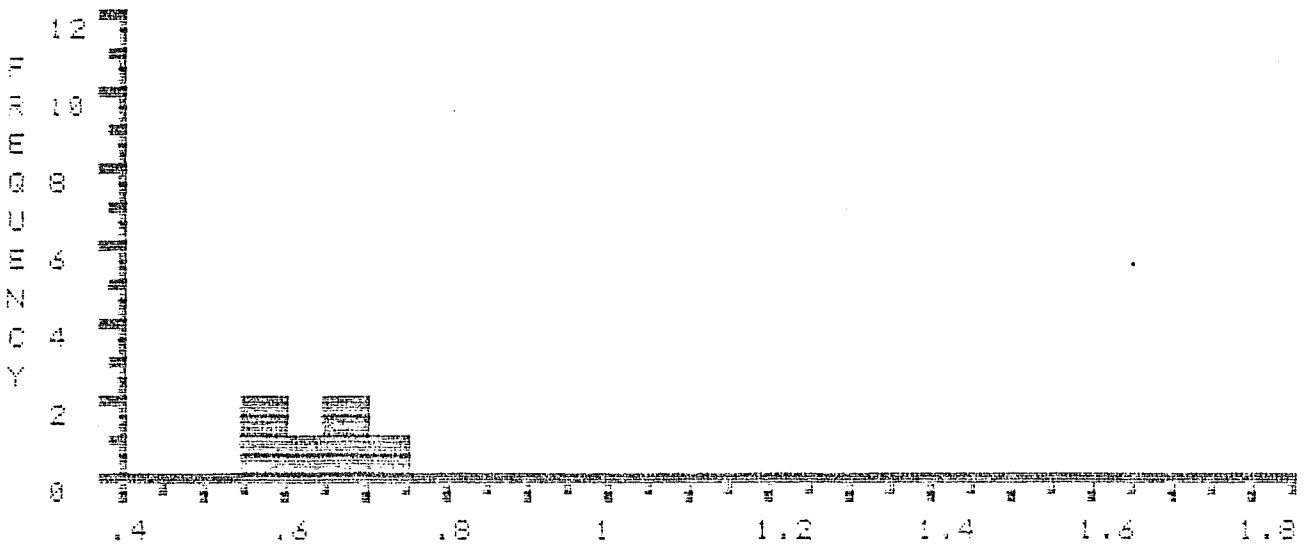
COL>	0	1	2	3	4	5	6	7	8	9
ROW		*.55	*.58	*.63	*.65	*.66	*.73	.75	.75	.7
1	.82	.84	.84	.93	.94	.95	.97	.98	.99	.99
2	1.01	1.05	1.06	1.06	1.09	1.09	1.12	1.12	1.13	1.13
3	1.14	1.14	1.15	1.15	1.15	1.15	1.16	1.17	1.18	1.18
4	1.18	1.19	1.19	1.19	1.21	1.22	1.22	1.23	1.23	1.23
5	1.24	1.25	1.26	1.31	1.31	1.32	1.33	1.34	1.35	1.35
6	1.36	1.36	1.37	1.38	1.39	1.39	1.4	1.41	1.41	1.41
7	1.42	1.43	1.43	1.44	1.44	1.45	1.45	1.47	1.48	1.48
8	1.49	1.49	1.5	1.51	1.51	1.52	1.52	1.52	1.53	1.56
9	1.59	1.64	1.82							

	SUM	NUMBER	MIN	MAX	MEAN	STAND.DEV.
TOTAL >	111.46	92	.55	1.82	1.21	.26
*EDIT >	3.8	6	.55	.73	.63	.06

% R E F L E C T A N C E



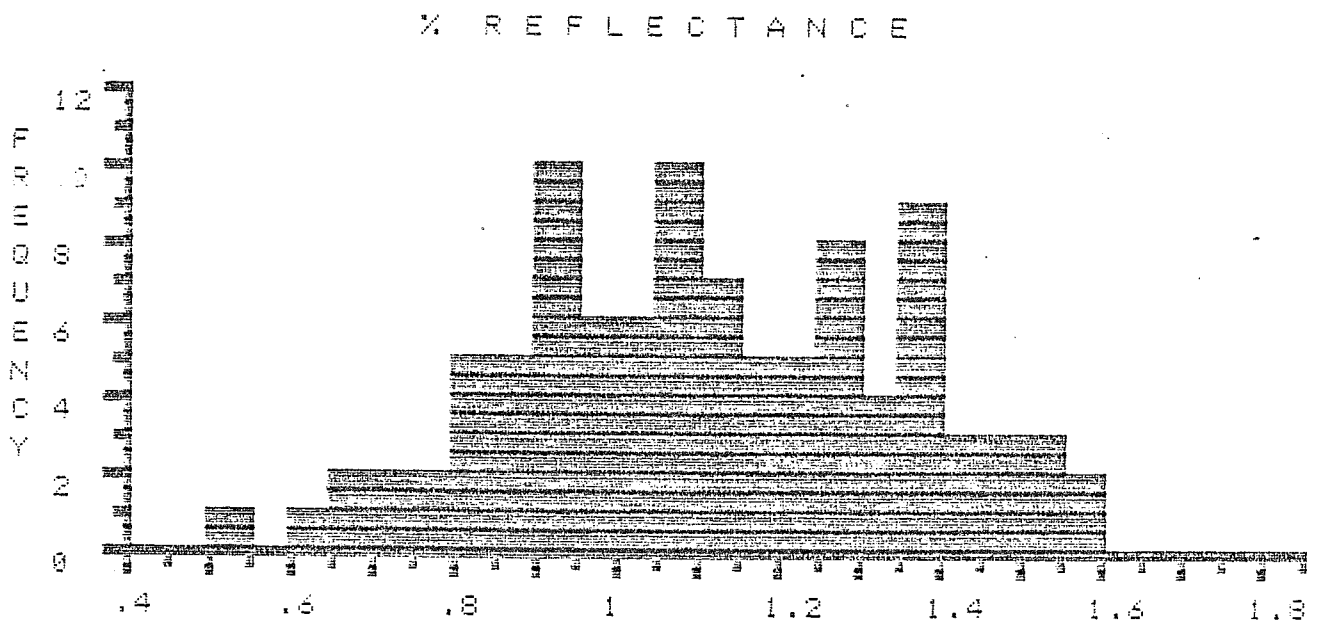
% R E F L E C T A N C E * * EDITED * *

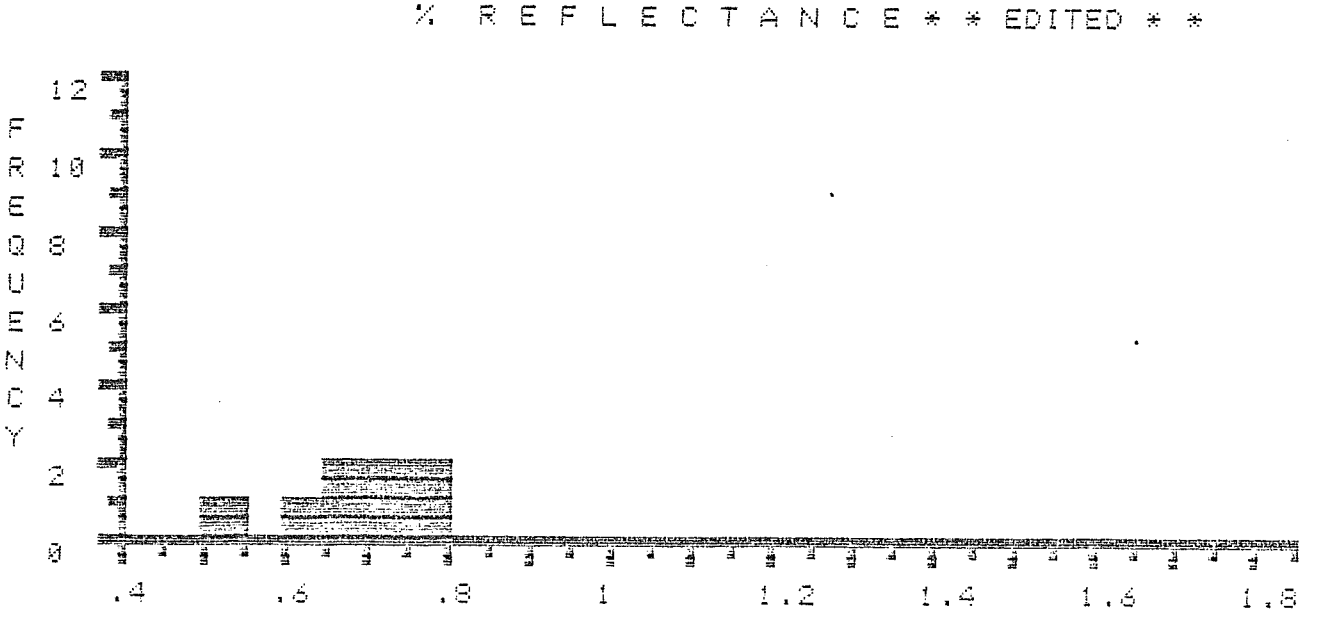


FILE >> K0559A DESCRIPTION FOLLOWS :
DEPTH 5070-5080M, BLUE H-28, MIKE AVERY, SEPT-28-85

COL>	0	1	2	3	4	5	6	7	8	9
ROW		*.52	*.64	*.68	*.68	*.71	*.71	*.75	*.77	.8
1	.81	.82	.82	.82	.86	.88	.88	.89	.89	.9
2	.9	.9	.91	.92	.93	.93	.94	.94	.94	.95
3	.96	.97	.97	.98	.99	1	1	1.03	1.03	1.04
4	1.04	1.05	1.06	1.07	1.07	1.08	1.08	1.08	1.08	1.08
5	1.09	1.1	1.11	1.12	1.13	1.13	1.14	1.14	1.15	1.16
6	1.18	1.19	1.19	1.2	1.2	1.21	1.24	1.24	1.25	1.25
7	1.26	1.28	1.28	1.29	1.29	1.29	1.3	1.3	1.3	1.34
8	1.35	1.37	1.37	1.38	1.38	1.38	1.39	1.39	1.39	1.4
9	1.4	1.44	1.45	1.46	1.47	1.5	1.51	1.51	1.59	1.59

	SUM	NUMBER	MIN	MAX	MEAN	STAND.DEV.
TOTAL >	109.82	99	.52	1.59	1.11	.24
*EDIT >	5.46	8	.52	.77	.68	.08



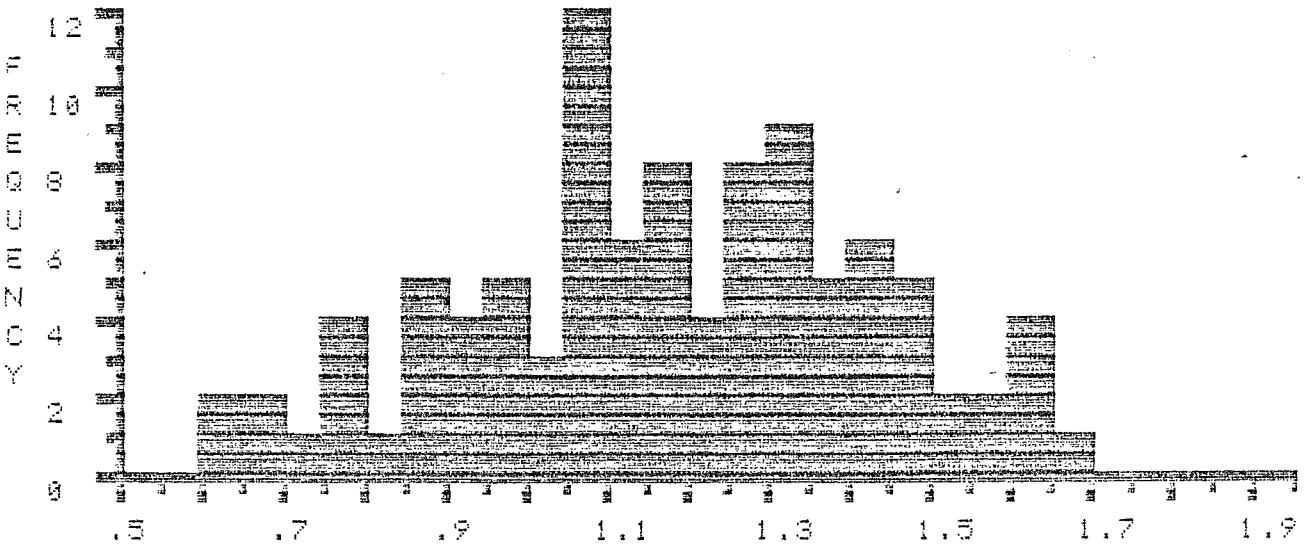


FILE >> K0559B DESCRIPTION FOLLOWS :
DEPTH 5230-5240M, SLUE H-28, MIKE AVERY, SEPT-28-85

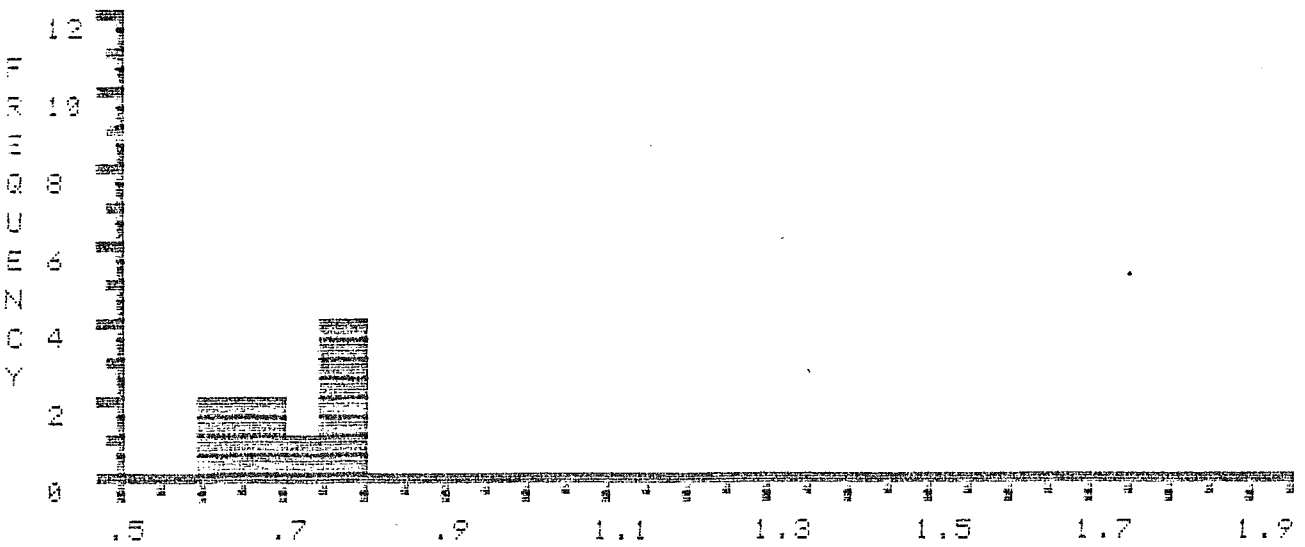
COL>	0	1	2	3	4	5	6	7	8	9
ROW		*.62	*.64	*.66	*.67	*.74	*.76	*.78	*.78	*.79
1	.83	.85	.86	.87	.88	.89	.91	.91	.93	.93
2	.96	.97	.98	.98	.99	1.01	1.01	1.02	1.05	1.05
3	1.06	1.06	1.07	1.07	1.07	1.08	1.08	1.08	1.09	1.09
4	1.1	1.11	1.12	1.12	1.13	1.13	1.15	1.15	1.16	1.16
5	1.19	1.19	1.19	1.19	1.2	1.2	1.21	1.23	1.25	1.25
6	1.26	1.27	1.27	1.27	1.29	1.29	1.3	1.31	1.31	1.31
7	1.31	1.32	1.33	1.33	1.34	1.35	1.37	1.37	1.38	1.39
8	1.41	1.43	1.43	1.43	1.44	1.44	1.46	1.46	1.46	1.47
9	1.49	1.5	1.51	1.58	1.59	1.6	1.6	1.6	1.6	1.67

	SUM	NUMBER	MIN	MAX	MEAN	STAND.DEV.
TOTAL >	116.04	99	.62	1.67	1.17	.25
*EDIT >	6.44	9	.62	.79	.72	.07

% R E F L E C T A N C E



% R E F L E C T A N C E * * EDITED * *

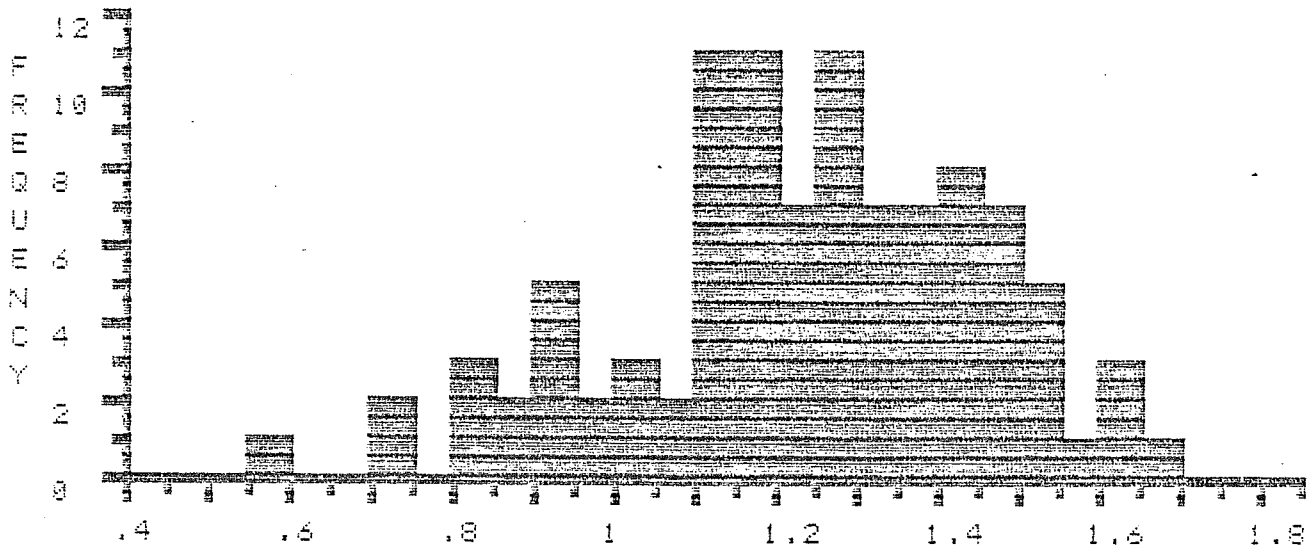


FILE >> K0559C DESCRIPTION FOLLOWS :
DEPTH 5400-5410M, BLUE H-28, MIKE AVERY, SEPT-28-85

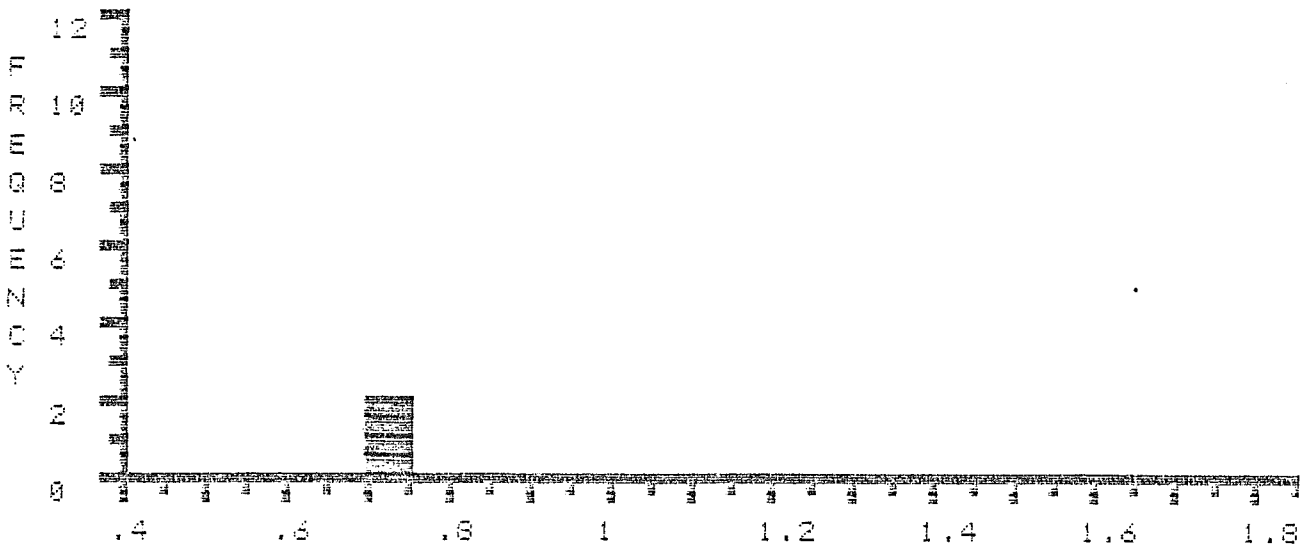
COL>	0	1	2	3	4	5	6	7	8	9
ROW		.59	*.7	*.74	.8	.8	.84	.87	.89	.9
1	.9	.92	.92	.93	.99	.99	1	1.03	1.04	1.07
2	1.08	1.1	1.1	1.1	1.11	1.12	1.13	1.13	1.14	1.14
3	1.14	1.14	1.15	1.15	1.15	1.15	1.15	1.15	1.16	1.16
4	1.16	1.16	1.19	1.2	1.2	1.22	1.22	1.22	1.24	1.24
5	1.25	1.25	1.25	1.25	1.25	1.25	1.27	1.27	1.27	1.28
6	1.29	1.3	1.31	1.31	1.32	1.33	1.34	1.34	1.35	1.35
7	1.35	1.36	1.36	1.38	1.39	1.4	1.4	1.41	1.42	1.43
8	1.43	1.44	1.44	1.45	1.45	1.45	1.46	1.47	1.49	1.49
9	1.5	1.51	1.52	1.52	1.54	1.55	1.6	1.62	1.64	1.66

	SUM	NUMBER	MIN	MAX	MEAN	STAND.DEV.
TOTAL >	121.58	99	.59	1.66	1.23	.22
*EDIT >	1.44	2	.7	.74	.72	.03

% R E F L E C T A N C E



% R E F L E C T A N C E * * EDITED * *

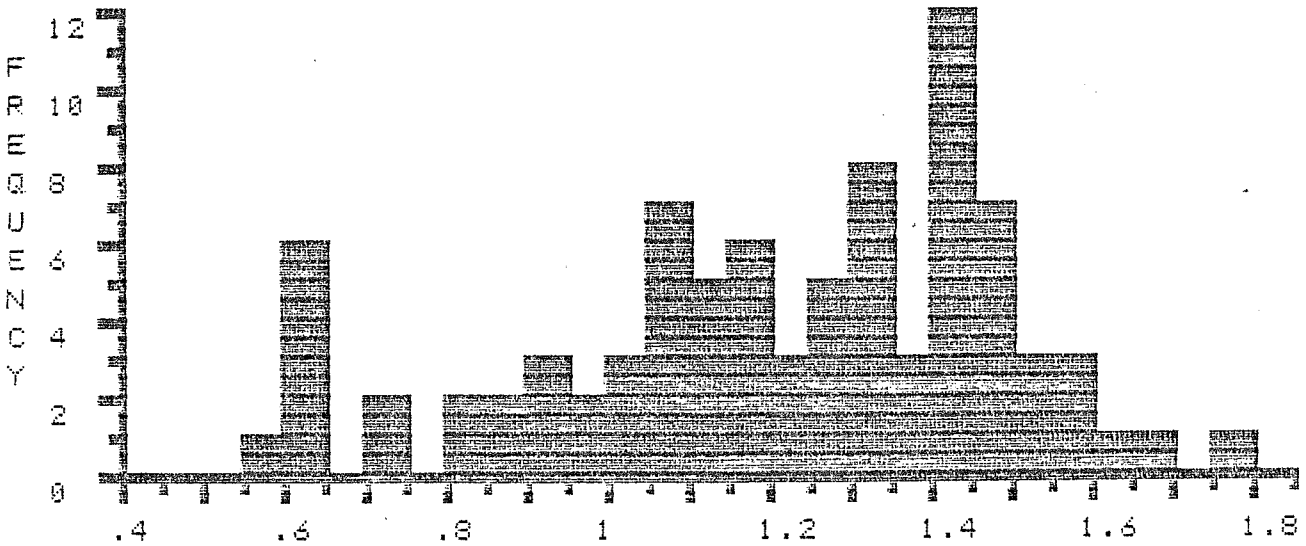


FILE >> K0560A DESCRIPTION FOLLOWS :
DEPTH 5530-5540M, BLUE H-28, MIKE AVERY, SEPT-28-85

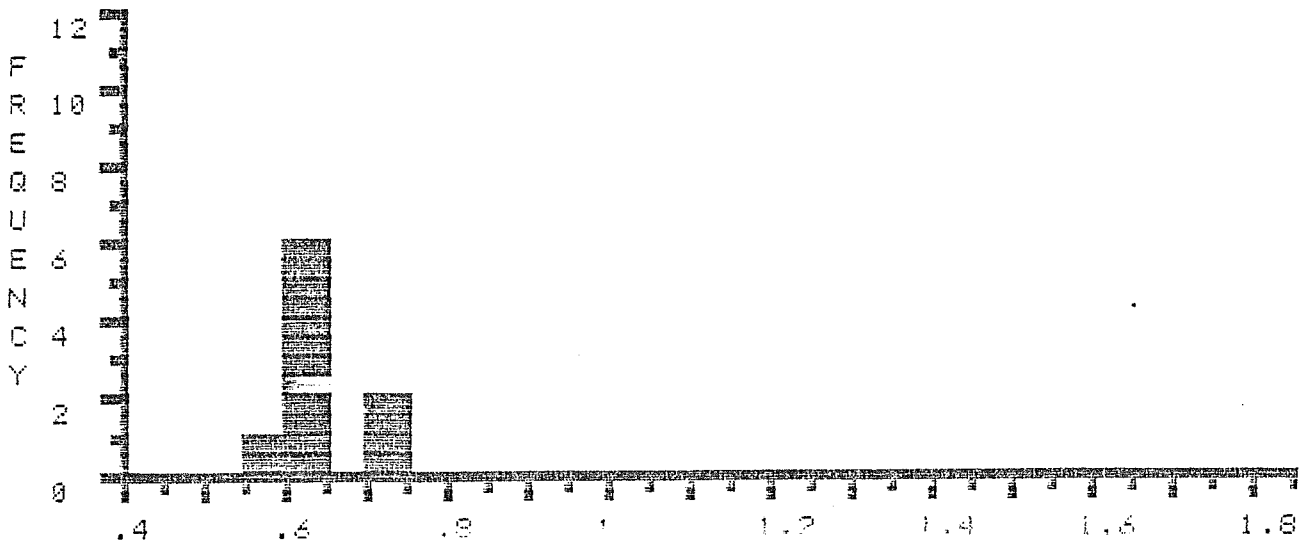
COL>	0	1	2	3	4	5	6	7	8	9
ROW		*.58	*.6	*.6	*.62	*.62	*.62	*.64	*.7	*.72
1	.83	.83	.88	.89	.92	.93	.94	.95	.96	1.02
2	1.03	1.03	1.05	1.05	1.05	1.07	1.08	1.09	1.09	1.1
3	1.1	1.12	1.12	1.14	1.15	1.15	1.17	1.18	1.19	1.19
4	1.21	1.21	1.24	1.26	1.26	1.27	1.27	1.27	1.31	1.31
5	1.31	1.33	1.34	1.34	1.34	1.34	1.35	1.35	1.38	1.41
6	1.41	1.41	1.41	1.42	1.42	1.42	1.43	1.43	1.44	1.44
7	1.44	1.45	1.45	1.46	1.46	1.48	1.48	1.49	1.51	1.51
8	1.54	1.55	1.56	1.56	1.61	1.69	1.76			

	SUM	NUMBER	MIN	MAX	MEAN	STAND.DEV.
TOTAL >	103.33	86	.58	1.76	1.2	.28
*EDIT >	5.7	9	.58	.72	.63	.05

% R E F L E C T A N C E



% R E F L E C T A N C E * * EDITED * *

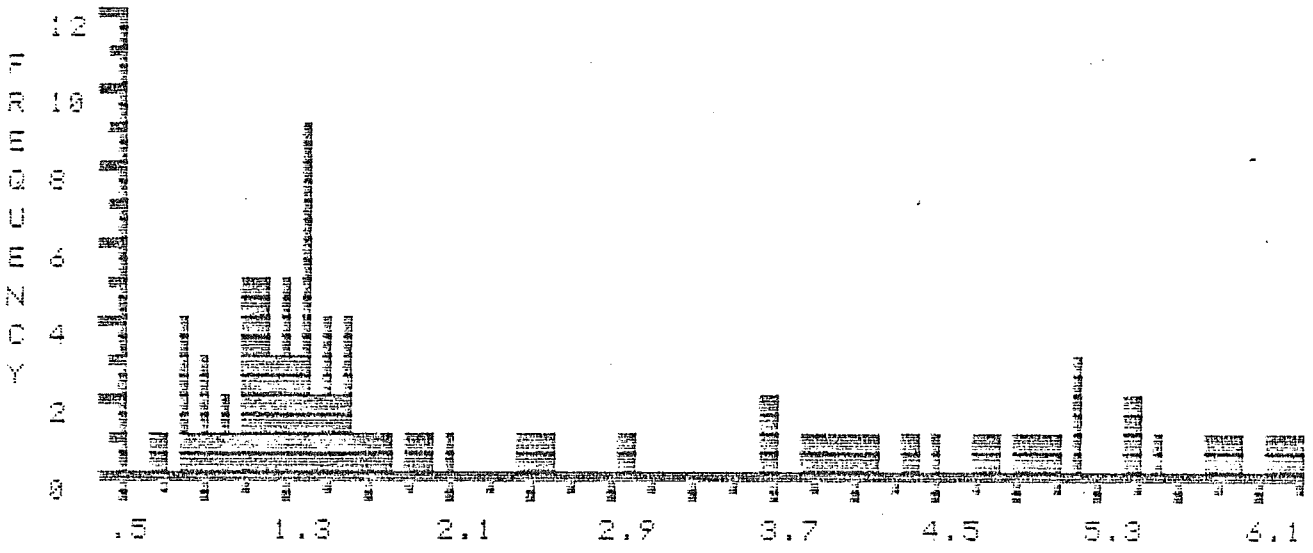


FILE >> K8560C DESCRIPTION FOLLOWS :
DEPTH 5330-5840M, BLUE H-28, MIKE AVERY, DEC-7-85

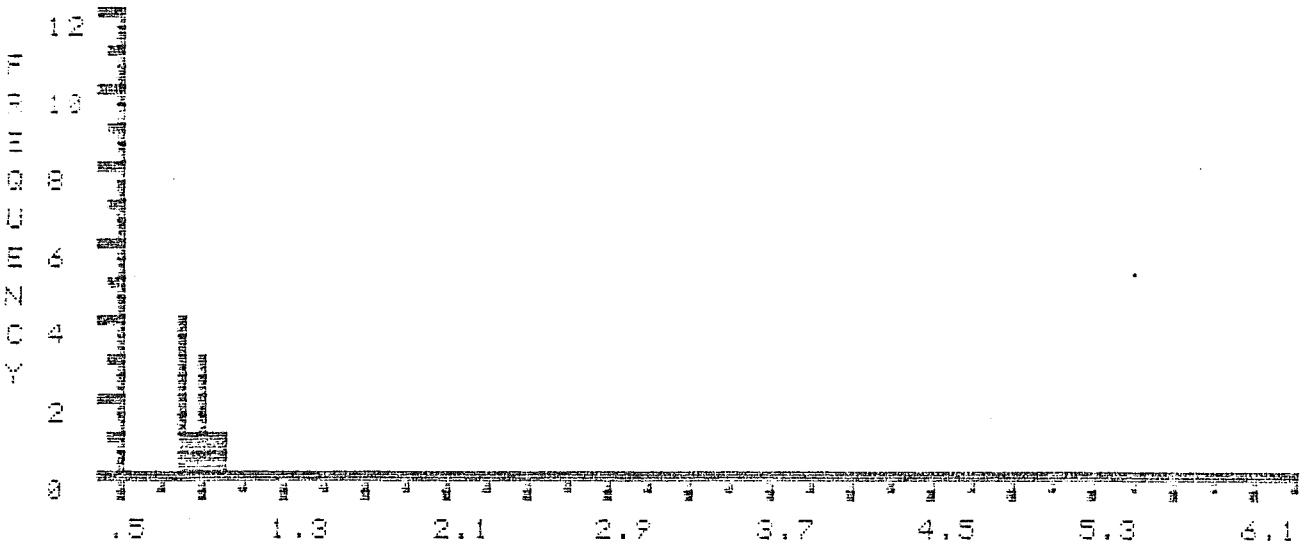
COL>	0	1	2	3	4	5	6	7	8	9
ROW		.68	.7	*.8	*.81	*.83	*.84	*.88	*.9	*.93
1	*.94	*.96	1.03	1.04	1.09	1.11	1.14	1.14	1.14	1.14
2	1.16	1.17	1.18	1.19	1.19	1.2	1.21	1.22	1.22	1.23
3	1.25	1.26	1.29	1.31	1.31	1.32	1.33	1.34	1.36	1.37
4	1.39	1.4	1.4	1.41	1.41	1.41	1.42	1.42	1.44	1.44
5	1.47	1.48	1.5	1.5	1.5	1.53	1.58	1.58	1.61	1.62
6	1.62	1.64	1.65	1.72	1.77	1.82	1.9	1.97	2.14	2.45
7	2.59	2.96	3.65	3.66	3.86	3.92	3.99	4.05	4.18	4.37
8	4.53	4.74	4.76	4.94	4.97	5.01	5.06	5.2	5.2	5.24
9	5.45	5.45	5.62	5.89	5.98	6.03	6.16	6.21	6.26	6.31

	SUM	NUMBER	MIN	MAX	MEAN	STAND.DEV.
TOTAL >	237.64	99	.68	6.31	2.4	1.75
*EDIT >	7.89	9	.8	.96	.88	.06

% R E F L E C T A N C E



% R E F L E C T A N C E * * EDITED * *

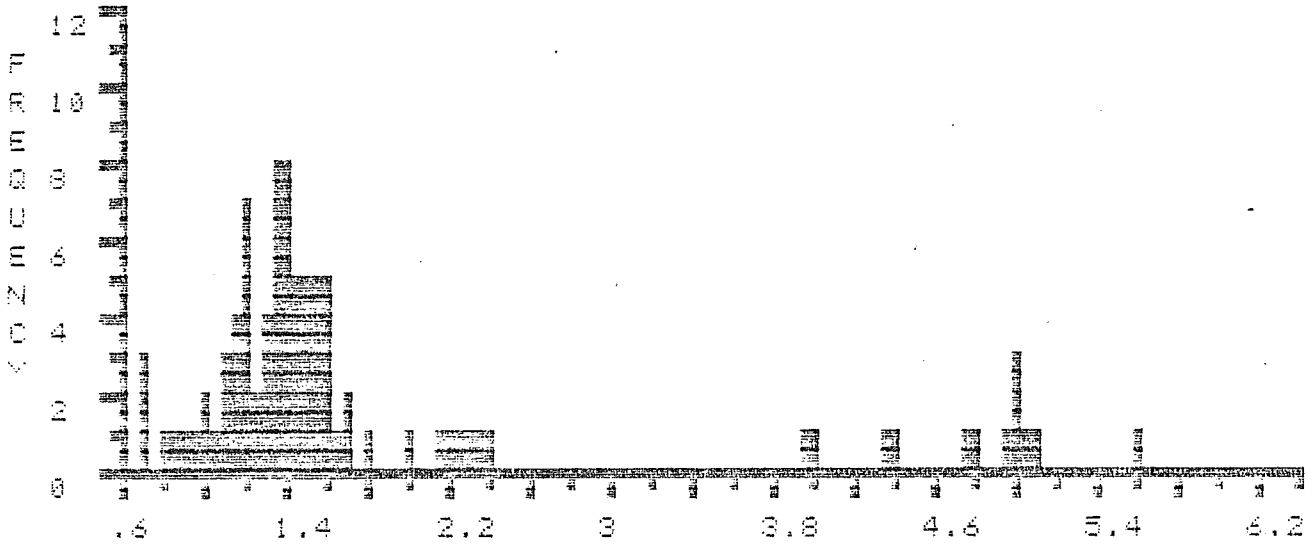


FILE >> K85:1A DESCRIPTION FOLLOWS :
DEPTH 5970-5980M, BLUE H-28, MIKE AVERY, DEC-7-85

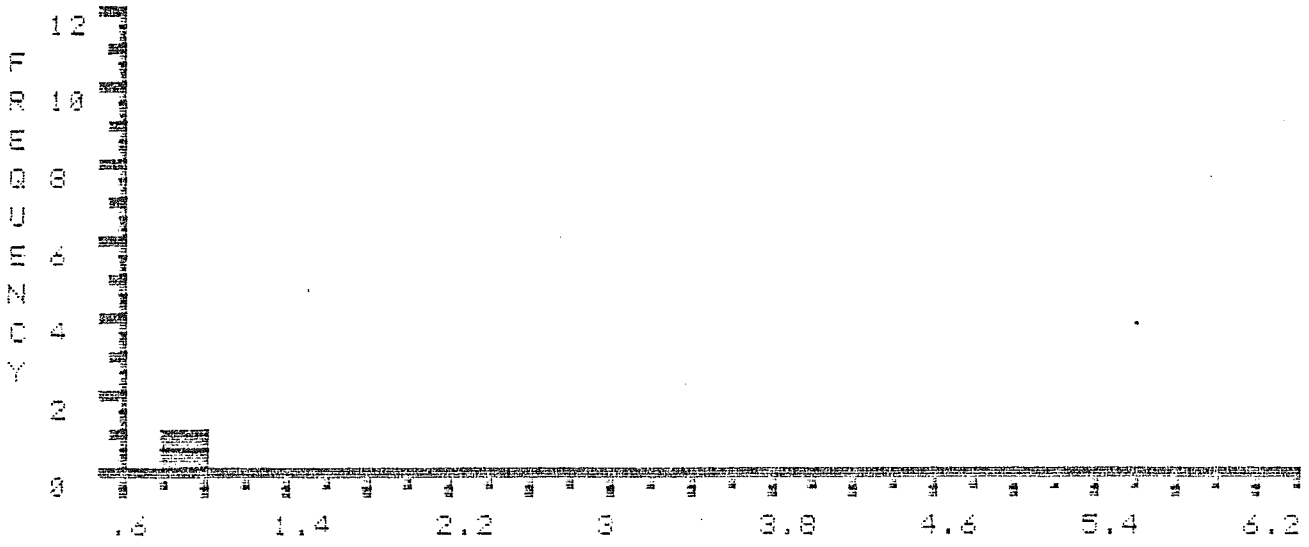
COL>	0	1	2	3	4	5	6	7	8	9
ROW		.72	.74	.74	*.84	*.87	*.92	*.96	1	1.02
1	1.06	1.12	1.13	1.14	1.16	1.18	1.18	1.19	1.2	1.21
2	1.22	1.22	1.24	1.24	1.24	1.26	1.27	1.3	1.3	1.32
3	1.33	1.37	1.37	1.37	1.37	1.38	1.38	1.38	1.39	1.41
4	1.42	1.42	1.43	1.43	1.43	1.44	1.45	1.46	1.46	1.47
5	1.49	1.5	1.52	1.52	1.55	1.55	1.56	1.56	1.58	1.61
6	1.66	1.71	1.72	1.84	2.02	2.17	2.27	2.39	3.99	4.38
7	4.78	4.96	5.01	5.03	5.04	5.05	5.63			

	SUM	NUMBER	MIN	MAX	MEAN	STAND.DEV.
TOTAL >	135.24	76	.72	5.63	1.78	1.19
*EDIT >	3.59	4	.84	.96	.9	.05

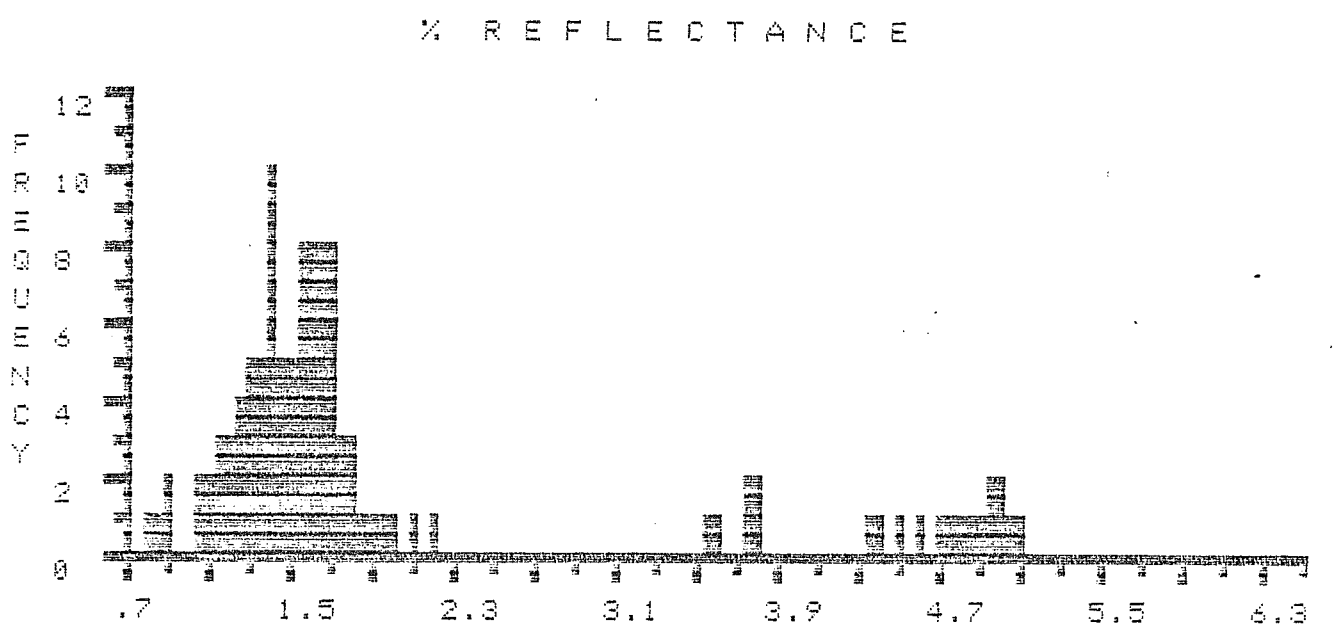
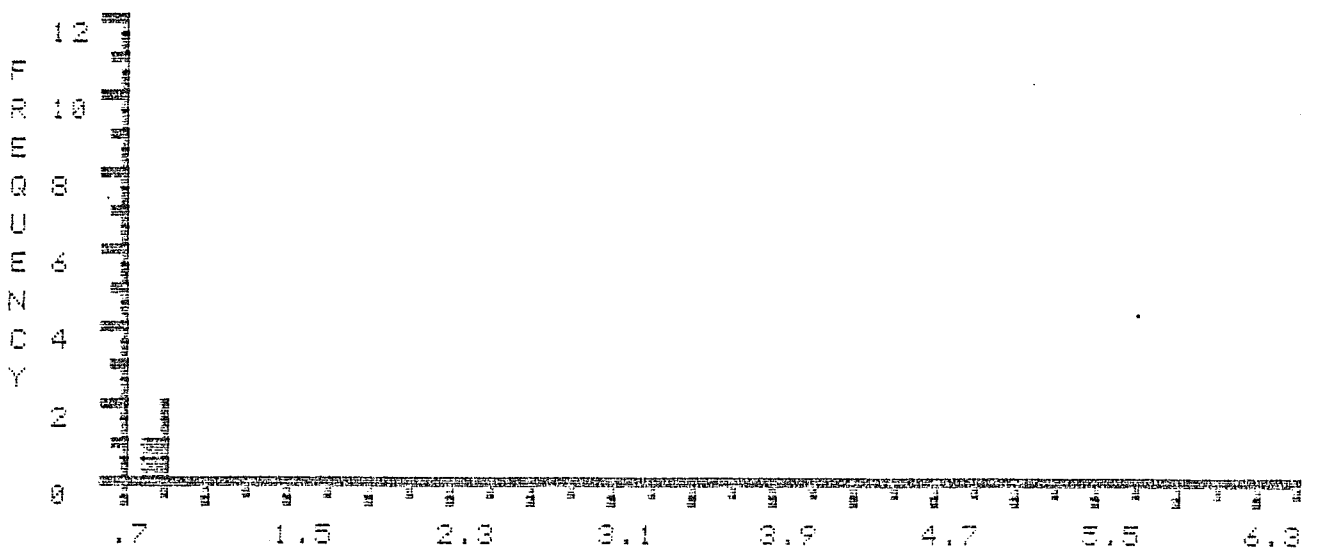
% R E F L E C T A N C E



% R E F L E C T A N C E * * EDITED * *



FILE >> K0561B DESCRIPTION FOLLOWS :
DEPTH 6090-6100M, BLUE H-28, MIKE AVERY, DEC-7-85

COL>	0	1	2	3	4	5	6	7	8	9
ROW		*.84	*.88	*.91	*.94	1.06	1.08	1.16	1.18	1.19
1	1.23	1.24	1.25	1.27	1.28	1.29	1.31	1.32	1.33	1.33
2	1.34	1.35	1.37	1.38	1.38	1.39	1.4	1.4	1.41	1.42
3	1.43	1.43	1.44	1.44	1.44	1.44	1.45	1.47	1.47	1.47
4	1.48	1.5	1.51	1.54	1.54	1.55	1.56	1.57	1.57	1.57
5	1.57	1.58	1.59	1.61	1.62	1.62	1.65	1.66	1.66	1.66
6	1.67	1.69	1.69	1.69	1.72	1.72	1.74	1.76	1.76	1.77
7	1.8	1.82	1.83	1.86	1.93	1.95	2.12	2.22	3.59	3.77
8	3.79	4.35	4.54	4.6	4.7	4.78	4.86	4.96	4.97	5.07

	SUM	NUMBER	MIN	MAX	MEAN	STAND.DEV.
TOTAL >	168.74	89	.84	5.07	1.9	1.08
*EDIT >	3.57	4	.84	.94	.89	.04